Tephrochronology Results for the Grouse Creek and East Part of the Jackpot 30′ x 60′ Quadrangles and Vicinity, Utah, Idaho, and Nevada

by

Michael E. Perkins

Geological Consultant
2025 E. White Circle, Salt Lake City, UT 84109

Bibliographic citation for this data report:

Perkins, M.E., 2014, Tephrochronology results for the Grouse Creek and east part of the Jackpot 30′ x 60′ quadrangles and vicinity, Utah, Idaho, and Nevada: Utah Geological Survey Open-File Report 630, 23 p., also available online, <http://geology.utah.gov/online/ofr/ofr-630.pdf.>.

OPEN-FILE REPORT 630
UTAH GEOLOGICAL SURVEY
a division of
Utah Department of Natural Resources
2014

INTRODUCTION

This open-file report makes available age interpretations and raw analytical data from laboratory procedures completed to determine the age of tephra samples collected in conjunction with geologic mapping funded by the Utah Geological Survey (UGS) and U.S. Geological Survey (USGS) (Miller and others, 2012; Miller and others, in preparation a; Miller and others, in preparation b). Tables 1 and 2 summarize the ages of the samples obtained from the Salt Lake Formation and provide additional information such as sample location and geochemical content. Perkins (1998), Perkins and others (1995, 1998), and Perkins and Nash (2002) explain the geologic setting of these rocks, the significance of the Miocene ages of the tephra, and how they relate to the tectonic evolution of the western United States. These data are highly technical in nature and proper interpretation requires considerable training in the applicable geochronologic techniques.

METHODS

Three hundred and thirty-four (334) samples of vitric tuffs (tephra) were collected during this study. Most samples were collected by the author in the 1990s and during the period 2009–2011. A smaller subset of the samples was collected by USGS and UGS geologists. Samples were typically collected from stratigraphic sections, but individual samples were also collected from small, isolated outcrops. Generally, ~500 cm^3 of material was collected for each sample.

Selected samples were prepared using the methods described by Perkins and others (1995, p. 1486). Glass shards were analyzed by electron probe microanalysis (EPMA) on a Cameca SX-50 at the University of Utah under analytical conditions described by Nash (1992). The microprobe was used to measure Si, Ti, Al, Fe, Mn, Mg, Ca, Ba, Na, K, Cl, F, and O in weight percent. Typically, 20 glass shards per sample were analyzed. Estimates of the H_2O content in the hydrated glass shards were calculated from the difference between measured and stoichiometric oxygen content as discussed by Nash (1992).

The basic approach is to correlate tuff beds by their glass shard composition, and, where feasible, to confirm correlations between unfaulted stratigraphic sections (see Sarna-Wojcicki and Davis, 1991). Tuff beds identified in this study are correlated between the principal and ancillary sections and to named tuffs within a source area (in this case the Trapper Creek, Idaho, section just south of the Snake River Plain). The University of Utah has developed an extensive database of glass shard geochemical data for these tuff beds (3258 samples as of March 2014), and has calibrated the database with $^{40}Ar/^{39}Ar$ analyses of sanidine crystals from several key tuff beds (see Perkins and others, 1998). These database samples span the Neogene (0–17 Ma) and were collected from localities throughout the Intermountain West and Great Plains. The statistical method for the correlation of tuff beds is discussed in Perkins and others (1995, appendix B).

While all 13 elements are analyzed for most samples (Ba and O were not analyzed in several samples) only six elements are useful in sample correlations. These elements are Ti, Fe, Mn, Mg, Ca, and Cl. Of these six elements Fe, Mg, Ca, and Cl have the highest precision. Elements Si, Al, and O vary little within analytical precision and are ignored for this reason. Elements Na and K are not useful as they have exchanged with groundwater Na and K and, thus, do not represent their original values.

TEPHRA CORRELATION

Statistical Comparison of Tephra

Tephra samples can have either a single compositional mode or include two or more modes. The shards in single-mode tephra can either have a common composition, within analytical error, or a compositional range. There are 93 samples with a single compositional mode, listed as either “uni” or “R”. The “uni” samples are tightly clustered while the “R” modes show a range of values. Samples that have multiple modes generally have a strong primary mode (≥80% of the shards) with up to three secondary modes. In samples with two or more modes, the modes with a single composition are labeled with Roman numerals (I, II, etc.). If two or more such modes have the same number of shards they are labeled Ia, Ib or IIa, IIb, etc. Modes with a compositional range are labeled R1, R2, etc. If two or more ranges have the same number of shards the

labeling is R1a, R1b, or R2a, R2b, etc. Both the number of shards in a sample and the number of shards in each mode are listed in the column "Shards" and the column "Modes", respectively.

The listing of samples in table 2 is not arbitrary. In general, the concentration of Fe in the samples increases downward. For comparative purposes, the "statistical distance" is also given for each sample. This distance is listed in the column "***D***" defined as the square root of $\boldsymbol{D^2}$ shown below:

$$D^2 = \sum_{e=1}^{6} \left\{ \frac{(C_s - C_{s+1})_e^2}{2\sigma_e^2} \right\}$$

Here, $\boldsymbol{C_s}$ and $\boldsymbol{C_{s+1}}$ are the concentrations in the primary mode in sample "$\boldsymbol{s+1}$" and the overlying sample "$\boldsymbol{s}$" over all six elements "$\boldsymbol{e}$". Statistically, adjacent sample pairs are considered compositionally "identical" if $\boldsymbol{D \leq 3.5}$ for the primary mode at the $\boldsymbol{2\sigma}$ level. For strongly multimodal samples, ***D*** is measured by the distance the pattern of analyses of one sample needs to be shifted to overlay another sample.

If two or more samples fall within the 2σ range, they are generally given a name. Names that are queried indicate the identity of the correlation is uncertain. Some of the tephra names are based on the name of a correlative ash-flow tuff, while others are named for a nearby geographic feature. But a number of tephras have no known correlative ash-flow tuff and no nearby geographic feature. A group of such correlative tephras is assigned the name of one of the sample labels in the group or the name of a correlative tephra from a locality beyond the Grouse Creek study area.

TEPHRA AGES

Analyses of tephra samples collected in this study were compared to analyzed tephra in the University of Utah tephra database. This database consists of tephra sampled and analyzed in 33 sections located throughout the Intermountain West (figure 1). Of particular importance to this study is the Trapper Creek section located just northwest of the Grouse Creek study area. Nine $^{40}Ar/^{39}Ar$ ages and two K/Ar ages have been determined for this section (Perkins and others, 1995; Perkins and others, 1998). In addition, three other tephras in the Trapper Creek section correlate to tephra with $^{40}Ar/^{39}Ar$ ages. These ages are highlighted in red in table 2.

With these 12 $^{40}Ar/^{39}$ ages, the ages of other tephra in measured sections can be estimated by interpolation or, more rarely, extrapolation from age pairs above or below a given tephra in a stratigraphic section. All these ages are listed in table 2. Analyses of tephra samples from this study were compared to the University of Utah database, and no additional radiometric age analyses were conducted. Correlations of some of the samples are uncertain. The samples are queried if the correlation is uncertain.

RESULTS

Correlations

The tephra correlations for the Grouse Creek and east part of the Jackpot 30′ x 60′ quadrangles and some adjacent areas are summarized in table 1 and discussed below. The microprobe analytical data are given in table 3. Ages for this data set range from 6.35 to 15.93 Ma (table 2). The youngest is the Walcott tephra and the oldest is likely the Sheep Creek 3 tephra.

Tephra sample ID's are on the left side of table 2, along with the number of shards analyzed for each sample (column "n"). These are followed by the mean values of the 13 elements analyzed on the electron microprobe. The elements used in correlations are color-coded in either red (for Fe) or blue (for the other color-coded elements). The other elements, in particular K and Na, are not the initial concentrations for these two elements, since the concentrations of these two elements are altered by post-depositional exchange with groundwater.

The rows of analyses in table 2 are color coded. The coding is as follows: either green or blue for two or more adjacent samples from the same tephra, or gray or white for single samples. Adjacent rows with the same color highlight analyses that are considered to be samples from a particular tephra. The other tephra, coded gray or white, have no correlatives in the University of Utah tephra database.

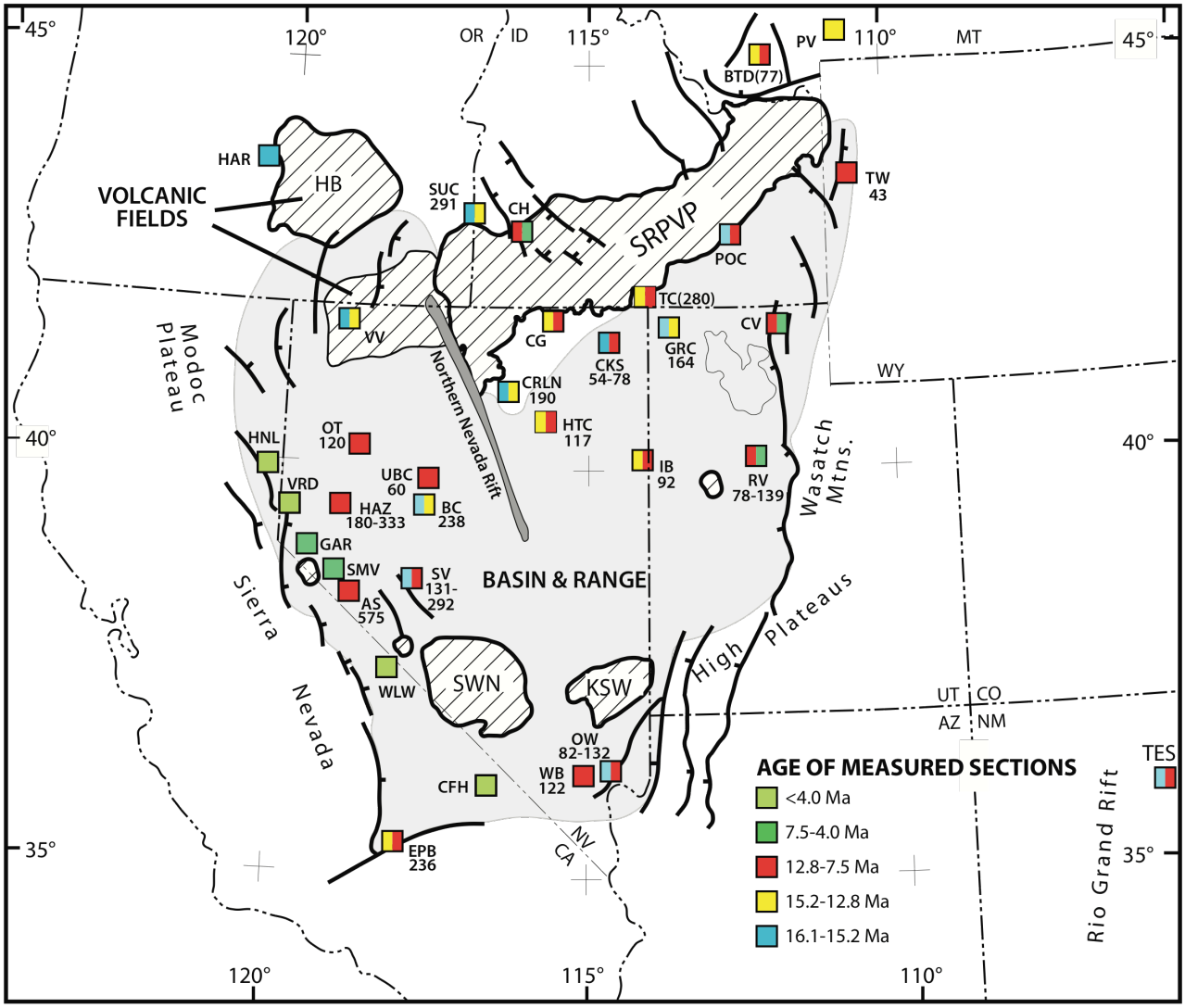


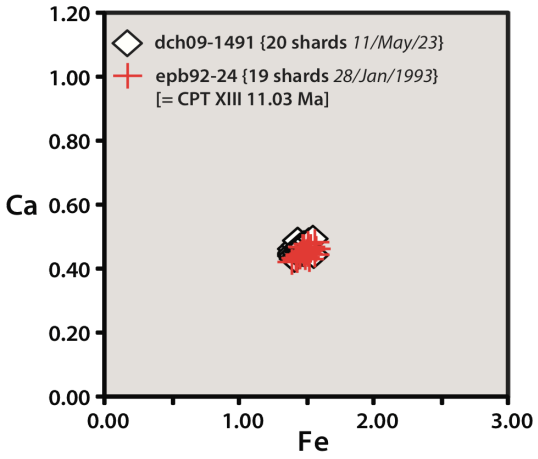
Figure 1. *Sections of Tertiary strata in the Basin and Range Province.*

Section ID (Name): AS (Aldrich Station), BC (Buffalo Canyon), BTD (Blacktail Deer Creek), CFH (Confidence Hills), CG (Cedar Gulch), CH (Chalk Hills), CKS (Chalk Springs), CRLN (Carlin), CV (Cache Valley), EPB (El Paso basin), GAR (Gardnerville), GRC (Grouse Creek), HAR (Harney Basin), HAZ (Hazen), HNL (Honey Lake), HTC (Huntington Creek), IB (Ibapah Badlands), OT (One Tip), OW (Overton Wash), POC (Pocatello), PV (Pahranagat Valley), RV (Rush Valley), SMV (Smith Valley), SUC (Succor Creek), SV (Stewart Valley), TC (Trapper Creek), TES (Tesutue), TW (Teewinot), UBC (Upper Buffalo Canyon), VRD (Verdi), VV (Virgin Valley and Thousand Creek), WB (White Basin), WLW (Willow Wash). Silicic volcanic centers: HB (Harney Basin), KSW (Kane Spring Wash), LW (Little Walker), OV (Orevada), SRPVP (Snake River Plain volcanic province), SWN (southwestern Nevada), TR (Thomas Range). Numbers by selected sections refer to sedimentation rates in meters/Ma.

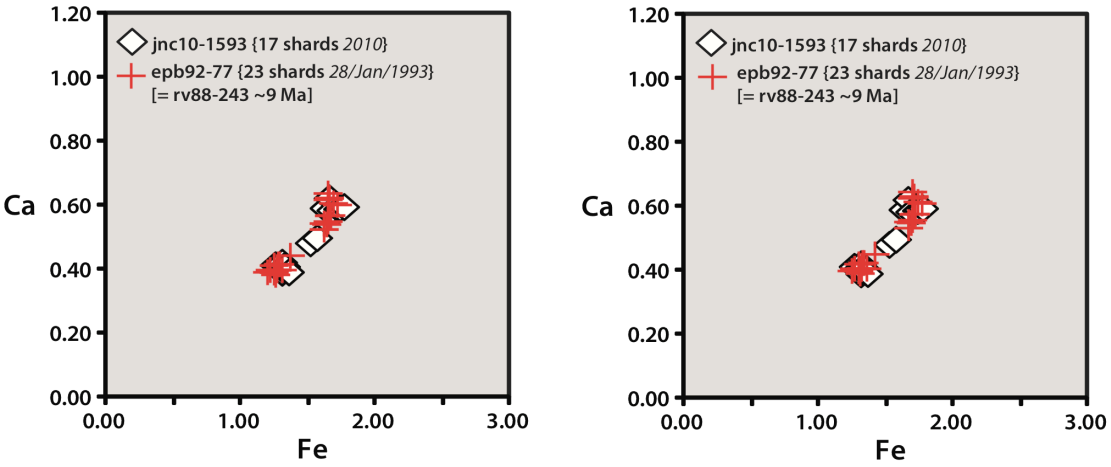
Validity of Correlations

Tephra correlations are based on two factors: (1) analyses of glass shards separated from tephra samples and (2) the stratigraphic context of the tephra. As noted in the section "Analytical Techniques" ~20 shards per sample were analyzed with a Cameca SX-50 electron microprobe. It is these analyses that allow a first estimate of likely correlations between tephra pairs using pattern matching.

Two examples of pattern matching of glass shard compositions between sample pairs are shown in figure 2. The first (upper) example shows the comparison of two unimodal samples. One sample, dch09-1491, is from the study area. This sample is from an isolated outcrop in a roadbed at the southern end of the Dove Creek Hills. Thus, there is no information on the



Sample	n	Si	Ti	Al	Fe	Mn	Mg	Ca	Ba	K	Na	Cl	F	O	D
dch09-1491	20	34.22	.127	5.96	1.44	.028	.020	.463	.048	4.60	1.65	.041	.205	51.60	- - -
epb92-24	19	33.97	.124	6.03	1.48	.027	.020	.453	.031	3.32	1.93	.040	.084	52.73	1.8



Sample	n	Si	Ti	Al	Fe	Mn	Mg	Ca	Ba	K	Na	Cl	F	O	D
jnc10-1593	17	33.18	.159	5.99	1.48	.028	.068	.483	.075	5.78	1.39	.034	.198	49.75	- - -
epb92-77	23	33.32	.164	5.93	1.47	.026	.056	.499	.100	5.42	1.43	.031	.166	49.74	5.0

Figure 2. *Unimodal and multimodal tephra comparisons. Data in weight percent.*

identity or age of this sample within the study area. The other sample, epb92-24, is from a measured section (El Paso Basin section; Perkins and others, 1998) 800 km south-southwest of the study area and just north of the Garlock fault in southern California. The statistical distance function ***D*** value between these two tephras is 1.8, i.e., well within the $1\sigma = 3.5$ level.

Sample epb92-24 is also a statistical match to basal ashfall in the sequence of Cougar Point welded tuffs exposed in their type area along the east canyon wall of the Bruneau River in south-central Idaho (see Bonnichsen and Citron, 1982). In particular it is a match to the 11.03 Ma Cougar Point Tuff, unit XIII). Besides its recognition in the type area at Trapper Creek, ID, it is also present in northeastern Nevada, western Nevada, and the El Paso Basin (Perkins and others, 1998) and several localities in Nebraska. In all the areas in the western U.S. (excepting the dch09-1491 locality) CPT XIII is in measured sections and lies in its proper stratigraphic position relative to tephra above and below it. Thus, the correlation is well established.

The second (lower) graph in figure 2 compares the pattern of glass shard analyses of sample jnc10-1593 with another sample in the El Paso Basin, namely epb92-77. Sample jnc10-1593 was collected from an isolated outcrop in the northeastern corner of the Grouse Creek 30′ x 60′ quadrangle. It is a tri-modal tephra with two strong primary modes and a minor secondary mode. Sample epb92-77, a bimodal tephra, matches the same two strong modes in sample jnc10-1593 and is correlated to sample jnc10-1593 on this basis. This same tephra is also recognized in the Chalk Springs, Nevada section CKS2 ~90 km west-southwest of jnc10-1593, along the south side of the Snake River Plain in southwestern Idaho, and at a locality ~1100 km east-southeast of sample jnc10-1593.

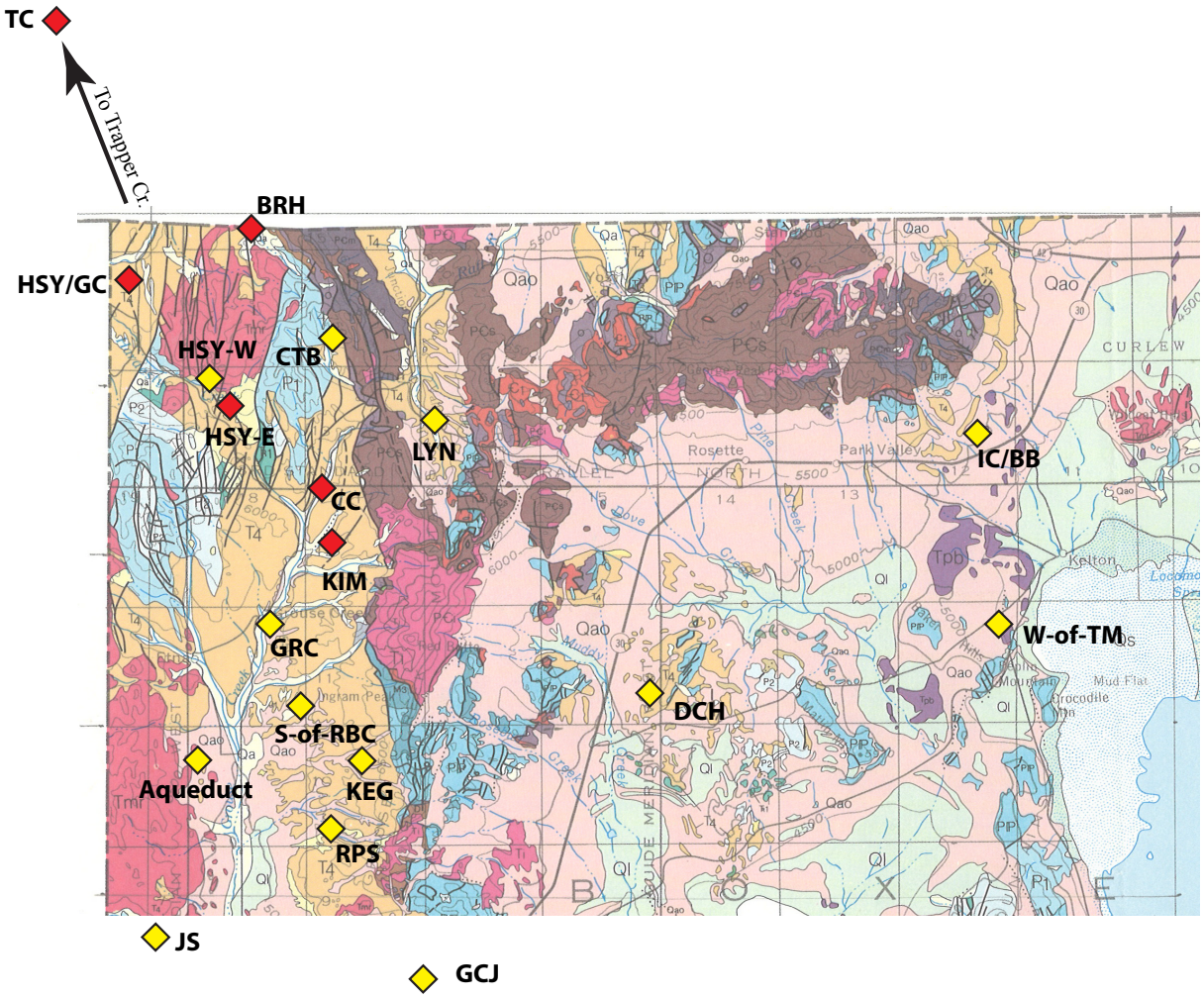


Figure 3. *Generalized geologic map and section locations in the Grouse Creek and east part of the Jackpot 30′ x 60′ quadrangles. Locations highlighted in red have measured sections. Section ID (Name): TC (Trapper Creek), HSY/GC (Hardesty/Goose Creek), BRH (Birch Creek), HSY-W (Hardesty Creek West),HSY-E (Hardesty Creek East), CTB (Cotton Thomas Basin), LYN (Lynn), CC (Cotton Creek), KIM (Kimball), GRC (Grouse Creek), S-of-RBC (South of Red Butte Creek), KEG (Keg Spring), Aqueduct, RPS (Rocky Pass Spring), JS (Jackson Spring), GCJ (Grouse Creek Junction), DCH (Dove Creek Hills), W-of-TM (West of Table Mountain), IC/BB (Indian Creek/Black Butte). Geologic map is from Hintze (1980).*

Sedimentation Rates

The age estimates provide constraints on sediment accumulation rates of the Miocene basin fill. Five sections with two or more dated tephras are available for estimating sedimentation rates in the Grouse Creek 30′ x 60′ quadrangle. In addition, the sedimentation rate in the nearby Trapper Creek section has been measured as well (Perkins and others, 1995). The rates in these measured sections are as follows (see figure 3 for locations):

1. Hardesty Creek East (HSY-E; N41.85700°, W113.92100°; ~90 m/Ma)

2. Cotton Creek (CC; N41.79614°, W113.83055°; ~160 m/Ma)

3. Kimball (KIM; N41.74799°, W113.79801°; ~90 m/Ma)

4. Hardesty/Goose Creek (HSY/GC; N41.925280°, W114.03793°; 130 m/Ma)

5. Birch Creek (BRH; N41.99463°, W113.90827°; ~60 m/Ma)

6. Trapper Creek (TC; N42.13282°, W114.07957°; ~250 m/Ma)

Thus the average sedimentation rate for this local area is 130 ± 68 m/Ma. To the south and southwest of the Grouse Creek area in the main part of the Basin and Range Province, the sedimentation rates are about 40% higher at an average of 181 ± 114 m/Ma (figure 1). This latter rate estimate is based on 19 sections reported in published and unpublished data (Perkins and others, 1995, 1998; M.E. Perkins, unpublished data, 2014). The 19 sections with sedimentation rates include (see figure 1 for locations):

AS – Aldrich Station
BC – Buffalo Canyon
BTD – Blacktail Deer Creek
CKS – Chalk Springs
CRLN – Carlin
EPB – El Paso Basin
IB – Ibapah Badlands
GRC – Grouse Creek
HAZ – Hazen
HTC – Huntington Creek
OT – One Tip
OW – Overton Wash
RV – Rush Valley
SUC – Succor Creek
SV – Stewart Valley
TC – Trapper Creek
TW – Teewinot
UBC – Upper Buffalo Canyon
WB – White Basin

There are not enough measured sections in the Grouse Creek 30′ x 60′ quadrangle area to test whether or not there is a significant difference in the sedimentation rates for the Grouse Creek–Trapper Creek area versus the main part of the Basin and Range Province.

Utility of Tephra for Geologic Mapping

The tephra provide key information for understanding the relationship of the basin fills across the Grouse Creek 30′ x 60′ quadrangle area. As seen in table 1 below, there are 17 dated tephras identified in two or more areas across the quadrangle. These tephras provide key time lines across the area. With these time lines, comparisons can be made on the nature of deposition from area to area. Additionally, the six measured sections, listed above, provide evidence of possible variation in subsidence rates from area to area in the quadrangle. This type of information could be overlain on the geologic map of the quadrangle and enhance the utility of the map. Without information on tephra ages and thickness of measured sections, much less would be known about the Salt Lake Formation in the study area.

SUMMARY

Compared to the 1:500,000 Utah state geologic map (Hintze, 1980), the 1:62,500 geologic map of the Grouse Creek and east part of the Jackpot 30′ x 60′ quadrangles provides improved documentation of the distribution of geologic units, locations of faults, and the attitude of layered units within the map area. Additional information is provided by this report on the age of the abundant tephra layers in the Salt Lake Formation, as well as preliminary information on rates of sediment accumulation within the map area.

Table 1. *Summary of tephra ages in two or more areas of the Grouse Creek and east part of the Jackpot 30′ x 60′ quadrangles.*

Tephra Name	Ma
Faust	7.57
Rush Valley	8.39
gc96-949	~9
gc96-972	~9
Hazen	9.8
Cougar Point XVb?	10.6
swt96-945	~11
Cougar Point XIII	11.03
cks95-746b	11.25
Cougar Point XI	11.37
Cougar Point IX	11.71
Ibex Peak 8	11.9
White Basin	12.2
Petroglyph	12.5
Cougar Point III	12.83
sv92-62	13.7
Obliterator	14.84

DISCLAIMER

This open-file release is intended as a data repository for information gathered in support of various UGS projects. The data are presented as received from the author and do not necessarily conform to UGS technical, editorial, or policy standards; this should be considered by an individual or group planning to take action based on the contents of this report. The Utah Department of Natural Resources, Utah Geological Survey, makes no warranty, expressed or implied, regarding the suitability of this product for a particular use. The Utah Department of Natural Resources, Utah Geological Survey, shall not be liable under any circumstances for any direct, indirect, special, incidental, or consequential damages with respect to claims by users of this product.

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Table 2. *List of principal glass shard modes of tephra analyzed for the Grouse Creek and east part of the Jackpot 30' x 60' quadrangles and vicinity, Utah, Idaho, and Nevada.*

			Stdev	.266	.007	.038	.013	.003	.003	.012	.017	.406	.145	.003	.031	.114						
Sample ID	**LatNAD83**	**LongNAD83**	**No. of Shards**	Si	Ti	Al	Fe	Mn	Mg	Ca	Ba	K	Na	Cl	F	O	**D**	**Modes**	**Tephra ID**	**Tephra Name**	**Age**	**1σ**
M10GC-328	41.554608	-113.386469	3	32.41	.132	6.28	0.95	.036	.113	.851	.138	5.06	1.06	.085	.080	49.88		I(2), II(1)	**M10GC-328**	**M10GC-328**	x	x
js09-1453	41.46978	-113.98528	18	34.06	.032	6.30	0.73	.018	.007	.391	.004	5.16	1.90	.112	.034	51.51	40.8	uni	**i88- 86**	**i88- 86**	**12.3**	**0.02**
grc09-1456	41.531272	-113.998912	19	34.47	.032	6.40	0.77	.022	.008	.416	.013	4.42	2.43	.128	.003	51.52	4.6	uni	**btd95-830**	**btd95-830**	**9.9**	**0.04**
grc10-1584	41.77387	-113.85449	12	34.13	.037	6.38	0.75	.014	.013	.390	.000	4.56	2.49	.149	.408	50.64	5.9	uni	**grc10-1584**	**grc10-1584**	x	x
grc96-975	41.79633	-113.82995	19	34.06	.054	6.23	0.68	.027	.031	.319	.019	5.10	1.31	.081	.080	51.26	18.1	uni	**grc96-975**	**grc96-975**	**15.6**	x
grc09-1494	41.440375	-113.737937	19	34.19	.042	6.16	0.68	.045	.030	.255	.000	4.73	2.39	.100	.179	50.45	7.4	uni	**grc09-1494**	**grc09-1494**	x	x
dch09-1446	41.638514	-113.518914	2	34.17	.083	6.39	0.82	.034	.050	.452	.048	4.62	2.10	.105	.071	51.29	15.7	I(2), IIa(1), IIb(1)	**dch09-1446**	**dch09-1446**	x	x
usu88-6	41.86681	-113.17326	19	34.22	.116	6.02	0.83	.029	.047	.314	.095	4.79	1.93	.104	.186	49.88	9.1	uni	**WAL**	**Walcott**	**6.35**	**0.04**
usu88-8	41.858562	-113.172985	21	34.15	.116	6.03	0.84	.035	.049	.315	.094	4.60	2.03	.102	.197	50.03	1.5	uni	"	"	"	"
jnc09-1450	41.84849	-113.72346	19	34.38	.116	6.03	0.86	.049	.046	.295	**.024**	4.64	2.09	.099	.147	52.03	3.9	uni	**BTC**	**Blacktail Deer Creek**	**6.69**	**0.03**
jnc09-1449	41.84849	-113.72346	17	34.48	.110	6.05	0.86	.040	.045	.293	**.022**	4.41	2.16	.102	.133	52.53	2.3	uni	"	"	"	"
js09-1454	41.47007	-113.98406	17	34.47	.047	6.42	0.91	.019	.012	.412	.004	4.20	2.61	.092	.135	51.64	13.6	I(17), II(1)	**js09-1454**	**x**	x	x
brh09-1550	41.9946	-113.90694	17	34.27	.084	6.21	0.89	.018	.019	.405	.022	5.24	1.88	.063	.207	49.47	8.0	uni	**brh09-1550**	**x**	x	x
IO11-12	41.581289	-113.713561	20	33.89	.111	5.92	0.90	.018	.042	.305	.006	4.84	1.89	.072	.000	49.45	8.9	uni	**FST**	**Faust**	**7.57**	**0.04**
grc09-1518	41.645781	-113.849289	18	34.49	.110	6.10	0.94	.025	.048	.327	.007	5.30	1.69	.074	.164	50.56	3.1	uni	"	"	"	"
099F09GC	41.705823	-113.170868	20	34.46	.120	6.04	0.94	.027	.049	.331	.005	5.15	1.67	.071	.159	51.69	1.4	R	"	"	"	"
M10GC-424	41.726025	-114.024197	13	32.96	.102	5.94	0.93	.016	.040	.354	.003	6.01	0.84	.074	.054	49.29	4.1	uni	**RWR**	**Rawhide Ranch**	**13.9**	**0.04**
vos10-1598	41.961842	-113.554948	19	33.83	.100	6.06	0.98	.015	.050	**.373**	.019	5.43	1.74	.079	.272	50.17	4.1	uni	***III?***	***Cougar Point III?***	***12.83***	***0.03***
RPS 73-54	41.439276	-113.731115	4	34.01	.102	6.13	0.95	.025	.027	.370	.000	5.75	1.35	.070	.200	50.29	6.2	uni	**III**	**Cougar Point III**	**12.83**	**0.03**
RPS 73-51	41.439276	-113.731115	22	33.99	.087	6.14	0.98	.016	.032	.373	.004	5.63	1.39	.072	.194	50.30	3.0	uni	"	"	"	"
brh09-1552	41.99481	-113.90755	20	34.01	.084	6.00	0.98	.021	.026	.368	.002	5.81	1.37	.075	.230	50.10	2.0	uni	"	"	"	"
grc10-1606	41.748343	-113.79664	20	32.82	.096	5.82	0.98	.019	.038	.361	.007	6.01	1.07	.070	.000	49.80	3.4	uni	"	"	"	"
RPS 73-52	41.439276	-113.731115	23	34.09	.084	6.17	0.99	.020	.037	.372	.000	5.55	1.42	.072	.193	50.44	1.6	uni	"	"	"	"
gc09-1460	41.89966	-114.00801	20	33.70	.095	5.98	1.00	.022	.034	.374	.006	6.14	0.54	.071	.058	52.79	1.5	uni	"	"	"	"
RPS 73-49	41.439276	-113.731115	17	34.14	.091	6.18	1.01	.024	.034	.372	.004	5.53	1.45	.071	.191	50.81	0.8	uni	"	"	"	"
hsy09-1542	41.876816	-113.921277	20	34.38	.087	6.10	1.03	.023	.035	.367	.004	5.60	1.46	.072	.222	50.62	1.4	uni	"	"	"	"
grc10-1601	41.731096	-113.959154	19	33.48	.094	5.93	1.01	.018	.032	.346	.008	5.72	1.38	**.066**	.000	49.58	2.6	uni	"	"	"	"
grc10-1600	41.726199	-113.960752	18	33.48	.091	5.94	1.01	.014	.031	.351	.002	5.76	1.34	**.066**	.000	49.85	1.2	uni	"	"	"	"
RPS 73-50	41.439276	-113.731115	19	33.96	.091	6.14	1.02	.021	.036	.372	.000	5.57	1.38	**.064**	.211	50.26	2.5	uni	"	"	"	"
hsy09-1537	41.858347	-113.921905	20	34.21	.103	6.10	1.06	.017	.036	.374	.006	5.44	1.56	**.067**	.191	50.71	3.2	uni	"	"	"	"
grc09-1467	41.758965	-113.830311	19	33.89	.089	6.04	1.12	.020	.024	.355	.008	4.91	1.88	.074	.173	50.64	4.9	uni	**i92-179**	**i92-179**	**13.0**	**0.03**
grc09-1477	41.71006	-113.88066	20	33.82	.119	6.03	1.15	.018	.038	.369	.008	5.86	1.38	.064	.194	50.59	5.3	uni	**tc90-39?**	**tc90-39?**	**14.1**	**0.03**
vos10-1582	41.982478	-113.534367	19	33.61	.096	6.02	1.16	.021	.035	.362	.000	6.25	1.03	.060	.292	51.01	2.8	uni	**or MM1?**	**or MM1?**	**9.28**	**0.04**
F10-071GC	41.687388	-113.16508	18	33.80	.171	6.04	0.97	.042	.083	.370	.006	4.23	2.21	.111	.000	50.19	21.3	R1(18), II(1)	**F10-071GC**	**F10-071GC**	x	x
grc09-1466	41.758042	-113.831443	7	33.51	.146	6.24	1.33	.026	.077	.614	.065	4.36	1.95	.058	.102	50.63	28.0	I(7), II(1)	**grc09-1466**	**grc09-1466**	x	x
grc09-1458	41.597746	-113.946657	20	33.89	.152	5.89	1.07	.020	.054	.395	.021	5.53	1.42	.037	.152	51.73	20.7	uni	**tc89-16a**	**tc89-16a**	**12.5**	**0.02**
brh09-1481	41.973534	-113.878546	17	34.13	.169	5.99	1.12	.014	.056	.399	.021	5.30	1.51	.026	.172	51.72	4.4	I(17), II(1)	**WB**	**White Basin**	**12.2**	**0.02**
F10-255GC	41.545327	-114.005602	19	33.40	.153	5.85	1.13	.016	.054	.391	.008	4.99	1.72	.030	.000	50.22	2.1	uni	"	"	"	"
hsy09-1539	41.85701	-113.918	20	34.41	.168	6.01	1.13	.022	.054	.397	.027	5.33	1.51	.031	.181	50.72	2.1	uni	"	"	"	"
RPS 73-46	41.439276	-113.73115	21	33.92	.137	6.11	1.13	.021	.055	.413	.014	5.16	1.47	.039	.180	51.30	3.7	uni	**PTG**	**Petroglyph**	**12.5**	**0.02**
brh09-1554	41.99463	-113.90827	20	34.23	.146	6.00	1.18	.019	.053	.416	.016	5.83	1.19	.038	.193	51.14	3.2	uni	"	"	"	"
gc96-971	42.077773	-113.92746	12	34.50	.133	6.29	1.18	.026	.062	.368	.029	5.41	1.49	.045	.220	50.84	4.5	I(12), II(8)	**gc96-971**	**gc96-971**	x	x
gc96-970	42.077799	-113.92844	13	34.71	.140	6.32	1.25	.017	.063	.395	.021	5.44	1.63	.035	.280	50.59	5.2	I(13), II(6)	**gc96-970**	**gc96-970**	x	x
hsy09-1522	41.877515	-113.949216	18	33.75	.078	6.09	1.17	.026	.013	.401	.003	6.19	0.84	**.096**	.260	51.01	19.8	uni	**VH3**	**Violets Hollow 3**	**13.99**	**0.04**
hsy09-1527	41.8698	-113.94351	16	33.80	.078	6.05	1.20	.022	.014	.404	.002	6.30	1.07	.088	.257	50.46	2.7	uni	"	"	"	"
hsy09-1520	41.877117	-113.949282	16	33.87	.080	6.09	1.28	.022	.009	.419	.003	6.42	0.77	.088	.219	50.84	5.0	uni	**VH3?**	**Violets Hollow 3?**	"	"
M10GC-482	41.705815	-113.904841	20	33.23	.124	5.93	1.21	.015	.029	.372	.007	6.32	0.97	.053	.000	50.24	11.9	I(20), II(1)	**M10GC-482**	**M10-GC482**	x	x
grc09-1505	41.71499	-113.891144	21	34.63	.124	5.97	1.22	.022	.033	.359	.011	5.69	1.44	.045	.197	50.54	3.0	uni	**htc93-442**	**htc93-442**	**15.2**	**0.04**
grc09-1475	41.75	-113.86	15	33.73	.108	6.02	1.23	.021	.030	.391	.022	4.98	1.72	.049	.188	50.82	2.8	I(15), II(5)	**grc09-1475**	**grc09-1475**	x	x
M10GC-099	41.914773	-113.146662	7	32.75	.108	5.85	1.24	**.036**	**.032**	.345	.032	4.44	1.56	**.055**	.115	50.28	4.7	R1(7), R2(5)	**M10GC-099**	**M10GC-099**	x	x
M10GC-377	41.689587	-113.911572	20	33.16	.135	5.92	1.25	.024	.042	.383	.030	5.14	1.64	.037	.165	49.36	6.6	uni	**IX**	**Cougar Point IX**	**11.71**	**0.04**
dch91-05	41.650732	-113.516804	8	32.39	.140	5.80	1.28	.017	.042	.394	- - -	4.81	0.92	.032	.125	- - -	2.7	uni	"	"	"	"
gc09-1461	41.90244	-114.00949	19	33.64	.141	5.87	1.29	.018	.038	.404	.023	6.14	0.81	.033	.138	52.28	1.3	I(19), II(1)	"	"	"	"
dch91-02	41.650732	-113.516804	10	32.01	.144	5.82	1.28	.024	.044	.391	- - -	4.68	0.98	.031	.125	- - -	2.1	uni	"	"	"	"
grc09-1514	41.593629	-113.793498	20	34.17	.160	6.08	1.31	.026	.043	.409	.014	4.83	1.73	.033	.182	50.71	2.7	uni	"	"	"	"
grc09-1517	41.645218	-113.849828	13	34.15	.151	6.04	1.33	.026	.045	.418	.035	5.22	1.61	.032	.164	50.75	1.5	uni	"	"	"	"
dch91-04	41.650732	-113.516804	9	32.39	.138	6.11	1.31	.028	.047	.416	- - -	4.59	0.97	.029	.122	- - -	2.0	uni	"	"	"	"
dch91-01	41.650732	-113.516804	8	33.02	.141	5.91	1.34	.023	.044	.413	- - -	4.66	0.83	.027	.069	- - -	1.9	uni	"	"	"	"
jnc10-1593 (I)	41.939624	-113.710725	9	33.45	.149	5.90	1.31	.031	**.052**	.406	.045	5.94	1.26	.034	.219	49.79	3.5	I(9), II(6), III(2)	**jnc10-1593**	**jnc10-1593**	x	x
usu88-9	41.89509	-112.55558	10	33.84	**.130**	5.94	1.27	.019	.041	.394	.071	5.04	1.72	.029	.188	50.41	5.1	I(10), II(6), III(4)	**usu88-9**	**usu88-9**	x	x
grc09-1480	41.9058	-113.8178	15	33.76	.179	6.04	1.33	.026	.053	.417	.014	6.03	0.83	.034	.191	51.86	6.9	I(15), II(6)	**brv93-418**	**brv93-418**	**15.0**	**0.09**
gc09-1463	41.90245	-114.00968	12	33.76	.142	5.88	1.35	.017	.033	.424	.031	6.03	0.77	.028	.144	52.25	6.7	I(12), II(7), III(1)	**XVb?**	**Cougar Point XVb?**	**10.6**	**0.01**
grc09-1513	41.601377	-113.809622	12	34.21	.145	6.04	1.38	.022	.038	.423	.046	4.75	1.79	.030	.175	50.45	2.4	I(12), II(8)	"	"	"	"
dch09-1442	41.656634	-113.51316	8	34.14	.135	5.92	1.36	.017	.038	.420	.048	4.27	1.21	.024	.107	52.77	2.2	I(8), II(4), III(2), IV(1)	"	"	"	"
dch09-1444	41.651349	-113.516365	10	33.60	.191	6.03	1.72	.030	.055	.564	.064	4.95	1.53	.029	.159	51.93	22.5	I(10), II(9)	"	"	"	"

F10-282GC	41.723287	-113.216773	20	33.48	**.101**	5.87	1.25	.025	**.022**	**.345**	.006	4.50	1.73	.053	.000	50.54	31.8	uni	RV?	Rush Valley?	8.39	0.24
grc09-1468	41.760163	-113.82927	17	34.01	.115	5.99	1.22	.026	.032	.378	.031	5.11	1.74	.054	.144	50.69	3.8	I(17), IIa(1), IIb(1)	RV	Rush Valley	8.39	0.24
brh09-1510	41.992348	-113.903707	19	33.39	.116	5.87	1.26	.025	.028	.395	.008	5.51	1.48	.047	.000	50.16	3.4	R	"	"	"	"
JO11-13	41.617922	-113.711761	19	33.83	.108	5.92	1.29	.030	.028	.364	.009	4.68	2.03	.049	.000	49.58	2.9	uni	"	"	"	"
rrm09-1485	41.821987	-113.23611	17	34.38	.112	6.01	1.32	.034	.028	.378	.026	4.12	2.16	.051	.188	52.03	1.9	uni	"	"	"	"
093F09GC	41.819559	-113.232129	15	34.43	.110	6.03	1.35	.032	.033	.380	.024	4.20	2.01	.052	.174	51.97	2.3	uni	"	"	"	"
yos10-1580	41.981546	-113.532092	17	33.95	.109	6.03	1.34	.037	**.042**	.367	.010	4.77	2.16	.056	.175	51.50	2.6	R1(17), II(1)	RV?	Rush Valley?	8.39	0.24
RPS 73-21	41.942789	-114.058123	20	33.72	.118	6.06	1.26	.021	.030	.422	.010	5.91	0.94	.040	.145	50.95	8.2	R	XI?	Cougar Point XI?	11.37	0.04
RPS 73-28	41.930526	-114.042239	17	33.74	.116	6.06	1.32	.019	**.020**	**.440**	.033	6.02	1.09	.041	.177	50.42	4.2	R1(17), II(3)	"	"	"	"
M10GC-374	41.68	-113.93	20	33.18	.114	5.90	1.30	.019	.027	.391	.018	5.46	1.50	.045	.128	48.94	3.7	uni	XI	Cougar Point XI	11.37	0.04
grc10-1609	41.697999	-113.961891	18	33.34	**.131**	5.83	1.32	.027	.027	.397	.005	5.93	1.04	.037	.000	50.19	3.4	uni	"	"	"	"
RPS 73-20	41.942473	-114.058472	19	33.61	.122	6.06	1.32	.025	.036	.432	.016	6.03	1.00	.040	.161	50.79	3.1	I(19), II(2)	"	"	"	"
RPS 73-26	41.943669	-114.056018	7	33.94	.113	6.08	1.31	.029	.031	.424	.007	5.80	0.74	.046	.176	51.49	2.2	uni	"	"	"	"
js09-1451	41.46993	-113.98546	17	33.80	.118	5.86	1.33	.029	.026	.419	.014	5.24	0.93	.040	.113	53.15	2.1	uni	"	"	"	"
grc09-1469	41.760528	-113.82935	19	33.75	.121	6.01	1.35	.028	.028	.410	.022	4.78	1.86	.041	.154	50.61	1.7	R	"	"	"	"
brh94-719	42.012107	-113.945475	21	34.25	.124	5.99	1.32	.019	.031	.418	.032	5.62	0.72	.038	.180	51.09	3.2	uni	"	"	"	"
js09-1452	41.46983	-113.98541	15	33.82	.124	5.90	1.33	.022	.025	.413	.019	4.89	0.98	.040	.126	53.17	1.9	I(15), II(5)	"	"	"	"
RPS 73-27	41.940308	-114.050735	12	33.85	.121	6.01	1.38	.024	.019	.451	.032	5.66	1.10	**.044**	.172	50.57	4.1	I(12), IIa(1), IIb(1)	XI?	Cougar Point XI?	11.37	0.04
RPS 73-29	41.930526	-114.042239	12	33.76	.126	6.05	1.40	.026	.022	.461	.014	5.82	1.15	.035	.117	50.58	2.7	R1(12), R2(9)	"	"	"	"
grc09-1476	41.721868	-113.821359	16	33.80	.133	6.09	1.36	.021	.033	.434	.053	4.77	1.87	**.055**	.172	50.83	6.2	R1(16), R2(4)	cks95-746b	cks95-746b	11.25	0.03
hsy09-1544	41.869462	-113.91671	17	34.32	.119	6.05	1.35	.025	.032	.432	.030	5.14	1.66	.054	.197	50.46	1.8	uni	"	"	"	"
brh09-1551	41.9949	-113.90719	16	33.91	.121	6.15	1.37	.027	.034	.425	.010	5.69	1.46	.055	.216	50.77	1.3	R1(16), R2(3)	"	"	"	"
grc09-1511	41.612088	-113.777663	18	34.52	.131	6.09	1.37	.026	.035	.431	.038	4.82	1.90	.050	.177	50.43	1.7	uni	"	"	"	"
gcj91-07	41.43494	-113.76136	8	34.40	.134	6.19	1.38	.023	.036	.418	- - -	5.99	0.75	.047	.117	- - -	1.2	R	"	"	"	"
wch09-1483	41.830548	-113.034344	10	34.00	.129	6.09	1.20	.026	.050	.452	.034	4.81	1.76	.054	.231	51.74	10.5	R1(10), II(3), III(1)	wch09-1483	wch09-1483	x	x
hsy09-1529	41.87008	-113.94314	16	33.78	.136	6.15	1.26	.023	.054	**.480**	.040	5.88	1.25	.056	.196	50.76	4.0	I(16), II(4)	MDC	Middle Creek	11.83	0.01
yos10-1604	41.964047	-113.57629	15	33.43	.187	5.96	1.22	.013	.081	.430	.005	4.52	2.00	.036	.000	50.00	10.4	I(15), II(1)	IKM	Inkom	8.58	0.04
RPS 73-41	41.438096	-113.729275	13	33.87	.164	6.24	1.20	.032	.068	.474	.025	5.23	1.48	.042	.145	50.83	6.6	I(13), R2(7)	RPS 73-41	x	x	x
grc10-1602	41.711697	-113.964347	19	32.92	.173	5.93	1.25	.022	.070	.459	.005	6.10	0.99	.037	.000	49.70	4.1	uni	BH or BND?	Brown's Hill or Banded?	11.7	x
M10GC-088	41.994464	-113.156461	10	33.01	.180	5.82	1.30	.031	.065	.447	.085	4.60	1.80	.044	.137	49.57	4.0	I(10), II(9), III(1)	M10GC-088	x	x	x
grc09-1465	41.757382	-113.83173	18	34.04	.152	5.95	1.35	.024	.048	.443	.070	4.57	1.86	.045	.130	52.03	5.7	uni	grc09-1465	x	x	x
hsy94-715dup	41.96267	-114.01195	21	34.12	.147	5.97	1.36	.023	.051	.442	.111	5.32	1.43	.043	.192	50.67	1.2	I(21), II(5), III(4), IV(1)	hsy94-715	x	x	x
hsy94-715	41.962621	-114.011936	10	34.25	.148	6.02	1.38	.030	.056	**.456**	.133	5.18	1.51	.044	.201	51.42	2.6	I(10), II(6), III(4)	"	x	"	"
grc09-1500	41.552157	-113.810414	20	33.70	.170	6.25	1.38	.022	.068	**.469**	.040	6.36	0.90	.044	.180	50.81	4.1	uni	gc96-972	gc96-972	~9	x
gc96-972	42.077771	-113.92746	6	34.77	.160	6.23	1.36	.026	.067	.442	.059	5.36	1.78	.038	.101	49.85	2.8	uni	"	"	"	"
gc96-972dup	42.077771	-113.92746	20	35.08	.171	6.33	1.38	.026	.066	.446	.074	5.08	1.83	.042	.134	50.14	1.9	uni	"	"	"	"
hsy09-1574	41.86219	-113.944	19	33.75	.168	6.11	1.39	.024	.066	.444	.028	6.12	1.09	.037	.180	51.41	1.5	I(19), II(1)	"	"	"	"
gcj91-05	41.43494	-113.76136	3	33.49	.149	6.26	1.37	.007	.069	.454	- - -	5.80	0.63	.046	.120	- - -	5.1	I(3), II(2), III(1)	gcj91-05	x	x	x
M10GC-449	41.685186	-113.976801	11	33.54	.100	5.92	1.32	.027	.022	.379	.004	5.49	1.58	.073	.000	50.18	15.2	I(11), II(1)	OBL	Obliterator	14.84	0.05
grc09-1504	41.552736	-113.82099	19	34.20	.108	6.02	1.32	.020	.021	.379	.003	6.13	0.94	.069	.198	50.71	1.9	I(19), II(1)	"	"	"	"
hsy09-1535	41.8562	-113.922954	20	33.93	.107	6.05	1.33	.021	.024	.396	.002	5.68	1.44	.070	.229	50.63	1.4	uni	"	"	"	"
grc09-1499	41.550937	-113.817962	20	34.09	.112	6.04	1.35	.026	.022	.393	.004	6.05	1.11	.071	.220	50.79	1.9	uni	"	"	"	"
hsy09-1570	41.860601	-113.955752	19	33.93	.110	6.03	1.39	.030	.025	.401	.005	6.13	1.02	.073	.201	51.15	2.6	I(19), II(1)	"	"	"	"
GCDC-46dup	41.9868	-113.956094	19	33.48	.104	6.01	1.34	.020	.030	.389	.010	5.49	1.33	.080	.255	50.72	4.2	I(19), II(1)	GCDC-46	GCDC-46	~9	x
GCDC-46	41.9868	-113.956094	19	33.47	.106	6.05	1.34	.022	.032	.386	.030	5.71	1.61	.072	.241	50.19	2.1	I(19), II(1)	"	"	"	"
M10GC-373	41.679005	-113.93739	8	32.92	.140	5.90	1.44	.026	.037	.422	.049	5.46	1.48	.032	.002	48.61	11.8	I(8), II(1)	M10GC-373	M10GC-373	x	x
hsy09-1549	41.845246	-113.947191	9	33.64	.151	6.15	1.44	.019	.042	.419	.022	6.25	1.26	**.042**	.156	50.44	3.4	R	"	"	"	"
grc10-1583	41.77133	-113.85448	17	32.45	.159	5.87	1.45	.022	.045	**.437**	.045	6.03	1.11	.033	.182	49.14	2.8	I(17), II(3)	"	"	"	"
yos10-1581	41.982267	-113.533923	20	34.05	.136	5.91	1.50	.023	.010	.492	.049	3.80	1.20	.034	.080	51.21	9.2	uni	XIII?	Cougar Point XIII?	11.03	0.03
thermal96-1(6.0')	41.93617	-114.05074	20	33.91	.122	6.11	1.50	.027	.022	.459	.028	5.07	1.92	.043	.364	50.75	4.4	uni	XIII	Cougar Point XIII	11.03	0.03
dch09-1491	41.62598	-113.486989	20	34.22	.127	5.96	1.44	.028	.020	.463	.048	4.60	1.65	.041	.205	51.60	3.4	uni	"	"	"	"
F11-145GC	41.660345	-114.007784	18	33.68	.118	6.05	1.47	.027	**.031**	.452	.048	4.18	1.67	.043	.032	51.86	3.2	I(18), II(2)	"	"	"	"
grc10-1590	41.730253	-113.875635	20	33.22	.133	5.84	1.52	.027	.029	.449	.011	5.13	1.62	**.035**	- - -	49.61	4.0	R	XIII?	Cougar Point XIII?	11.03	0.03
grc10-1588	41.730727	-113.871809	19	33.20	.135	5.85	1.54	.025	.029	.450	.008	5.20	1.59	.036	- - -	49.73	1.3	R	"	"	"	"
M10GC-532	41.746514	-114.030492	6	32.84	.131	6.05	1.48	.033	.035	.405	.043	4.86	1.93	.048	.099	48.93	5.7	I(6), II(1), IIa(1), IIIb(1)	HTC1	Huntington Cr. 1	15.53	0.03
grc10-1591	41.729034	-113.884747	10	33.33	.142	5.85	1.56	.022	.031	.461	.005	4.86	1.76	.042	- - -	49.39	6.5	I(10), II(9)	grc10-1591	grc10-1591	x	x
M10GC-357	41.541326	-113.450991	6	33.08	.139	5.97	1.56	.021	.025	.485	.071	4.71	1.88	.043	.159	48.91	1.9	R1(6), IIa(1), IIb(1), IIc(1), IId(1)	swt96-945	swt96-945	~11	x
grc09-1464	41.755884	-113.835225	18	33.71	.144	5.96	1.59	.026	.030	.478	.059	5.00	1.73	.037	.177	51.80	2.6	I(18), II(2)	"	"	"	"
gc96-949	41.96068	-114.01155	20	34.46	.136	6.26	1.48	.033	.058	.436	.052	5.30	1.45	.038	.231	50.97	9.4	uni	gc96-949	gc96-949	~9	x
gc96-968	41.98152	-113.99614	17	34.45	.151	6.26	1.51	.032	.058	.456	.071	5.38	1.42	.035	.382	51.06	2.6	I(17), II(2)	"	"	"	"
grc09-1497	41.437812	-113.737003	15	33.40	.147	5.99	1.53	.028	.051	.449	.081	5.65	1.62	.034	.193	49.95	2.3	I(15), II(2), III(1)	"	"	"	"
jnc10-1593	41.939624	-113.710725	9	33.18	.159	5.99	1.48	.028	.068	.483	.075	5.78	1.39	.034	.198	49.75	5.5	I(9), II(6), III(2)	OC6	Opal Canyon 6	9.60	0.22
M10GC-355	41.540473	-113.448717	11	32.96	.158	5.99	1.52	.028	.045	.552	.065	4.68	1.87	.034		48.82	7.2	R	M10GC-355	M10GC-355	x	x
dch09-1490	41.659204	-113.49814	10	34.28	.152	5.93	1.51	.027	.036	.462	.056	3.78	1.15	.026	.103	52.75	6.2	I(10), II(7)	dch09-1490	dch09-1490	x	x
M10GC-358	41.545231	-113.463342	16	33.08	.158	5.92	1.51	.023	.052	**.470**	.077	4.88	1.76	.022	.144	49.02	4.0	I(16), II(3), III(1)	M10GC-358	M10GC-358	x	x
jnc09-1479	41.941289	-113.711675	20	34.09	.150	5.92	1.54	.031	.044	.459	.072	4.84	1.68	.033	.173	51.64	4.2	uni	IX?	Cougar Point IX?	11.71	0.04
GCDC-44	41.98685	-113.95646	12	33.12	.135	6.00	1.57	.028	.045	.462	.083	6.09	1.24	.039	.194	50.47	2.5	I(12), II(7)	GCDC-44	GCDC-44	x	x
M10GC-097	41.972594	-113.15903	8	32.51	.157	5.92	1.62	.034	.057	.527	.064	4.64	1.80	.035	.033	49.42	6.3	I(8), II(4), III(3), IV(2)	M10GC-097	M10GC-097	x	x
usu88-4	0	0	10	33.42	.254	6.19	1.51	.038	.124	.584	.108	4.37	2.02	.042	.167	50.28	19.6	I(10), II(3), III(3), IVa(1), IVb(1)	usu88-4	usu88-4	x	x
gc96-955	41.92583	-114.0374	15	34.37	.212	6.38	1.54	.028	.116	.583	.061	4.38	1.91	.040	.220	51.16	5.5	I(15), II(5)	gc96-955	gc96-955	x	x

GCDC-47	41.98677	-113.95592	10	33.57	.197	5.92	1.46	.025	.093	.486	.091	5.10	1.59	.022	.145	50.65	9.9	I(10), II(9)	**GCDC-47**	**GCDC-47**	**x**	**x**
RPS 73-55	41.439276	-113.731115	20	33.60	.207	6.24	1.44	.030	.090	.572	.022	4.84	1.47	.020	.123	50.72	5.6	uni	**IP8**	**Ibex Peak 8**	**11.9**	**0.02**
dch91-03	41.650732	-113.516804	9	32.14	.212	5.89	1.49	.029	.091	**.544**	- - -	4.53	0.96	.015	.100	- - -	3.5	uni	"	"	"	"
M10GC-173	41.649769	-113.344458	18	33.02	.212	5.99	1.50	.028	.086	.553	.058	4.21	2.08	.033	.132	49.22	4.4	I(18), II(1)	**M10GC-173**	**M10GC-173**	**x**	**x**
M10GC-352	41.536159	-113.439816	12	32.99	.210	6.02	1.51	.029	.087	.567	.066	4.26	2.04	.035	.122	49.19	1.1	I(12), II(3), III(2), IV(1)	**M10GC-352**	**M10GC-352**	**x**	**x**
M10GC-354	41.540437	-113.448332	11	32.97	.187	6.03	1.49	.033	.069	.515	.083	4.41	2.06	.022	.150	49.28	6.5	R1(11), R2(5), III(2)	**btd95-829**	**btd95-829**	**10.4**	**0.06**
dch09-1486	41.663333	-113.492558	16	34.06	.202	6.11	1.54	.024	.069	.552	.067	2.88	1.40	.022	.048	52.94	4.2	I(16), II(2), IIIa(1), IIIb(1)	**XII**	**Cougar Pt. XII**	**11.2**	**0.02**
gc09-1462dup	41.90248	-114.00948	18	32.93	.223	6.09	1.57	.028	.091	.586	.065	6.10	0.81	.026	.140	51.16	6.3	I(18), IIa(1), IIb(1)	**gc09-1462dup**	**gc09-1462dup**	**x**	**x**
gc09-1462	41.90248	-114.00948	16	33.02	.211	6.05	1.59	.021	.093	.598	.051	6.11	0.83	.027	.148	52.23	2.3	I(16), IIa(1), IIb(1), IIc(1)	**gc09-1462**	**gc09-1462**	**x**	**x**
gc96-967	41.92579	-114.03744	10	34.04	.207	6.48	1.55	.031	.109	.577	.049	4.51	1.65	.025	.267	52.01	5.0	I(10), II(4), III(3), IV(2)	**gc96-967**	**gc96-967**	**x**	**x**
gc96-964	41.92556	-114.03766	16	33.92	.222	6.43	1.61	.030	.102	.587	.059	4.57	1.56	.028	.243	51.69	3.9	I(16), II(4)	**tc90-18**	**tc90-18**	**10.30**	**0.02**
gc96-966	41.92573	-114.0375	20	34.08	.224	6.55	1.63	.028	.110	.605	.044	4.51	1.67	.025	.281	52.68	2.7	uni	"	"	"	"
gc96-965	41.92569	-114.03754	15	33.98	.223	6.48	1.62	.034	.114	.611	.043	4.39	1.74	.025	.224	52.11	1.8	I(15), II(3), III(1)	"	"	"	"
dch09-1447	41.618019	-113.523661	17	33.70	.192	6.03	1.61	.026	.068	.565	.049	4.47	1.07	.030	.115	52.73	11.4	R1(17), R2(3)	**HAZ**	**Hazen**	**9.8**	**0.3**
dch09-1443	41.656366	-113.51387	17	33.63	.192	6.03	1.62	.023	.067	.566	.058	4.69	1.18	.028	.083	52.58	1.1	I(17), II(3)	"	"	"	"
gc96-957	41.92504	-114.03815	16	34.11	.188	6.36	1.63	.027	**.081**	.565	.059	4.93	1.43	.028	.252	52.06	3.5	I(16), II(4)	**HAZ?**	**Hazen?**	**9.8**	**0.3**
gc96-956	41.92495	-114.03824	20	34.28	.200	6.44	1.63	.027	**.086**	.565	.047	4.62	1.65	.024	.254	51.82	2.0	uni	**tc90-18**	**tc90-18**	**10.3**	**0.02**
gc96-952	41.93261	-114.04014	21	34.48	.195	6.44	1.69	.027	.083	**.586**	.056	5.08	1.85	.026	.339	49.71	3.7	uni	"	"	"	"
hsy94-717	41.96132	-114.01251	17	34.61	.181	6.11	1.71	.033	.072	.560	.056	5.06	1.75	.046	.191	49.41	6.0	I(17), II(3)	**btd95-835**	**btd95-835**	**8.67**	**0.08**
hsy94-716	41.96267	-114.01195	21	34.08	.196	6.08	1.76	.036	.074	**.614**	.054	5.18	1.66	.048	.099	49.89	4.6	uni	"	"	"	"
gc96-963dup	41.92553	-114.03769	11	33.99	.219	6.56	1.82	.029	.119	.678	.049	4.30	1.69	.025	.251	51.94	12.8	I(11), II(3), III(4)	**gc96-963dup**	**gc96-963dup**	**x**	**x**
gc96-963	41.92553	-114.03769	11	33.93	.239	6.50	1.81	.031	.114	.686	.047	3.85	1.28	.028	.254	52.55	2.7	I(11), II(4), III(3)	**gc96-963**	**gc96-963**	**x**	**x**
grc10-1592	41.770784	-113.902264	20	32.90	.231	6.19	1.75	.030	.107	.632	.129	5.78	1.18	.031	.178	50.27	5.0	uni	**grc10-1592**	**grc10-1592**	**x**	**x**
gc96-960	41.92528	-114.03793	14	33.85	.237	6.50	1.76	.024	.105	.646	.052	4.62	1.55	.026	.227	51.25	2.2	I(14), II(6)	**gc96-960**	**gc96-960**	**x**	**x**
gc96-954	41.92591	-114.03733	13	34.44	.200	6.37	1.75	.028	.092	.598	.055	4.73	2.03	.041	.183	49.99	6.9	I(13), II(6), III(1)	**gc96-954**	**gc96-954**	**x**	**x**
gc96-962	41.92544	-114.03777	11	33.86	.200	6.46	1.75	.027	.093	.623	.070	4.51	1.68	.030	.256	51.61	3.1	I(11), II(6), III(3)	**WSB**	**Wooden Shoe Butte**	**10.21**	**0.03**
gc96-961	41.92538	-114.03783	11	34.07	.193	6.49	1.78	.025	.092	.627	.061	4.35	1.69	.035	.257	51.84	2.1	I(11), II(8)	"	"	"	"
gc96-973	42.077772	-113.92745	13	34.67	.195	6.36	1.77	.031	.084	.606	.050	5.24	1.64	.032	.161	50.24	2.7	I(13), II(6), III(1)	"	"	"	"
dch09-1440	41.658874	-113.516573	7	33.11	.212	6.14	1.90	.045	.090	.702	.062	4.06	0.82	.033	.000	53.02	9.9	I(7), II(2), III(1)	**dch09-1440**	**dch09-1440**	**x**	**x**
dch09-1439	41.659304	-113.517107	7	33.33	.206	6.11	1.84	.031	.088	.659	.062	4.01	0.97	.041	.045	52.71	5.8	I(7), II(6), III(4), IV(2), V(1)	**dch09-1439**	**dch09-1439**	**x**	**x**
grc10-1596	41.714168	-113.849641	11	33.01	.153	5.90	1.68	.026	.040	.517	.010	4.95	1.66	.035	.000	49.57	17.3	I(11), R2(8), (1)	**grc10-1596**	**grc10-1596**	**x**	**x**
dch09-1488	41.660716	-113.494475	12	33.83	.173	5.97	1.75	.031	.038	.526	.066	3.55	1.12	.024	.086	52.80	5.1	uni	**dch09-1488**	**dch09-1488**	**x**	**x**
RPS 73-30	41.928959	-114.040231	20	33.43	.170	6.06	1.71	.024	.053	.584	.057	5.13	1.32	.024	.122	50.99	5.8	I(20), II(1)	**RPS 73-30**	**RPS 73-30**	**x**	**x**
RPS 73-39	42.053023	-113.933408	14	33.53	.171	6.08	1.72	.026	.050	.591	.061	5.36	0.90	.022	.124	51.27	1.5	uni	"	"	**x**	**x**
gc94-720	42.052483	-113.933725	26	33.57	.188	5.91	1.74	.026	.050	.580	.089	5.49	1.15	.018	.202	50.17	2.3	uni	"	"	**x**	**x**
grc10-1585	41.77388	-113.85459	20	33.12	.178	5.92	1.77	.020	.062	.582	.109	5.73	1.12	.023	.212	49.91	3.7	uni	**grc10-1585**	**grc10-1585**	**x**	**x**
dch09-1478	41.689045	-113.473005	19	33.98	.181	5.96	1.81	.022	.050	.592	.079	3.48	1.13	.017	.053	52.81	3.8	I(19), II(1)	**dch09-1478**	**dch09-1478**	**x**	**x**
grc10-1608	41.748253	-113.799487	19	32.63	.166	5.94	1.84	.037	.046	.578	.006	4.65	1.83	.031	.000	49.76	5.4	I(19), II(2)	**sv92- 62**	**sv92- 62**	**13.7**	**0.02**
F11-183GC	41.623659	-113.970005	16	32.98	.169	6.08	1.84	.033	.062	.585	.087	5.62	1.53	.035	.287	50.61	3.8	I(16), II(3)	"	"	"	"
grc96-983	41.79606	-113.82915	18	33.68	.149	6.21	1.89	.047	.050	.512	.056	4.60	0.56	.034	.173	51.72	7.0	I(18), IIa(1), IIb(1)	**buf94-615**	**buf94-615**	**15.2**	**0.02**
dch09-1441	41.65826	-113.51357	13	33.11	.224	6.13	1.90	.036	.098	.701	.051	4.87	1.33	.029	.165	52.03	17.8	I(13), R2(4), III(3)	**mn93-02**	**mn93-02**	**~11?**	**x**
dch09-1438(Ia)	41.659384	-113.517542	4	32.88	.210	6.16	1.94	.027	.111	.734	.040	4.28	0.78	.029	.079	52.74	5.0	**Ia(4)**, Ib(4), II(1)	**dch09-1438**	**dch09-1438**	**x**	**x**
dch09-1438(Ib)	41.659384	-113.517542	4	32.35	.271	6.25	2.33	.034	.137	.917	.035	4.49	0.65	.032	.100	52.97	25.4	Ia(4), **Ib(4)**, II(1)	**dch09-1438**	**dch09-1438**	**x**	**x**
gc96-958	41.92509	-114.0381	15	33.74	.234	6.49	1.97	.031	.117	.736	.056	4.30	1.68	.022	.269	52.52	23.4	I(15), II(3), III(2)	**gc96-958**	**gc96-958**	**x**	**x**
gc96-969	41.98157	-113.99599	8	34.11	.194	6.35	1.92	.043	.085	.676	.060	5.08	1.59	.035	.232	50.33	10.2	I(8), II(6), III(3), IV(2)	**gc96-969**	**gc96-969**	**x**	**x**
gc96-950	41.96068	-114.01155	7	34.13	.193	6.39	1.99	.038	.092	.680	.066	4.92	1.85	.032	.180	49.81	3.9	I(7), II(5), III(4), IV(3), V(1)	**gc96-950**	**gc96-950**	**x**	**x**
grc09-1474	41.78219	-113.83908	17	32.39	.198	6.36	2.13	.042	.093	.664	.101	4.23	0.54	.026	.086	51.96	8.0	I(17), IIa(1), IIb(1), IIc(1)	**grc09-1474**	**grc09-1474**	**x**	**x**
gc96-959	41.92524	-114.03796	10	33.56	.250	6.63	2.18	.040	.145	.844	.046	4.21	1.78	.028	.263	51.56	17.1	I(10), II(9), III(1)	**gc96-959**	**gc96-959**	**x**	**x**
grc96-982	41.796104	-113.829245	20	34.34	.135	5.94	1.74	.045	.015	.439	.025	4.50	0.52	.037	.136	51.71	46.8	uni	**nm08-1419**	**nm08-1419**	**15.3**	**x**
grc96-981	41.79614	-113.82929	18	33.87	.141	5.98	1.97	.053	.011	.499	.044	4.55	0.65	.033	.180	51.14	12.9	I(18), IIa(1), IIb(1)	**VV8**	**Virgin Valley 8**	**15.4**	**x**
grc96-976	41.79624	-113.82964	9	33.61	.161	5.88	2.02	.043	.012	.508	.070	4.18	0.87	.034	.168	50.83	4.2	I(9), II(8)	**VV4**	**Virgin Valley 4**	**15.6**	**x**
grc96-980	41.79616	-113.82932	14	33.47	.150	6.03	2.14	.049	.012	.552	.067	4.21	0.53	.032	.146	51.53	7.1	I(14), II(5), III(1)	**grc94-980**	**grc94-980**	**15.4**	**x**
MW10GC-21	41.895548	-113.822321	12	32.56	.186	5.96	2.16	.039	.034	.594	.003	4.17	2.04	.035	.000	50.18	7.2	I(12), II(1)	**MW10GC-21**	**MW10GC-21**	**x**	**x**
grc09-1495	41.439064	-113.736601	9	31.75	.259	7.18	1.99	.125	.209	.602	.025	3.97	3.20	.179	.145	50.79	57.1	I(9), II(2), III(1)	**grc09-1495**	**grc09-1495**	**x**	**x**
grc96-979	41.79617	-113.82934	19	33.21	.160	6.07	2.39	.062	.018	.618	.078	4.15	0.61	.031	.175	51.10	62.3	uni	**grc96-979**	**grc96-979**	**15.45**	**x**
grc09-1473	41.80399	-113.82484	7	32.59	.186	6.10	2.50	.066	.018	.674	.104	3.77	0.78	.030	.072	52.09	7.9	I(7), IIa(4), IIb(4), III(2)	**SC3**	**Sheep Cr. 3**	**15.93**	**0.01**
grc96-977	41.79622	-113.82951	18	32.99	.189	6.07	2.61	.069	.022	.701	.109	3.97	0.72	.030	.178	51.19	6.3	I(18), II(2)	**grc96-977**	**grc96-977**	**15.53**	**x**
grc96-978	41.79619	-113.82937	15	32.90	.197	6.11	2.70	.067	.021	.736	.104	3.91	0.63	.030	.185	50.63	5.4	I(15), II(5)	**buf94-606**	**buf94-606**	**15.5**	**x**
grc96-984	41.79643	-113.83028	10	32.52	.227	6.13	3.17	.082	.066	.946	.080	3.38	0.61	.032	.203	51.60	30.3	I(10), II(8), III(1)	**grc94-984**	**grc94-984**	**15.65**	**x**

P.M. = Primary Mode

Note - Tephra names in red font have $^{40}Ar/^{39}Ar$ ages.

D = Statistical Distance based on elements Ti, Fe, Ca, Mn, Mg, Ca, and Cl

$$\mathbf{D = \Sigma[E_{i+1} - E_i]^2/2\sigma^2}$$

Element data in weight percent

Table 3. *Electron microprobe analyses of glass shards.*

n = number of shards analyzed
element data in weight percent

Sample	n	Si	Ti	Al	Fe	Mn	Mg	Ca	Ba	K	Na	Cl	F	O
093F09GC	15	34.43	.109	6.03	1.34	.030	.033	.380	.022	4.20	1.99	.053	.174	51.96
099F09GC	20	34.46	.120	6.04	0.94	.027	.049	.331	.005	5.15	1.67	.071	.159	51.69
brh09-1481	18	34.15	.168	5.99	1.11	.013	.055	.398	.020	5.32	1.50	.027	.172	51.75
brh09-1510	19	33.39	.116	5.87	1.26	.025	.028	.395	.008	5.51	1.48	.047	.000	50.16
brh09-1550	17	34.25	.083	6.21	0.93	.019	.019	.408	.024	5.30	1.85	.063	.208	49.44
brh09-1551	19	33.98	.118	6.14	1.34	.026	.032	.418	.009	5.69	1.46	.056	.222	50.72
brh09-1552	20	34.01	.084	6.00	0.98	.021	.026	.368	.002	5.81	1.37	.075	.230	50.10
brh09-1554	20	34.23	.146	6.00	1.18	.019	.053	.416	.016	5.83	1.19	.038	.193	51.14
brh94-719	21	34.25	.124	5.99	1.32	.019	.031	.418	.032	5.62	0.72	.038	.180	51.09
dch09-1438	9	32.88	.230	6.16	2.03	.029	.108	.740	.047	4.32	0.75	.030	.074	52.81
dch09-1439	20	33.33	.206	6.11	1.84	.031	.088	.659	.062	4.01	0.97	.041	.045	52.71
dch09-1440	8	33.40	.198	6.10	1.77	.037	.080	.636	.068	4.06	0.88	.032	.007	53.11
dch09-1441	20	33.11	.224	6.13	1.90	.036	.098	.701	.051	4.87	1.33	.029	.165	52.03
dch09-1442	15	34.01	.158	5.98	1.48	.019	.046	.480	.046	4.09	1.17	.025	.097	52.84
dch09-1443	20	33.74	.185	6.02	1.56	.022	.063	.541	.054	4.70	1.25	.028	.079	52.52
dch09-1444	19	33.81	.166	5.98	1.56	.028	.044	.502	.050	4.99	1.51	.030	.149	51.93
dch09-1446	4	34.17	.083	6.39	0.82	.034	.050	.452	.048	4.62	2.10	.105	.071	51.29
dch09-1447	20	33.74	.185	6.02	1.56	.024	.064	.543	.045	4.55	1.09	.031	.118	52.66
dch09-1478	20	34.00	.179	5.96	1.80	.022	.050	.587	.080	3.49	1.12	.017	.053	52.81
dch09-1486	20	34.11	.197	6.08	1.48	.024	.064	.527	.064	2.93	1.41	.023	.054	52.93
dch09-1488	12	33.83	.173	5.97	1.75	.031	.038	.526	.066	3.55	1.12	.024	.086	52.80
dch09-1490	17	34.16	.168	5.95	1.62	.026	.042	.487	.059	3.73	1.15	.024	.119	52.75
dch09-1491	20	34.22	.127	5.96	1.44	.028	.020	.463	.048	4.60	1.65	.041	.205	51.60
dch91-01	8	33.02	.141	5.91	1.34	.023	.044	.413	.000	4.66	0.83	.027	.069	0.00
dch91-02	10	32.01	.144	5.82	1.28	.024	.044	.391	.000	4.68	0.98	.031	.125	0.00
dch91-03	9	32.14	.212	5.89	1.49	.029	.091	.544	.000	4.53	0.96	.015	.100	0.00
dch91-04	9	32.39	.138	6.11	1.31	.028	.047	.416	.000	4.59	0.97	.029	.122	0.00
dch91-05	8	32.39	.140	5.80	1.28	.017	.042	.394	.000	4.81	0.92	.032	.125	0.00
F10-043GC	20	34.41	.121	5.91	1.35	.039	.030	.384	.021	4.21	2.00	.049	.830	50.73
F10-047GC	18	34.26	.120	5.83	1.33	.027	.026	.385	.022	4.69	1.93	.054	.812	49.60
F10-071GC	20	33.76	.172	6.04	1.00	.042	.083	.379	.006	4.20	2.20	.107	.000	50.20
F10-086GC	18	33.93	.214	5.86	1.50	.031	.075	.553	.039	4.58	1.74	.035	.809	49.74
F10-094GC	18	32.51	.271	7.26	2.33	.059	.216	1.025	.017	2.93	3.38	.128	.757	48.75
F10-255GC	19	33.40	.153	5.85	1.13	.016	.054	.391	.008	4.99	1.72	.030	.000	50.22
F10-282GC	20	33.43	.111	5.88	1.28	.025	.027	.366	.006	4.45	1.75	.052	.000	50.54
F11-145GC	20	33.70	.116	6.04	1.46	.027	.030	.447	.053	4.18	1.67	.044	.043	51.86
F11-183GC	19	32.98	.169	6.08	1.84	.033	.062	.585	.087	5.62	1.53	.035	.287	50.61
gc09-1460	20	33.70	.095	5.98	1.00	.022	.034	.374	.006	6.14	0.54	.071	.058	52.79
gc09-1461	20	33.63	.142	5.87	1.30	.018	.038	.408	.023	6.13	0.81	.033	.138	52.28
gc09-1462	19	33.08	.203	6.04	1.56	.020	.086	.577	.053	6.16	0.83	.028	.150	52.20
gc09-1462dup	20	32.95	.218	6.08	1.56	.029	.089	.574	.067	6.12	0.83	.026	.137	51.13
gc09-1463	20	33.58	.152	5.91	1.49	.019	.045	.492	.040	5.91	0.77	.028	.143	52.23
gc94-720	26	33.57	.188	5.91	1.74	.026	.050	.580	.089	5.49	1.15	.018	.202	50.17
gc96-949	20	34.44	.140	6.26	1.50	.033	.060	.445	.050	5.26	1.46	.035	.230	51.08
gc96-950	20	34.13	.193	6.39	1.99	.038	.092	.680	.066	4.92	1.85	.032	.180	49.81
gc96-952	21	34.48	.195	6.44	1.69	.027	.083	.586	.056	5.08	1.85	.026	.339	49.71
gc96-954	20	34.57	.184	6.38	1.65	.027	.086	.559	.057	4.76	2.04	.043	.175	50.05
gc96-955	20	34.45	.207	6.34	1.48	.023	.110	.558	.062	4.46	1.86	.040	.217	51.06
gc96-956	20	34.28	.200	6.44	1.63	.027	.086	.565	.047	4.62	1.65	.024	.254	51.82
gc96-957	20	34.21	.178	6.34	1.56	.027	.076	.536	.057	4.99	1.43	.029	.251	52.14
gc96-958	20	33.74	.234	6.49	1.97	.031	.117	.736	.056	4.30	1.68	.022	.269	52.52
gc96-959	20	33.56	.250	6.63	2.18	.040	.145	.844	.046	4.21	1.78	.028	.263	51.56
gc96-960	20	33.94	.227	6.46	1.69	.024	.101	.614	.058	4.67	1.54	.024	.231	51.29
gc96-961	19	34.25	.173	6.43	1.59	.020	.078	.540	.048	4.60	1.62	.032	.251	51.61
gc96-962	20	34.15	.179	6.41	1.59	.027	.079	.552	.058	4.69	1.58	.032	.253	51.55
gc96-963	19	34.14	.202	6.52	1.70	.027	.106	.615	.049	4.46	1.64	.028	.244	51.96
gc96-963dup	18	34.12	.219	6.48	1.68	.028	.096	.610	.051	4.20	1.41	.029	.243	52.25

gc96-964	20	34.03	.218	6.42	1.57	.027	.098	.567	.058	4.60	1.56	.026	.246	51.68
gc96-965	19	34.02	.220	6.45	1.59	.031	.109	.589	.051	4.44	1.72	.023	.228	52.07
gc96-966	20	34.08	.224	6.55	1.63	.028	.110	.605	.044	4.51	1.67	.025	.281	52.68
gc96-967	19	34.34	.180	6.43	1.36	.027	.091	.494	.057	4.68	1.60	.030	.272	51.91
gc96-968	19	34.45	.151	6.26	1.51	.032	.058	.456	.071	5.38	1.42	.035	.382	51.06
gc96-969	19	34.11	.194	6.35	1.92	.043	.085	.676	.060	5.08	1.59	.035	.232	50.33
gc96-970	19	34.71	.142	6.32	1.24	.016	.064	.392	.022	5.44	1.64	.035	.283	50.58
gc96-971	20	34.44	.136	6.29	1.26	.023	.068	.400	.049	5.33	1.52	.045	.230	50.84
gc96-972	6	34.77	.160	6.23	1.36	.026	.067	.442	.059	5.36	1.78	.038	.101	49.85
gc96-972dup	20	35.08	.171	6.33	1.38	.026	.066	.446	.074	5.08	1.83	.042	.134	50.14
gc96-973	20	34.78	.186	6.35	1.68	.031	.078	.573	.053	5.21	1.68	.036	.159	50.33
GCDC-44	19	33.21	.133	5.99	1.51	.030	.042	.444	.063	6.16	1.23	.040	.261	50.45
GCDC-46	20	33.48	.106	6.05	1.34	.022	.032	.384	.027	5.73	1.61	.073	.250	50.21
GCDC-46dup	20	33.48	.104	6.01	1.34	.020	.030	.389	.010	5.49	1.33	.080	.255	50.72
GCDC-47	19	33.39	.234	6.01	1.59	.026	.108	.558	.068	4.88	1.80	.026	.209	50.67
gcj91-05	6	33.43	.137	6.19	1.39	.020	.058	.463	.000	5.45	0.56	.056	.148	0.00
gcj91-07	8	34.40	.134	6.19	1.38	.023	.036	.418	.000	5.99	0.75	.047	.117	0.00
grc09-1456	19	34.47	.032	6.40	0.77	.022	.008	.416	.013	4.42	2.43	.128	.003	51.52
grc09-1458	20	33.89	.152	5.89	1.07	.020	.054	.395	.021	5.53	1.42	.037	.152	51.73
grc09-1464	20	33.71	.144	5.95	1.57	.027	.030	.474	.055	5.04	1.70	.037	.173	51.79
grc09-1465	18	34.04	.152	5.95	1.35	.024	.048	.443	.070	4.57	1.86	.045	.130	52.03
grc09-1466	8	33.51	.147	6.23	1.31	.023	.078	.611	.064	4.41	1.93	.058	.103	50.63
grc09-1467	19	33.89	.089	6.04	1.12	.020	.024	.355	.008	4.91	1.88	.074	.173	50.64
grc09-1468	19	33.98	.112	6.00	1.22	.026	.035	.392	.033	5.10	1.74	.053	.141	50.68
grc09-1469	19	33.75	.121	6.01	1.35	.028	.028	.410	.022	4.78	1.86	.041	.154	50.61
grc09-1473	17	32.59	.186	6.10	2.50	.066	.018	.674	.104	3.77	0.78	.030	.072	52.09
grc09-1474	20	32.39	.198	6.36	2.13	.042	.093	.664	.101	4.23	0.54	.026	.086	51.96
grc09-1475	20	33.67	.106	6.03	1.26	.021	.031	.400	.034	4.89	1.76	.049	.188	50.87
grc09-1476	20	33.83	.129	6.08	1.33	.023	.033	.427	.051	4.78	1.86	.054	.178	50.84
grc09-1477	20	33.82	.119	6.03	1.15	.018	.038	.369	.008	5.86	1.38	.064	.194	50.59
grc09-1480	21	33.75	.188	6.06	1.40	.024	.056	.435	.017	5.90	0.75	.031	.191	52.02
grc09-1494	19	34.19	.042	6.16	0.68	.045	.030	.255	.000	4.73	2.39	.100	.179	50.45
grc09-1495	13	31.61	.272	7.25	2.09	.122	.232	.666	.030	3.96	3.04	.173	.166	50.78
grc09-1497	18	33.44	.146	5.97	1.51	.030	.050	.443	.081	5.65	1.61	.034	.166	50.00
grc09-1499	20	34.09	.112	6.04	1.35	.026	.022	.393	.004	6.05	1.11	.071	.220	50.79
grc09-1500	20	33.70	.170	6.25	1.38	.022	.068	.469	.040	6.36	0.90	.044	.180	50.81
grc09-1504	20	34.20	.110	6.03	1.33	.021	.024	.383	.003	6.15	0.94	.067	.197	50.66
grc09-1505	21	34.63	.124	5.97	1.22	.022	.033	.359	.011	5.69	1.44	.045	.197	50.54
grc09-1511	18	34.52	.131	6.09	1.37	.026	.035	.431	.038	4.82	1.90	.050	.177	50.43
grc09-1513	20	33.99	.164	6.08	1.54	.025	.050	.493	.051	4.65	1.83	.028	.172	50.43
grc09-1514	20	34.17	.160	6.08	1.31	.026	.043	.409	.014	4.83	1.73	.033	.182	50.71
grc09-1517	13	34.15	.151	6.04	1.33	.026	.045	.418	.035	5.22	1.61	.032	.164	50.75
grc09-1518	18	34.49	.110	6.10	0.94	.025	.048	.327	.007	5.30	1.69	.074	.164	50.56
grc10-1583	20	32.47	.153	5.86	1.43	.023	.042	.431	.047	6.03	1.10	.032	.177	49.17
grc10-1584	12	34.13	.037	6.38	0.75	.014	.013	.390	-.002	4.56	2.49	.149	.408	50.64
grc10-1585	20	33.12	.178	5.92	1.77	.020	.062	.582	.109	5.73	1.12	.023	.212	49.91
grc10-1588	19	33.20	.135	5.85	1.54	.025	.029	.450	.008	5.20	1.59	.036	.000	49.73
grc10-1590	20	33.22	.133	5.84	1.52	.027	.029	.449	.011	5.13	1.62	.035	.000	49.61
grc10-1591	19	33.42	.133	5.85	1.50	.021	.029	.438	.005	5.01	1.68	.043	.000	49.38
grc10-1592	20	32.90	.231	6.19	1.75	.030	.107	.632	.129	5.78	1.18	.031	.178	50.27
grc10-1596	20	33.01	.153	5.90	1.68	.026	.040	.517	.010	4.95	1.66	.035	.000	49.57
grc10-1600	18	33.48	.091	5.94	1.01	.014	.031	.351	.002	5.76	1.34	.066	.000	49.85
grc10-1601	19	33.48	.094	5.93	1.01	.018	.032	.346	.008	5.72	1.38	.066	.000	49.58
grc10-1602	19	32.92	.173	5.93	1.25	.022	.070	.459	.005	6.10	0.99	.037	.000	49.70
grc10-1606	20	32.82	.096	5.82	0.98	.019	.038	.361	.007	6.01	1.07	.070	.000	49.80
grc10-1608	21	32.63	.166	5.94	1.84	.037	.046	.578	.006	4.65	1.83	.031	.000	49.76
grc10-1609	18	33.34	.131	5.83	1.32	.027	.027	.397	.005	5.93	1.04	.037	.000	50.19
grc96-975	19	34.06	.054	6.23	0.68	.027	.031	.319	.019	5.10	1.31	.081	.080	51.26
grc96-976	20	33.61	.161	5.88	2.02	.043	.012	.508	.070	4.18	0.87	.034	.168	50.83
grc96-977	20	32.99	.189	6.07	2.61	.069	.022	.701	.109	3.97	0.72	.030	.178	51.19
grc96-978	20	32.90	.197	6.11	2.70	.067	.021	.736	.104	3.91	0.63	.030	.185	50.63
grc96-979	19	33.21	.160	6.07	2.39	.062	.018	.618	.078	4.15	0.61	.031	.175	51.10
grc96-980	20	33.47	.150	6.03	2.14	.049	.012	.552	.067	4.21	0.53	.032	.146	51.53
grc96-981	20	33.87	.141	5.98	1.97	.053	.011	.499	.044	4.55	0.65	.033	.180	51.14

grc96-982	20	34.34	.135	5.94	1.74	.045	.015	.439	.025	4.50	0.52	.037	.136	51.71
grc96-983	20	33.68	.149	6.21	1.89	.047	.050	.512	.056	4.60	0.56	.034	.173	51.72
grc96-984	19	32.52	.227	6.13	3.17	.082	.066	.946	.080	3.38	0.61	.032	.203	51.60
hsy09-1520	16	33.87	.080	6.09	1.28	.022	.009	.419	.003	6.42	0.77	.088	.219	50.84
hsy09-1522	18	33.75	.078	6.09	1.17	.026	.013	.401	.003	6.19	0.84	.096	.260	51.01
hsy09-1527	16	33.80	.078	6.05	1.20	.022	.014	.404	.002	6.30	1.07	.088	.257	50.46
hsy09-1529	20	33.73	.129	6.14	1.24	.022	.053	.469	.040	5.93	1.22	.056	.199	50.74
hsy09-1535	20	33.93	.107	6.05	1.33	.021	.024	.396	.002	5.68	1.44	.070	.229	50.63
hsy09-1537	20	34.21	.103	6.10	1.06	.017	.036	.374	.006	5.44	1.56	.067	.191	50.71
hsy09-1539	20	34.41	.168	6.01	1.13	.022	.054	.397	.027	5.33	1.51	.031	.181	50.72
hsy09-1542	20	34.38	.087	6.10	1.03	.023	.035	.367	.004	5.60	1.46	.072	.222	50.62
hsy09-1544	17	34.32	.119	6.05	1.35	.025	.032	.432	.030	5.14	1.66	.054	.197	50.46
hsy09-1549	9	33.64	.151	6.15	1.44	.019	.042	.419	.022	6.25	1.26	.042	.156	50.44
hsy09-1570	20	33.93	.110	6.03	1.38	.030	.024	.400	.006	6.13	1.02	.073	.201	51.16
hsy09-1574	20	33.78	.166	6.10	1.38	.024	.064	.440	.026	6.12	1.10	.037	.179	51.40
hsy94-715	20	34.20	.155	6.03	1.44	.030	.058	.486	.109	5.00	1.57	.045	.196	51.37
hsy94-715dup	31	34.00	.158	6.00	1.46	.024	.060	.492	.092	5.18	1.48	.042	.197	50.57
hsy94-716	21	34.08	.196	6.08	1.76	.036	.074	.614	.054	5.18	1.66	.048	.099	49.89
hsy94-717	20	34.61	.181	6.11	1.71	.033	.072	.560	.056	5.06	1.75	.046	.191	49.41
jnc09-1449	17	34.48	.110	6.05	0.86	.040	.045	.293	.022	4.41	2.16	.102	.133	52.53
jnc09-1450	19	34.38	.116	6.03	0.86	.049	.046	.295	.024	4.64	2.09	.099	.147	52.03
jnc09-1479	20	34.09	.150	5.92	1.54	.031	.044	.459	.072	4.84	1.68	.033	.173	51.64
jnc10-1593	17	33.18	.159	5.99	1.48	.028	.068	.483	.075	5.78	1.39	.034	.198	49.75
JO11-12	20	33.89	.111	5.92	0.90	.018	.042	.305	.006	4.84	1.89	.072	.000	49.45
JO11-13	19	33.83	.108	5.92	1.29	.030	.028	.364	.009	4.68	2.03	.049	.000	49.58
js09-1451	17	33.80	.118	5.86	1.33	.029	.026	.419	.014	5.24	0.93	.040	.113	53.15
js09-1452	20	33.85	.100	5.98	1.19	.019	.023	.405	.017	5.01	1.06	.057	.126	53.00
js09-1453	18	34.06	.032	6.30	0.73	.018	.007	.391	.004	5.16	1.90	.112	.034	51.51
js09-1454	18	34.45	.046	6.42	0.94	.019	.012	.410	.004	4.20	2.60	.090	.135	51.61
M10GC-088	20	32.84	.190	5.87	1.42	.031	.075	.510	.075	4.50	1.83	.042	.135	49.49
M10GC-097	17	32.63	.140	5.89	1.48	.025	.044	.470	.059	4.82	1.68	.039	.030	49.51
M10GC-099	12	32.76	.094	5.85	1.25	.035	.027	.340	.029	4.43	1.58	.058	.119	50.27
M10GC-173	19	32.99	.212	5.99	1.52	.027	.088	.561	.057	4.20	2.09	.032	.135	49.21
M10GC-328	3	32.53	.134	6.28	0.93	.034	.103	.804	.130	5.09	1.07	.072	.081	49.67
M10GC-352	18	32.99	.203	6.01	1.51	.027	.082	.548	.062	4.26	2.03	.036	.123	49.22
M10GC-354	18	32.78	.201	6.10	1.65	.032	.086	.592	.076	4.35	2.11	.023	.151	49.16
M10GC-355	11	32.96	.158	5.99	1.52	.028	.045	.552	.065	4.68	1.87	.034	.000	48.82
M10GC-357	10	33.11	.123	6.01	1.44	.024	.023	.457	.057	4.76	1.89	.063	.164	48.92
M10GC-358	20	33.11	.159	5.92	1.48	.022	.049	.461	.079	4.89	1.76	.024	.150	49.01
M10GC-373	9	32.92	.140	5.90	1.44	.026	.037	.422	.049	5.46	1.48	.032	.002	48.61
M10GC-374	20	33.18	.114	5.90	1.30	.019	.027	.391	.018	5.46	1.50	.045	.128	48.94
M10GC-377	20	33.16	.135	5.92	1.25	.024	.042	.383	.030	5.14	1.64	.037	.165	49.36
M10GC-424	13	32.96	.102	5.94	0.93	.016	.040	.354	.003	6.01	0.84	.074	.054	49.29
M10GC-449	12	33.55	.097	5.94	1.30	.030	.020	.362	.004	5.41	1.67	.080	.000	50.17
M10GC-482	15	33.17	.129	5.92	1.26	.016	.029	.385	.007	6.30	0.96	.052	.000	50.25
M10GC-532	16	32.66	.142	6.13	1.60	.038	.043	.446	.049	4.88	1.98	.046	.129	48.82
RPS 73-20	21	33.61	.122	6.06	1.32	.025	.036	.432	.016	6.03	1.00	.040	.161	50.79
RPS 73-21	20	33.72	.118	6.06	1.26	.021	.030	.422	.010	5.91	0.94	.040	.145	50.95
RPS 73-26	7	33.94	.113	6.08	1.31	.029	.031	.424	.007	5.80	0.74	.046	.176	51.49
RPS 73-27	14	33.85	.121	6.01	1.38	.024	.019	.451	.032	5.66	1.10	.044	.172	50.57
RPS 73-28	20	33.74	.116	6.06	1.32	.019	.020	.440	.033	6.02	1.09	.041	.177	50.42
RPS 73-29	21	33.76	.126	6.05	1.40	.026	.022	.461	.014	5.82	1.15	.035	.117	50.58
RPS 73-30	21	33.43	.170	6.06	1.71	.024	.053	.584	.057	5.13	1.32	.024	.122	50.99
RPS 73-39	14	33.53	.171	6.08	1.72	.026	.050	.591	.061	5.36	0.90	.022	.124	51.27
RPS 73-41	20	33.87	.164	6.24	1.20	.032	.068	.474	.025	5.23	1.48	.042	.145	50.83
RPS 73-46	21	33.92	.137	6.11	1.13	.021	.055	.413	.014	5.16	1.47	.039	.180	51.30
RPS 73-49	17	34.14	.091	6.18	1.01	.024	.034	.372	.004	5.53	1.45	.071	.191	50.81
RPS 73-50	19	33.96	.091	6.14	1.02	.021	.036	.372	.000	5.57	1.38	.064	.211	50.26
RPS 73-51	22	33.99	.087	6.14	0.98	.016	.032	.373	.004	5.63	1.39	.072	.194	50.30
RPS 73-52	23	34.09	.084	6.17	0.99	.020	.037	.372	.000	5.55	1.42	.072	.193	50.44
RPS 73-54	4	34.01	.102	6.13	0.95	.025	.027	.370	.000	5.75	1.35	.070	.200	50.29
RPS 73-55	20	33.60	.207	6.24	1.44	.030	.090	.572	.022	4.84	1.47	.020	.123	50.72
rrm09-1485	17	34.37	.112	6.00	1.30	.035	.027	.375	.023	4.12	2.15	.051	.185	52.06
thermal96-1(6.0')	20	33.91	.122	6.11	1.50	.027	.022	.459	.028	5.07	1.92	.043	.364	50.75

thermal96-1(6.4')	18	34.07	.121	6.15	1.51	.030	.026	.464	.027	5.27	1.89	.042	.276	49.97
thermal96-1(6.9')	20	33.87	.137	6.15	1.57	.025	.022	.477	.030	5.68	1.66	.039	.242	49.82
thermal96-1(7.4')	20	33.85	.127	6.15	1.57	.024	.026	.485	.036	5.84	1.57	.041	.210	49.47
thermal96-1(7.8')	18	33.81	.120	6.13	1.52	.030	.022	.478	.027	6.23	1.31	.034	.167	48.93
thermal96-1(8.0')	20	33.65	.129	6.14	1.53	.020	.023	.506	.026	6.00	1.47	.031	.152	49.20
usu88-4	18	33.57	.243	6.15	1.45	.034	.113	.557	.107	4.41	1.99	.040	.170	50.28
usu88-6	19	34.22	.116	6.02	0.83	.029	.047	.314	.095	4.79	1.93	.104	.186	49.88
usu88-8	21	34.15	.116	6.03	0.84	.035	.049	.315	.094	4.60	2.03	.102	.197	50.03
usu88-9	20	33.76	.148	5.99	1.29	.019	.055	.436	.076	5.07	1.69	.033	.197	50.28
wch09-1483	14	33.94	.139	6.10	1.29	.025	.056	.478	.043	4.76	1.77	.052	.221	51.75
yos10-1580	18	33.95	.108	6.03	1.33	.037	.042	.365	.008	4.77	2.17	.056	.178	51.50
yos10-1581	20	34.05	.136	5.91	1.50	.023	.010	.492	.049	3.80	1.20	.034	.080	51.21
yos10-1582	20	33.56	.095	6.01	1.16	.021	.035	.362	-.018	6.21	1.03	.062	.286	50.98
yos10-1598	19	33.83	.100	6.06	0.98	.015	.050	.373	.019	5.43	1.74	.079	.272	50.17
yos10-1604	16	33.44	.186	5.95	1.20	.012	.079	.424	.005	4.54	1.98	.037	.000	50.01

Sample	Mode	n	Si	Ti	Al	Fe	Mn	Mg	Ca	Ba	K	Na	Cl	F	O
093F09GC	II	1	34.45	.092	6.08	1.17	.009	.030	.388	.000	4.19	1.78	.060	.169	51.87
093F09GC	R1	14	34.43	.110	6.03	1.35	.032	.033	.380	.024	4.20	2.01	.052	.174	51.97
099F09GC	R	20	34.46	.120	6.04	0.94	.027	.049	.331	.005	5.15	1.67	.071	.159	51.69
brh09-1481	II	1	34.48	.147	5.99	0.91	.005	.049	.373	.000	5.60	1.32	.037	.164	52.30
brh09-1481	I	17	34.13	.169	5.99	1.12	.014	.056	.399	.021	5.30	1.51	.026	.172	51.72
brh09-1510		19	33.39	.116	5.87	1.26	.025	.028	.395	.008	5.51	1.48	.047	.000	50.16
brh09-1550	IIa	1	34.31	.074	6.29	0.79	.023	.012	.367	.018	5.82	1.70	.065	.195	49.26
brh09-1550	I	14	34.27	.084	6.21	0.89	.018	.019	.405	.022	5.24	1.88	.063	.207	49.47
brh09-1550	IIb	2	34.13	.086	6.20	1.24	.024	.023	.443	.041	5.44	1.76	.059	.222	49.31
brh09-1551	II	3	34.33	.103	6.09	1.21	.018	.023	.383	.000	5.66	1.50	.062	.251	50.46
brh09-1551	R1	16	33.91	.121	6.15	1.37	.027	.034	.425	.010	5.69	1.46	.055	.216	50.77
brh09-1552		20	34.01	.084	6.00	0.98	.021	.026	.368	.002	5.81	1.37	.075	.230	50.10
brh09-1554		20	34.23	.146	6.00	1.18	.019	.053	.416	.016	5.83	1.19	.038	.193	51.14
brh94-719		21	34.25	.124	5.99	1.32	.019	.031	.418	.032	5.62	0.72	.038	.180	51.09
dch09-1438	III	1	33.78	.160	5.88	1.36	.025	.050	.433	.086	4.65	1.01	.030	.051	52.75
dch09-1438	Ia	4	33.18	.207	6.14	1.90	.024	.094	.641	.050	4.07	0.78	.028	.053	52.66
dch09-1438	Ib	4	32.35	.271	6.25	2.33	.034	.137	.917	.035	4.49	0.65	.032	.100	52.97
dch09-1439	V	1	34.07	.160	5.95	1.44	.021	.055	.466	.044	4.25	1.08	.033	.030	52.55
dch09-1439	III	4	33.69	.178	6.04	1.63	.032	.079	.557	.050	4.38	1.01	.044	.068	52.63
dch09-1439	IV	2	33.35	.210	6.13	1.77	.049	.080	.615	.117	4.17	0.98	.043	.049	52.46
dch09-1439	II	6	33.12	.215	6.13	1.92	.023	.097	.707	.069	3.90	0.95	.043	.010	52.73
dch09-1439	I	7	33.19	.220	6.14	1.96	.034	.094	.718	.049	3.82	0.94	.038	.064	52.83
dch09-1440	II	2	34.14	.164	5.99	1.48	.022	.060	.470	.060	4.14	1.00	.036	.000	53.09
dch09-1440	III	1	33.39	.194	6.18	1.73	.028	.074	.642	.108	3.91	0.93	.026	.057	53.60
dch09-1440	I	5	33.11	.212	6.14	1.90	.045	.090	.702	.062	4.06	0.82	.033	.000	53.02
dch09-1441	R2	4	33.72	.172	5.98	1.57	.026	.058	.528	.052	4.88	1.14	.031	.132	52.29
dch09-1441	I	13	33.12	.228	6.14	1.91	.036	.099	.700	.053	4.91	1.38	.028	.165	51.99
dch09-1441	III	3	32.26	.271	6.28	2.31	.051	.147	.935	.042	4.70	1.36	.030	.209	51.88
dch09-1442	I	8	34.14	.135	5.92	1.36	.017	.038	.420	.048	4.27	1.21	.024	.107	52.77
dch09-1442	III	2	34.05	.163	6.02	1.48	.008	.043	.495	.064	3.97	1.22	.034	.054	52.92
dch09-1442	IV	1	33.69	.180	6.05	1.62	.019	.036	.533	.010	4.28	1.15	.035	.128	52.59
dch09-1442	II	4	33.79	.194	6.05	1.68	.026	.065	.580	.043	3.76	1.07	.020	.092	52.99
dch09-1443	II	3	34.36	.144	5.94	1.25	.013	.043	.399	.028	4.77	1.66	.026	.054	52.19
dch09-1443	I	17	33.63	.192	6.03	1.62	.023	.067	.566	.058	4.69	1.18	.028	.083	52.58
dch09-1444	II	9	34.05	.138	5.94	1.39	.026	.031	.432	.035	5.03	1.48	.031	.137	51.93
dch09-1444	I	10	33.60	.191	6.03	1.72	.030	.055	.564	.064	4.95	1.53	.029	.159	51.93
dch09-1446	I	2	34.29	.061	6.41	0.80	.045	.032	.410	.018	4.41	2.31	.119	.071	51.40
dch09-1446	IIa	1	34.21	.111	6.44	0.85	.022	.067	.485	.037	4.36	2.14	.096	.066	51.36
dch09-1446	IIb	1	33.90	.100	6.28	0.85	.022	.069	.505	.120	5.27	1.65	.087	.075	51.00
dch09-1447	R2	3	33.96	.146	5.93	1.27	.015	.036	.420	.026	5.01	1.21	.040	.137	52.29
dch09-1447	R1	17	33.70	.192	6.03	1.61	.026	.068	.565	.049	4.47	1.07	.030	.115	52.73
dch09-1478	II	1	34.26	.130	5.94	1.57	.015	.046	.474	.087	3.68	1.00	.023	.044	52.88
dch09-1478	R1	19	33.98	.181	5.96	1.81	.022	.050	.592	.079	3.48	1.13	.017	.053	52.81
dch09-1486	IIIa	1	34.44	.199	5.89	1.16	.006	.044	.392	.089	3.46	1.35	.029	.127	52.73
dch09-1486	IIIb	1	34.71	.187	5.96	1.25	.033	.047	.418	.005	2.77	1.64	.019	.039	52.91
dch09-1486	II	2	34.09	.155	6.00	1.32	.025	.046	.447	.054	3.13	1.44	.023	.069	52.94
dch09-1486	I	16	34.06	.202	6.11	1.54	.024	.069	.552	.067	2.88	1.40	.022	.048	52.94
dch09-1488		12	33.83	.173	5.97	1.75	.031	.038	.526	.066	3.55	1.12	.024	.086	52.80

dch09-1490	I	10	34.28	.152	5.93	1.51	.027	.036	.462	.056	3.78	1.15	.026	.103	52.75
dch09-1490	II	7	34.00	.191	5.98	1.79	.025	.052	.523	.064	3.64	1.14	.021	.141	52.75
dch09-1491		20	34.22	.127	5.96	1.44	.028	.020	.463	.048	4.60	1.65	.041	.205	51.60
dch91-01		8	33.02	.141	5.91	1.34	.023	.044	.413		4.66	0.83	.027	.069	
dch91-02		10	32.01	.144	5.82	1.28	.024	.044	.391		4.68	0.98	.031	.125	
dch91-03		9	32.14	.212	5.89	1.49	.029	.091	.544		4.53	0.96	.015	.100	
dch91-04		9	32.39	.138	6.11	1.31	.028	.047	.416		4.59	0.97	.029	.122	
dch91-05		8	32.39	.140	5.80	1.28	.017	.042	.394		4.81	0.92	.032	.125	
F10-071GC	R	19	33.80	.171	6.04	0.97	.042	.083	.370	.006	4.23	2.21	.111	.000	50.19
F10-071GC	II	1	33.07	.208	5.89	1.51	.039	.086	.546	.004	3.72	2.10	.040	.000	50.50
F10-255GC		19	33.40	.153	5.85	1.13	.016	.054	.391	.008	4.99	1.72	.030	.000	50.22
F10-282GC	R1	18	33.48	.101	5.87	1.25	.025	.022	.345	.006	4.50	1.73	.053	.000	50.54
F10-282GC	R2	2	32.97	.196	5.94	1.57	.026	.077	.559	.011	4.00	1.97	.036	.000	50.56
F11-145GC	II	2	33.88	.105	5.97	1.34	.026	.023	.404	.099	4.18	1.68	.051	.147	51.85
F11-145GC	I	18	33.68	.118	6.05	1.47	.027	.031	.452	.048	4.18	1.67	.043	.032	51.86
F11-183GC	II	3	33.45	.148	5.94	1.43	.030	.040	.439	.035	6.11	1.27	.043	-.049	50.46
F11-183GC	I	16	32.90	.173	6.11	1.92	.034	.066	.613	.097	5.53	1.58	.034	.350	50.63
gc09-1460		20	33.70	.095	5.98	1.00	.022	.034	.374	.006	6.14	0.54	.071	.058	52.79
gc09-1461	I	19	33.64	.141	5.87	1.29	.018	.038	.404	.023	6.14	0.81	.033	.138	52.28
gc09-1461	II	1	33.45	.157	6.00	1.47	.023	.041	.485	.019	5.99	0.66	.039	.151	52.25
gc09-1462	IIa	1	33.28	.135	5.90	1.36	.000	.042	.428	.050	6.47	0.83	.032	.142	51.93
gc09-1462	IIb	1	33.64	.145	5.89	1.41	.012	.027	.407	.048	6.60	0.85	.045	.202	51.96
gc09-1462	IIc	1	33.24	.207	6.03	1.47	.032	.073	.544	.102	6.35	0.81	.023	.124	52.25
gc09-1462	I	16	33.02	.211	6.05	1.59	.021	.093	.598	.051	6.11	0.83	.027	.148	52.23
gc09-1462dup	IIa	1	33.10	.123	5.90	1.36	.056	.045	.402	.106	6.37	0.93	.021	.097	50.64
gc09-1462dup	IIb	1	33.09	.220	6.06	1.45	.020	.088	.531	.071	6.31	1.11	.043	.121	51.07
gc09-1462dup	I	18	32.93	.223	6.09	1.57	.028	.091	.586	.065	6.10	0.81	.026	.140	51.16
gc09-1463	I	12	33.76	.142	5.88	1.35	.017	.033	.424	.031	6.03	0.77	.028	.144	52.25
gc09-1463	III	1	33.63	.150	5.94	1.54	.025	.057	.566	.025	5.12	0.47	.031	.064	52.63
gc09-1463	II	7	33.26	.171	5.95	1.73	.023	.064	.598	.058	5.81	0.80	.028	.154	52.15
gc94-720		26	33.57	.188	5.91	1.74	.026	.050	.580	.089	5.49	1.15	.018	.202	50.17
gc96-949	I	18	34.46	.136	6.26	1.48	.033	.058	.436	.052	5.30	1.45	.038	.231	50.97
gc96-949	II	2	34.26	.175	6.27	1.69	.029	.072	.524	.036	4.97	1.51	.016	.218	52.13
gc96-950	III	4	34.71	.158	6.27	1.55	.028	.053	.452	.079	5.08	1.73	.031	.157	50.35
gc96-950	II	5	34.21	.182	6.34	1.76	.037	.080	.581	.072	5.14	1.68	.032	.159	49.51
gc96-950	IV	3	34.20	.178	6.38	2.01	.021	.090	.701	.080	4.95	1.86	.033	.203	49.40
gc96-950	I	7	33.84	.218	6.47	2.28	.051	.114	.826	.053	4.69	2.01	.034	.191	49.96
gc96-950	V	1	33.20	.263	6.58	2.72	.047	.162	.997	.033	4.73	1.91	.021	.229	49.33
gc96-952		21	34.48	.195	6.44	1.69	.027	.083	.586	.056	5.08	1.85	.026	.339	49.71
gc96-954	II	6	34.96	.142	6.38	1.35	.020	.075	.440	.057	4.90	1.99	.048	.156	50.26
gc96-954	I	13	34.44	.200	6.37	1.75	.028	.092	.598	.055	4.73	2.03	.041	.183	49.99
gc96-954	III	1	33.98	.227	6.43	2.21	.046	.091	.759	.085	4.25	2.39	.038	.184	49.60
gc96-955	II	5	34.71	.194	6.24	1.33	.010	.093	.485	.065	4.71	1.70	.042	.209	50.74
gc96-955	I	15	34.37	.212	6.38	1.54	.028	.116	.583	.061	4.38	1.91	.040	.220	51.16
gc96-956		20	34.28	.200	6.44	1.63	.027	.086	.565	.047	4.62	1.65	.024	.254	51.82
gc96-957	II	4	34.58	.140	6.28	1.27	.026	.054	.418	.049	5.24	1.44	.032	.250	52.45
gc96-957	I	16	34.11	.188	6.36	1.63	.027	.081	.565	.059	4.93	1.43	.028	.252	52.06
gc96-958	II	3	34.11	.196	6.40	1.78	.032	.094	.614	.037	4.52	1.73	.016	.251	52.48
gc96-958	I	15	33.75	.234	6.47	1.94	.031	.115	.731	.061	4.29	1.65	.022	.270	52.53

gc96-958	III	2	33.07	.284	6.73	2.46	.034	.170	.961	.046	3.98	1.86	.024	.292	52.51
gc96-959	III	1	34.14	.234	6.44	1.78	.033	.097	.605	.026	4.46	1.68	.033	.256	51.56
gc96-959	II	9	33.85	.223	6.55	1.96	.040	.120	.726	.049	4.37	1.74	.028	.258	51.60
gc96-959	I	10	33.24	.275	6.72	2.43	.041	.173	.974	.045	4.05	1.83	.027	.268	51.52
gc96-960	II	6	34.13	.205	6.38	1.52	.026	.090	.538	.073	4.79	1.51	.021	.241	51.37
gc96-960	I	14	33.85	.237	6.50	1.76	.024	.105	.646	.052	4.62	1.55	.026	.227	51.25
gc96-961	II	8	34.50	.145	6.33	1.33	.014	.060	.419	.032	4.95	1.53	.029	.244	51.30
gc96-961	I	11	34.07	.193	6.49	1.78	.025	.092	.627	.061	4.35	1.69	.035	.257	51.84
gc96-962	II	6	34.57	.138	6.29	1.30	.017	.057	.425	.033	5.17	1.37	.036	.261	51.43
gc96-962	III	3	34.34	.180	6.45	1.56	.048	.073	.547	.061	4.42	1.65	.034	.226	51.55
gc96-962	I	11	33.86	.200	6.46	1.75	.027	.093	.623	.070	4.51	1.68	.030	.256	51.61
gc96-963	III	2	34.81	.126	6.43	1.28	.013	.065	.387	.030	5.00	1.42	.032	.208	51.69
gc96-963	II	4	34.30	.188	6.44	1.55	.026	.084	.527	.058	4.72	1.62	.033	.236	52.17
gc96-963	I	13	33.99	.219	6.56	1.82	.029	.119	.678	.049	4.30	1.69	.025	.251	51.94
gc96-963dup	II	4	34.59	.159	6.34	1.35	.011	.057	.429	.045	4.93	1.54	.029	.216	51.68
gc96-963dup	III	3	34.18	.222	6.57	1.63	.040	.084	.572	.073	4.51	1.70	.032	.242	51.91
gc96-963dup	I	11	33.93	.239	6.50	1.81	.031	.114	.686	.047	3.85	1.28	.028	.254	52.55
gc96-964	II	4	34.49	.200	6.39	1.42	.016	.083	.484	.056	4.72	1.53	.019	.257	51.63
gc96-964	I	16	33.92	.222	6.43	1.61	.030	.102	.587	.059	4.57	1.56	.028	.243	51.69
gc96-965	III	1	34.47	.172	6.39	1.25	.008	.084	.450	.086	4.46	1.77	.017	.230	52.47
gc96-965	II	3	34.07	.218	6.31	1.50	.022	.096	.524	.074	4.69	1.60	.017	.245	51.77
gc96-965	I	15	33.98	.223	6.48	1.62	.034	.114	.611	.043	4.39	1.74	.025	.224	52.11
gc96-966		20	34.08	.224	6.55	1.63	.028	.110	.605	.044	4.51	1.67	.025	.281	52.68
gc96-967	III	4	34.92	.138	6.33	1.04	.025	.070	.383	.057	4.80	1.53	.036	.253	51.87
gc96-967	II	5	34.46	.157	6.37	1.27	.020	.075	.430	.066	4.88	1.51	.035	.280	51.71
gc96-967	IV	1	34.17	.213	6.61	1.40	.029	.101	.509	.079	4.73	1.73	.013	.350	52.10
gc96-967	I	9	34.04	.207	6.48	1.55	.031	.109	.577	.049	4.51	1.65	.025	.267	52.01
gc96-968		19	34.45	.151	6.26	1.51	.032	.058	.456	.071	5.38	1.42	.035	.382	51.06
gc96-969	III	3	34.57	.166	6.24	1.52	.037	.047	.494	.101	5.33	1.51	.033	.149	50.23
gc96-969	I	8	34.29	.179	6.30	1.77	.043	.073	.605	.060	5.20	1.55	.039	.226	50.26
gc96-969	IV	2	33.97	.182	6.36	2.05	.038	.082	.688	.070	5.14	1.50	.026	.254	51.08
gc96-969	II	6	33.68	.233	6.47	2.29	.049	.121	.859	.037	4.76	1.71	.033	.273	50.21
gc96-970	II	6	34.87	.143	6.33	1.15	.018	.065	.369	.022	5.49	1.62	.038	.256	50.53
gc96-970	I	13	34.63	.141	6.32	1.29	.015	.063	.403	.022	5.41	1.64	.034	.295	50.61
gc96-971	I	12	34.50	.133	6.29	1.18	.026	.062	.368	.029	5.41	1.49	.045	.220	50.84
gc96-971	II	8	34.35	.141	6.29	1.38	.017	.076	.449	.080	5.21	1.58	.044	.246	50.84
gc96-972		6	34.77	.160	6.23	1.36	.026	.067	.442	.059	5.36	1.78	.038	.101	49.85
gc96-972dup		20	35.08	.171	6.33	1.38	.026	.066	.446	.074	5.08	1.83	.042	.134	50.14
gc96-973	II	6	35.13	.162	6.34	1.38	.032	.063	.464	.059	5.13	1.78	.047	.165	50.57
gc96-973	I	13	34.67	.195	6.36	1.77	.031	.084	.606	.050	5.24	1.64	.032	.161	50.24
gc96-973	III	1	34.23	.224	6.37	2.28	.033	.098	.793	.042	5.22	1.64	.032	.101	50.17
GCDC-44	II	7	33.37	.131	5.97	1.41	.033	.037	.412	.028	6.27	1.21	.042	.377	50.42
GCDC-44	I	12	33.12	.135	6.00	1.57	.028	.045	.462	.083	6.09	1.24	.039	.194	50.47
GCDC-46	II	1	33.58	.099	6.04	1.21	.019	.031	.357	.000	6.06	1.62	.092	.425	50.58
GCDC-46	I	19	33.47	.106	6.05	1.34	.022	.032	.386	.030	5.71	1.61	.072	.241	50.19
GCDC-46dup	II	1	33.42	.075	6.02	1.20	.024	.013	.345	.084	5.72	1.40	.101	.224	50.41
GCDC-46dup	R1	19	33.48	.106	6.01	1.35	.019	.031	.392	.006	5.48	1.32	.079	.256	50.74
GCDC-47	I	10	33.57	.197	5.92	1.46	.025	.093	.486	.091	5.10	1.59	.022	.145	50.65
GCDC-47	II	9	33.18	.276	6.12	1.72	.027	.125	.638	.043	4.64	2.03	.030	.279	50.69

gcj91-05	II	2	33.92	.087	6.07	1.07	.026	.019	.384		5.99	0.68	.090	.260	
gcj91-05	I	3	33.49	.149	6.26	1.37	.007	.069	.454		5.80	0.63	.046	.120	
gcj91-05	III	1	32.28	.198	6.22	2.11	.042	.104	.646		3.32	0.13	.019	.010	
gcj91-07	R	8	34.40	.134	6.19	1.38	.023	.036	.418		5.99	0.75	.047	.117	
grc09-1456		19	34.47	.032	6.40	0.77	.022	.008	.416	.013	4.42	2.43	.128	.003	51.52
grc09-1458		20	33.89	.152	5.89	1.07	.020	.054	.395	.021	5.53	1.42	.037	.152	51.73
grc09-1464	II	2	33.72	.139	5.84	1.44	.038	.030	.438	.021	5.40	1.48	.040	.140	51.63
grc09-1464	I	18	33.71	.144	5.96	1.59	.026	.030	.478	.059	5.00	1.73	.037	.177	51.80
grc09-1465		18	34.04	.152	5.95	1.35	.024	.048	.443	.070	4.57	1.86	.045	.130	52.03
grc09-1466	II	1	33.46	.148	6.17	1.19	.000	.080	.591	.062	4.79	1.79	.056	.105	50.63
grc09-1466	I	7	33.51	.146	6.24	1.33	.026	.077	.614	.065	4.36	1.95	.058	.102	50.63
grc09-1467		19	33.89	.089	6.04	1.12	.020	.024	.355	.008	4.91	1.88	.074	.173	50.64
grc09-1468	IIa	1	33.90	.051	6.09	1.05	.042	.033	.389	.021	4.88	1.80	.051	.121	50.83
grc09-1468	I	17	34.01	.115	5.99	1.22	.026	.032	.378	.031	5.11	1.74	.054	.144	50.69
grc09-1468	IIb	1	33.56	.129	6.05	1.44	.026	.080	.625	.072	5.10	1.71	.037	.110	50.48
grc09-1469	R	19	33.75	.121	6.01	1.35	.028	.028	.410	.022	4.78	1.86	.041	.154	50.61
grc09-1473	IIa	4	33.00	.145	6.01	2.12	.052	.011	.539	.060	4.06	0.78	.034	.043	52.06
grc09-1473	I	7	32.60	.179	6.10	2.43	.067	.014	.654	.115	3.77	0.82	.031	.080	52.14
grc09-1473	IIb	4	32.44	.212	6.17	2.78	.071	.020	.752	.089	3.62	0.71	.024	.077	52.06
grc09-1473	III	2	32.05	.241	6.17	2.97	.086	.040	.854	.180	3.49	0.76	.029	.091	52.06
grc09-1474	IIa	1	33.60	.122	6.08	1.53	.039	.041	.432	.042	4.59	0.51	.056	.091	52.26
grc09-1474	IIb	1	33.05	.132	6.26	1.81	.041	.074	.554	.075	4.33	0.58	.025	.000	51.98
grc09-1474	IIc	1	31.95	.205	6.45	1.99	.036	.077	.619	.126	4.56	0.64	.033	.143	51.77
grc09-1474	I	17	32.31	.205	6.37	2.19	.042	.099	.686	.104	4.19	0.53	.024	.088	51.96
grc09-1475	I	15	33.73	.108	6.02	1.23	.021	.030	.391	.022	4.98	1.72	.049	.188	50.82
grc09-1475	II	5	33.49	.101	6.06	1.34	.021	.033	.429	.072	4.60	1.88	.051	.189	51.02
grc09-1476	R2	4	33.99	.114	6.05	1.24	.032	.030	.402	.043	4.82	1.86	.051	.199	50.88
grc09-1476	R1	16	33.80	.133	6.09	1.36	.021	.033	.434	.053	4.77	1.87	.055	.172	50.83
grc09-1477		20	33.82	.119	6.03	1.15	.018	.038	.369	.008	5.86	1.38	.064	.194	50.59
grc09-1480	I	15	33.76	.179	6.04	1.33	.026	.053	.417	.014	6.03	0.83	.034	.191	51.86
grc09-1480	II	6	33.72	.212	6.13	1.59	.022	.062	.480	.023	5.56	0.57	.025	.190	52.42
grc09-1494		19	34.19	.042	6.16	0.68	.045	.030	.255	.000	4.73	2.39	.100	.179	50.45
grc09-1495	I	10	31.75	.256	7.18	1.99	.123	.209	.595	.030	4.05	3.06	.178	.182	50.81
grc09-1495	III	1	32.38	.272	7.55	2.12	.111	.246	.691	.000	2.98	4.31	.178	.198	50.49
grc09-1495	II	2	30.53	.354	7.39	2.58	.124	.342	1.010	.073	3.96	2.32	.144	.071	50.78
grc09-1497	III	1	33.66	.161	5.86	1.38	.049	.051	.412	.084	6.26	1.09	.035	.024	49.85
grc09-1497	II	2	33.62	.130	5.93	1.44	.036	.048	.415	.083	5.34	1.77	.036	.031	50.42
grc09-1497	I	15	33.40	.147	5.99	1.53	.028	.051	.449	.081	5.65	1.62	.034	.193	49.95
grc09-1499		20	34.09	.112	6.04	1.35	.026	.022	.393	.004	6.05	1.11	.071	.220	50.79
grc09-1500		20	33.70	.170	6.25	1.38	.022	.068	.469	.040	6.36	0.90	.044	.180	50.81
grc09-1504	I	19	34.20	.108	6.02	1.32	.020	.021	.379	.003	6.13	0.94	.069	.198	50.71
grc09-1504	II	1	34.08	.158	6.05	1.57	.033	.076	.464	.011	6.39	1.08	.037	.174	49.64
grc09-1505		21	34.63	.124	5.97	1.22	.022	.033	.359	.011	5.69	1.44	.045	.197	50.54
grc09-1511		18	34.52	.131	6.09	1.37	.026	.035	.431	.038	4.82	1.90	.050	.177	50.43
grc09-1513	I	12	34.21	.145	6.04	1.38	.022	.038	.423	.046	4.75	1.79	.030	.175	50.45
grc09-1513	II	8	33.66	.193	6.14	1.77	.029	.069	.598	.058	4.51	1.90	.025	.167	50.40
grc09-1514		20	34.17	.160	6.08	1.31	.026	.043	.409	.014	4.83	1.73	.033	.182	50.71
grc09-1517		13	34.15	.151	6.04	1.33	.026	.045	.418	.035	5.22	1.61	.032	.164	50.75
grc09-1518		18	34.49	.110	6.10	0.94	.025	.048	.327	.007	5.30	1.69	.074	.164	50.56

grc10-1583	II	3	32.58	.117	5.79	1.34	.025	.028	.396	.054	6.00	1.07	.028	.151	49.39
grc10-1583	I	17	32.45	.159	5.87	1.45	.022	.045	.437	.045	6.03	1.11	.033	.182	49.14
grc10-1584		12	34.13	.037	6.38	0.75	.014	.013	.390	.000	4.56	2.49	.149	.408	50.64
grc10-1585		20	33.12	.178	5.92	1.77	.020	.062	.582	.109	5.73	1.12	.023	.212	49.91
grc10-1588	R	19	33.20	.135	5.85	1.54	.025	.029	.450	.008	5.20	1.59	.036	.000	49.73
grc10-1590	R	20	33.22	.133	5.84	1.52	.027	.029	.449	.011	5.13	1.62	.035	.000	49.61
grc10-1591	II	9	33.53	.123	5.84	1.44	.021	.028	.413	.005	5.19	1.61	.043	.000	49.36
grc10-1591	I	10	33.33	.142	5.85	1.56	.022	.031	.461	.005	4.86	1.76	.042	.000	49.39
grc10-1592		20	32.90	.231	6.19	1.75	.030	.107	.632	.129	5.78	1.18	.031	.179	50.27
grc10-1596	R2	8	33.32	.133	5.81	1.39	.019	.032	.410	.016	5.38	1.42	.037	.000	49.59
grc10-1596	I	12	32.80	.166	5.97	1.88	.030	.044	.588	.006	4.66	1.81	.034	.000	49.56
grc10-1600		18	33.48	.091	5.94	1.01	.014	.031	.351	.002	5.76	1.34	.066	.000	49.85
grc10-1601		19	33.48	.094	5.93	1.01	.018	.032	.346	.008	5.72	1.38	.066	.000	49.58
grc10-1601		19	33.48	.094	5.93	1.01	.018	.032	.346	.008	5.72	1.38	.066	.000	49.58
grc10-1602		19	32.92	.173	5.93	1.25	.022	.070	.459	.005	6.10	0.99	.037	.000	49.70
grc10-1602		19	32.92	.173	5.93	1.25	.022	.070	.459	.005	6.10	0.99	.037	.000	49.70
grc10-1606		20	32.82	.096	5.82	0.98	.019	.038	.361	.007	6.01	1.07	.070	.000	49.80
grc10-1608	II	2	32.97	.122	5.69	1.34	.026	.026	.394	.022	5.57	1.26	.032	.000	49.40
grc10-1608	I	19	32.59	.171	5.97	1.89	.038	.049	.597	.004	4.55	1.89	.031	.000	49.79
grc10-1609		18	33.34	.131	5.83	1.32	.027	.027	.397	.005	5.93	1.04	.037	.000	50.19
grc96-975		19	34.06	.054	6.23	0.68	.027	.031	.319	.019	5.10	1.31	.081	.080	51.26
grc96-976	II	8	33.95	.153	5.82	1.83	.035	.009	.447	.053	4.25	0.85	.038	.126	50.98
grc96-976	I	9	33.44	.163	5.90	2.07	.045	.014	.524	.080	4.17	0.92	.030	.193	50.74
grc96-976	III	2	33.37	.181	5.97	2.28	.044	.007	.591	.073	4.09	0.70	.036	.094	50.69
grc96-976	IV	1	32.86	.174	5.99	2.59	.092	.022	.684	.103	3.85	0.81	.035	.416	50.64
grc96-977	II	2	33.38	.178	6.01	2.37	.074	.020	.613	.084	4.25	0.79	.041	.327	50.98
grc96-977	I	18	32.95	.191	6.07	2.64	.068	.023	.710	.112	3.94	0.72	.028	.161	51.22
grc96-978	II	5	33.26	.177	6.08	2.45	.055	.013	.649	.082	4.12	0.66	.033	.166	50.62
grc96-978	I	15	32.78	.203	6.13	2.79	.072	.023	.764	.111	3.84	0.61	.030	.191	50.63
grc96-979		19	33.21	.160	6.07	2.39	.062	.018	.618	.078	4.15	0.61	.031	.175	51.10
grc96-980	III	1	33.88	.167	5.81	1.77	.058	.006	.440	.070	4.39	0.52	.043	.097	51.52
grc96-980	II	5	33.70	.125	5.97	1.99	.051	.015	.506	.053	4.30	0.55	.034	.132	51.59
grc96-980	I	14	33.36	.158	6.06	2.22	.047	.011	.576	.071	4.16	0.53	.031	.155	51.51
grc96-981	II	9	34.18	.126	5.90	1.74	.045	.008	.436	.018	4.62	0.64	.036	.178	51.13
grc96-981	I	10	33.63	.150	6.04	2.13	.058	.015	.547	.061	4.52	0.67	.032	.185	51.17
grc96-981	III	1	33.39	.180	6.12	2.36	.061	.009	.585	.114	4.20	0.59	.024	.138	50.99
grc96-982		20	34.34	.135	5.94	1.74	.045	.015	.439	.025	4.50	0.52	.037	.136	51.71
grc96-983	IIa	1	34.44	.110	6.04	1.43	.032	.036	.408	.042	4.52	0.52	.035	.156	52.19
grc96-983	IIb	1	33.96	.149	6.15	1.70	.033	.041	.490	.000	4.55	0.47	.044	.108	51.65
grc96-983	I	18	33.62	.151	6.22	1.92	.049	.051	.519	.060	4.60	0.56	.033	.177	51.69
grc96-984	III	1	34.14	.127	5.98	1.72	.061	.000	.326	.057	4.38	0.88	.068	.184	51.95
grc96-984	I	10	32.86	.218	6.09	2.93	.073	.063	.846	.084	3.47	0.61	.028	.213	51.56
grc96-984	II	8	31.90	.250	6.19	3.63	.094	.079	1.150	.078	3.15	0.59	.031	.195	51.62
hsy09-1520		16	33.87	.080	6.09	1.28	.022	.009	.419	.003	6.42	0.77	.088	.219	50.84
hsy09-1522		18	33.75	.078	6.09	1.17	.026	.013	.401	.003	6.19	0.84	.096	.260	51.01
hsy09-1527		16	33.80	.078	6.05	1.20	.022	.014	.404	.002	6.30	1.07	.088	.257	50.46
hsy09-1529	II	4	33.56	.104	6.09	1.17	.017	.047	.426	.041	6.14	1.10	.058	.213	50.68
hsy09-1529	I	16	33.78	.136	6.15	1.26	.023	.054	.480	.040	5.88	1.25	.056	.196	50.76
hsy09-1535		20	33.93	.107	6.05	1.33	.021	.024	.396	.002	5.68	1.44	.070	.229	50.63

hsy09-1537		20	34.21	.103	6.10	1.06	.017	.036	.374	.006	5.44	1.56	.067	.191	50.71
hsy09-1539		20	34.41	.168	6.01	1.13	.022	.054	.397	.027	5.33	1.51	.031	.181	50.72
hsy09-1542		20	34.38	.087	6.10	1.03	.023	.035	.367	.004	5.60	1.46	.072	.222	50.62
hsy09-1544		17	34.32	.119	6.05	1.35	.025	.032	.432	.030	5.14	1.66	.054	.197	50.46
hsy09-1549	R	9	33.64	.151	6.15	1.44	.019	.042	.419	.022	6.25	1.26	.042	.156	50.44
hsy09-1570	II	1	33.94	.112	5.95	1.22	.019	.008	.370	.031	6.20	0.96	.078	.196	51.26
hsy09-1570	I	19	33.93	.110	6.03	1.39	.030	.025	.401	.005	6.13	1.02	.073	.201	51.15
hsy09-1574	II	1	34.33	.119	5.96	1.22	.024	.038	.361	.000	6.05	1.16	.047	.150	51.19
hsy09-1574	I	19	33.75	.168	6.11	1.39	.024	.066	.444	.028	6.12	1.09	.037	.180	51.41
hsy94-715	III	4	34.34	.132	6.01	1.24	.031	.041	.368	.064	5.41	1.51	.050	.198	51.44
hsy94-715	I	10	34.25	.148	6.02	1.38	.030	.056	.456	.133	5.18	1.51	.044	.201	51.42
hsy94-715	II	6	34.02	.183	6.07	1.68	.030	.072	.615	.099	4.44	1.70	.045	.186	51.24
hsy94-715dup	III	4	34.15	.135	5.95	1.21	.017	.038	.375	.032	5.78	1.28	.049	.209	50.34
hsy94-715dup	I	21	34.12	.147	5.97	1.36	.023	.051	.442	.111	5.32	1.43	.043	.192	50.67
hsy94-715dup	IV	1	33.86	.142	6.08	1.70	.010	.080	.597	.079	4.64	1.63	.034	.217	50.48
hsy94-715dup	II	5	33.38	.228	6.15	2.03	.039	.108	.772	.062	4.20	1.82	.035	.206	50.37
hsy94-716		21	34.08	.196	6.08	1.76	.036	.074	.614	.054	5.18	1.66	.048	.099	49.89
hsy94-717	II	3	34.92	.152	6.06	1.40	.038	.058	.443	.060	5.54	1.57	.057	.144	48.87
hsy94-717	I	17	34.55	.186	6.12	1.77	.032	.074	.580	.056	4.98	1.78	.044	.199	49.51
jnc09-1449		17	34.48	.110	6.05	0.86	.040	.045	.293	.022	4.41	2.16	.102	.133	52.53
jnc09-1450		19	34.38	.116	6.03	0.86	.049	.046	.295	.024	4.64	2.09	.099	.147	52.03
jnc09-1479	R	20	34.09	.150	5.92	1.54	.031	.044	.459	.072	4.84	1.68	.033	.173	51.64
jnc10-1593	I	9	33.45	.149	5.90	1.31	.031	.052	.406	.045	5.94	1.26	.034	.219	49.79
jnc10-1593	III	2	33.08	.183	6.04	1.54	.008	.068	.491	.146	5.94	1.42	.034	.074	49.17
jnc10-1593	II	6	32.81	.168	6.11	1.70	.030	.092	.596	.097	5.49	1.59	.035	.208	49.89
JO11-12		20	33.89	.111	5.92	0.90	.018	.042	.305	.006	4.84	1.89	.072	.000	49.45
JO11-13		19	33.83	.108	5.92	1.29	.030	.028	.364	.009	4.68	2.03	.049	.000	49.58
js09-1451	I	17	33.80	.118	5.86	1.33	.029	.026	.419	.014	5.24	0.93	.040	.113	53.15
js09-1452	II	5	33.92	.027	6.21	0.78	.009	.020	.383	.012	5.38	1.31	.109	.126	52.47
js09-1452	I	15	33.82	.124	5.90	1.33	.022	.025	.413	.019	4.89	0.98	.040	.126	53.17
js09-1453		18	34.06	.032	6.30	0.73	.018	.007	.391	.004	5.16	1.90	.112	.034	51.51
js09-1454	I	17	34.47	.047	6.42	0.91	.019	.012	.412	.004	4.20	2.61	.092	.135	51.64
js09-1454	II	1	34.16	.022	6.35	1.51	.026	.013	.386	.005	4.20	2.53	.055	.134	51.25
M10GC-088	I	10	33.01	.180	5.82	1.30	.031	.065	.447	.085	4.60	1.80	.044	.137	49.57
M10GC-088	II	9	32.72	.198	5.91	1.48	.029	.084	.553	.067	4.44	1.84	.042	.136	49.45
M10GC-088	III	1	32.16	.229	5.97	1.96	.041	.106	.755	.056	4.07	2.06	.025	.107	49.12
M10GC-097	I	8	32.51	.157	5.92	1.62	.034	.057	.527	.064	4.64	1.80	.035	.033	49.42
M10GC-097	IV	2	32.77	.135	5.89	1.17	.014	.032	.389	.036	5.02	1.40	.047	.000	49.44
M10GC-097	II	4	32.84	.134	5.84	1.34	.025	.033	.411	.050	4.94	1.57	.041	.026	49.65
M10GC-097	III	3	32.57	.105	5.85	1.47	.009	.034	.451	.074	5.02	1.67	.042	.045	49.60
M10GC-099	R2	5	32.86	.091	5.83	1.17	.025	.026	.326	.019	4.48	1.59	.058	.135	50.19
M10GC-099	R1	7	32.70	.095	5.86	1.30	.042	.028	.349	.036	4.39	1.57	.058	.107	50.32
M10GC-173	I	18	33.02	.212	5.99	1.50	.028	.086	.553	.058	4.21	2.08	.033	.132	49.22
M10GC-173	II	1	32.58	.219	6.07	1.86	.016	.126	.700	.038	4.00	2.19	.022	.191	48.87
M10GC-328	II	1	32.77	.136	6.28	0.88	.029	.081	.711	.116	5.15	1.10	.045	.082	49.27
M10GC-328	I	2	32.41	.132	6.28	0.95	.036	.113	.851	.138	5.06	1.06	.085	.080	49.88
M10GC-352	II	3	33.27	.177	5.90	1.23	.014	.058	.404	.052	4.42	1.86	.033	.137	49.43
M10GC-352	IV	1	33.26	.144	5.91	1.37	.024	.049	.426	.069	4.24	2.02	.055	.123	49.01
M10GC-352	I	12	32.99	.210	6.02	1.51	.029	.087	.567	.066	4.26	2.04	.035	.122	49.19

M10GC-352	III	2	32.41	.227	6.12	2.03	.034	.105	.714	.047	4.03	2.28	.036	.102	49.13
M10GC-354	R1	11	32.97	.187	6.03	1.49	.033	.069	.515	.083	4.41	2.06	.022	.150	49.28
M10GC-354	R2	5	32.73	.214	6.16	1.74	.035	.098	.640	.067	4.32	2.15	.024	.140	49.08
M10GC-354	III	2	31.90	.244	6.33	2.29	.022	.148	.897	.064	4.10	2.29	.021	.184	48.74
M10GC-355	R	11	32.96	.158	5.99	1.52	.028	.045	.552	.065	4.68	1.87	.034	.000	48.82
M10GC-357	IIa	1	33.22	.040	6.30	0.86	.044	.020	.301	.000	4.94	2.02	.170	.052	49.16
M10GC-357	IIb	1	33.24	.077	6.08	1.07	.025	.007	.393	.000	4.97	1.89	.115	.312	48.78
M10GC-357	R1	8	33.08	.139	5.97	1.56	.021	.025	.485	.071	4.71	1.88	.043	.159	48.91
M10GC-358	III	1	33.31	.187	5.86	1.25	.003	.027	.409	.020	4.94	1.65	.024	.130	49.06
M10GC-358	II	3	33.24	.159	5.91	1.41	.020	.045	.429	.109	4.92	1.77	.035	.190	48.93
M10GC-358	I	16	33.08	.158	5.92	1.51	.023	.052	.470	.077	4.88	1.76	.022	.144	49.02
M10GC-373	II	1	32.92	.134	5.87	1.27	.017	.039	.390	.031	6.00	1.09	.026	.000	48.77
M10GC-373	R1	8	32.92	.141	5.91	1.47	.028	.037	.426	.051	5.39	1.53	.032	.002	48.59
M10GC-374		20	33.18	.114	5.90	1.30	.019	.027	.391	.018	5.46	1.50	.045	.128	48.94
M10GC-377		20	33.16	.135	5.92	1.25	.024	.042	.383	.030	5.14	1.64	.037	.165	49.36
M10GC-424		13	32.96	.102	5.94	0.93	.016	.040	.354	.003	6.01	0.84	.074	.054	49.29
M10GC-449	II	1	33.71	.070	6.10	1.11	.066	.000	.175	.000	4.54	2.66	.158	.000	49.99
M10GC-449	I	11	33.54	.100	5.92	1.32	.027	.022	.379	.004	5.49	1.58	.073	.000	50.18
M10GC-482	I	14	33.23	.124	5.93	1.21	.015	.029	.372	.007	6.32	0.97	.053	.000	50.24
M10GC-482	II	1	32.37	.202	5.80	2.05	.028	.019	.573	.002	6.07	0.81	.044	.000	50.30
M10GC-532	IIIa	1	33.12	.130	5.81	1.25	.016	.032	.334	.011	5.22	1.63	.054	.136	48.87
M10GC-532	I	8	32.84	.131	6.05	1.48	.033	.035	.405	.043	4.86	1.93	.048	.099	48.93
M10GC-532	II	6	32.40	.154	6.25	1.75	.045	.053	.495	.062	4.88	2.05	.043	.167	48.72
M10GC-532	IIIb	1	32.33	.165	6.45	1.99	.052	.061	.584	.065	4.65	2.30	.039	.141	48.48
MW10GC-21	II	1	33.40	.147	5.93	1.83	.034	.017	.451	.010	4.31	2.24	.033	.000	49.34
MW10GC-21	I	12	32.49	.189	5.96	2.19	.040	.036	.606	.002	4.16	2.02	.035	.000	50.25
RPS 72-24		19	34.42	.103	6.17	0.86	.027	.044	.335	.015	4.82	1.62	.134	.195	50.84
RPS 73-20		21	33.61	.122	6.06	1.32	.025	.036	.432	.016	6.03	1.00	.040	.161	50.79
RPS 73-21	R	20	33.72	.118	6.06	1.26	.021	.030	.422	.010	5.91	0.94	.040	.145	50.95
RPS 73-26		7	33.94	.113	6.08	1.31	.029	.031	.424	.007	5.80	0.74	.046	.176	51.49
RPS 73-27	IIa	1	34.13	.110	6.13	1.01	.000	.030	.360	.030	5.72	1.41	.080	.280	49.37
RPS 73-27	IIb	1	34.11	.110	6.04	1.28	.000	.020	.400	.010	4.95	1.42	.050	.170	50.32
RPS 73-27	I	12	33.81	.123	5.99	1.42	.028	.018	.463	.034	5.72	1.05	.041	.163	50.69
RPS 73-28	R	20	33.74	.116	6.06	1.32	.019	.020	.440	.033	6.02	1.09	.041	.177	50.42
RPS 73-29	R	21	33.76	.126	6.05	1.40	.026	.022	.461	.014	5.82	1.15	.035	.117	50.58
RPS 73-30	II	1	33.79	.110	6.04	1.44	.000	.020	.470	.040	5.68	1.23	.040	.100	51.31
RPS 73-30	I	20	33.41	.173	6.06	1.72	.025	.055	.590	.058	5.11	1.33	.023	.123	50.98
RPS 73-39		14	33.53	.171	6.08	1.72	.026	.050	.591	.061	5.36	0.90	.022	.124	51.27
RPS 73-41	R	20	33.87	.164	6.24	1.20	.032	.068	.474	.025	5.23	1.48	.042	.145	50.83
RPS 73-46		21	33.92	.137	6.11	1.13	.021	.055	.413	.014	5.16	1.47	.039	.180	51.30
RPS 73-49		17	34.14	.091	6.18	1.01	.024	.034	.372	.004	5.53	1.45	.071	.191	50.81
RPS 73-50	R	19	33.96	.091	6.14	1.02	.021	.036	.372	.000	5.57	1.38	.064	.211	50.26
RPS 73-51		22	33.99	.087	6.14	0.98	.016	.032	.373	.004	5.63	1.39	.072	.194	50.30
RPS 73-52		23	34.09	.084	6.17	0.99	.020	.037	.372	.000	5.55	1.42	.072	.193	50.44
RPS 73-54		4	34.01	.102	6.13	0.95	.025	.027	.370	.000	5.75	1.35	.070	.200	50.29
RPS 73-55		20	33.60	.207	6.24	1.44	.030	.090	.572	.022	4.84	1.47	.020	.123	50.72
rrm09-1485	II	2	34.33	.111	5.98	1.19	.041	.025	.356	.004	4.11	2.03	.048	.166	52.24
rrm09-1485	I	15	34.38	.112	6.01	1.32	.034	.028	.378	.026	4.12	2.16	.051	.188	52.03
thermal96-1(6.0')		20	33.91	.122	6.11	1.50	.027	.022	.459	.028	5.07	1.92	.043	.364	50.75

thermal96-1(6.4')		18	34.07	.121	6.15	1.51	.030	.026	.464	.027	5.27	1.89	.042	.276	49.97
thermal96-1(6.9')		20	33.87	.137	6.15	1.57	.025	.022	.477	.030	5.68	1.66	.039	.242	49.82
thermal96-1(7.4')		20	33.85	.127	6.15	1.57	.024	.026	.485	.036	5.84	1.57	.041	.210	49.47
thermal96-1(7.8')		18	33.81	.120	6.13	1.52	.030	.022	.478	.027	6.23	1.31	.034	.167	48.93
thermal96-1(8.0')	I	19	33.68	.129	6.14	1.52	.019	.023	.494	.025	6.01	1.47	.031	.150	49.19
thermal96-1(8.0')	II	1	33.02	.132	5.98	1.66	.040	.026	.731	.045	5.81	1.40	.044	.186	49.31
usu88-4	I	11	33.42	.254	6.19	1.51	.038	.124	.584	.108	4.37	2.02	.042	.167	50.28
usu88-4	II	3	33.41	.260	6.23	1.58	.029	.124	.659	.123	4.31	2.00	.034	.175	50.23
usu88-4	III	2	34.03	.222	6.02	1.29	.026	.085	.454	.088	4.55	1.91	.042	.167	50.16
usu88-4	IVa	1	34.12	.191	5.96	1.03	.030	.047	.318	.088	4.63	1.92	.028	.173	50.40
usu88-4	IVb	1	34.28	.164	5.97	1.20	.026	.075	.386	.100	4.61	1.83	.053	.187	50.61
usu88-6		19	34.22	.116	6.02	0.83	.029	.047	.314	.095	4.79	1.93	.104	.186	49.88
usu88-8		21	34.15	.116	6.03	0.84	.035	.049	.315	.094	4.60	2.03	.102	.197	50.03
usu88-9	III	4	33.99	.096	6.02	1.04	.006	.039	.364	.011	5.60	1.45	.066	.256	49.64
usu88-9	I	10	33.84	.130	5.94	1.27	.019	.041	.394	.071	5.04	1.72	.029	.188	50.41
usu88-9	II	6	33.47	.214	6.04	1.49	.027	.091	.554	.128	4.75	1.81	.018	.174	50.49
wch09-1483	R1	10	34.00	.129	6.09	1.20	.026	.050	.452	.034	4.81	1.76	.054	.231	51.74
wch09-1483	II	3	33.75	.159	6.15	1.42	.025	.070	.531	.051	4.62	1.84	.051	.200	51.78
wch09-1483	III	1	33.88	.187	6.11	1.70	.014	.072	.570	.103	4.71	1.62	.038	.192	51.84
yos10-1580	II	1	34.06	.091	6.01	1.21	.049	.041	.345	.000	4.72	2.30	.052	.215	51.46
yos10-1580	R1	17	33.95	.109	6.03	1.34	.037	.042	.367	.010	4.77	2.16	.056	.175	51.50
yos10-1581		20	34.05	.136	5.91	1.50	.023	.010	.492	.049	3.80	1.20	.034	.080	51.21
yos10-1582		20	33.56	.095	6.01	1.16	.021	.035	.362	.000	6.21	1.03	.062	.286	50.98
yos10-1598		19	33.83	.100	6.06	0.98	.015	.050	.373	.019	5.43	1.74	.079	.272	50.17
yos10-1604	II	1	33.57	.166	5.83	0.99	.000	.057	.325	.003	4.84	1.66	.051	.000	50.11
yos10-1604	I	15	33.43	.187	5.96	1.22	.013	.081	.430	.005	4.52	2.00	.036	.000	50.00