

# Tephrochronology Results for the Copperton, Lofgreen, and Magna Quadrangles, Utah

*by*

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## **INTRODUCTION**

This open-file report makes available raw analytical data from laboratory procedures completed to determine the tephrochronology of rock samples collected during geologic mapping partially supported by the Utah Geological Survey (UGS). Additional information about these samples is available in Clark and others (2012, 2015) and Kirby (2010). Final published maps of the Rush Valley and Tooele 30' x 60' quadrangles and Lofgreen 7.5' quadrangle are in progress. These data were prepared by the Electron Microprobe Laboratory of the University of Utah, Salt Lake City, under contract to the UGS. These data update some of the data and interpretations presented in the geologic maps of the Copperton and Magna 7.5' quadrangles (Biek and others, 2007; Solomon and others, 2007). These data are highly technical in nature and proper interpretation requires considerable training in applicable geochemical techniques.

## **DISCLAIMER**

This open-file release is intended as a data repository for technical analytical information gathered in support of geologic mapping. These data may not conform to UGS technical or editorial standards. Therefore, it may be premature for an individual or group to take actions based on the contents of this report. The Utah Department of Natural Resources, Utah Geological Survey, makes no warranty, expressed or implied, regarding its suitability 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.

Geologic mapping was funded by the Utah Geological Survey and U.S. Geological Survey, National Cooperative Geologic Mapping Program through USGS STATEMAP award numbers G10AC00386, G13AC00169, and G14AC00214. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the U.S. Government.

## **REFERENCES**

- Biek, R.F., Solomon, B.J., Smith, T.W., and Keith, J.D., 2007, Geologic map of the Copperton quadrangle, Salt Lake County, Utah: Utah Geological Survey Map 219, 2 plates, scale 1:24,000.
- Clark, D.L., Kirby, S.M., and Oviatt, C.G., 2012, Interim geologic map of the Rush Valley 30' x 60' quadrangle, Tooele, Utah, and Salt Lake Counties, Utah: Utah Geological Survey Open-File Report 593, 65 p., 2 plates, scale 1:62,500, CD.

Clark, D.L., Oviatt, C.G., and Dinter, D.A., 2015, Interim geologic map of the east and central parts of the Tooele 30' x 60' quadrangle, Tooele, Salt Lake, and Davis Counties, Utah, year 2: Utah Geological Survey Open-File Report 644, 37 p., 1 plate, scale 1:62,500, CD.

Kirby, S.M., 2010, Interim geologic map of the Lofgreen quadrangle, Tooele County, Utah: Utah Geological Survey Open-File Report 563, 17 p., 2 plates, scale 1:24,000.

Solomon, B.J., Biek, R.F., and Smith, T.W., 2007, Geologic map of the Magna quadrangle, Salt Lake County, Utah: Utah Geological Survey Map 216, 2 plates, scale 1:24,000.

Table 1. Electron microprobe analyses of glass from volcanic ash samples from the Copperton, Lofgreen, and Magna quadrangles, Utah

Sample Number	7.5° Quadrangle	UTM 27-12E	UTM 27-12N	Tephra Name	Age (Ma)	Error (Ma)	Tephra ID	Analysis Date	n	wt%										less		MP					
										SiO <sub>2</sub>	TiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	Fe <sub>2</sub> O <sub>3</sub>	MnO	MgO	CaO	BaO	Na <sub>2</sub> O	K <sub>2</sub> O	F	Cl	Sum	O	sum	H <sub>2</sub> O	Total	
T8	Copperton	405943.8549	4495673.795	Blacktail Creek	6.62	0.03	Nash	2-Sep-14	20	74.20	0.20	11.73	1.32	0.04	0.12	0.49	0.10	3.16	5.43	0.10	96.89	0.02	96.86	4.13	101.00		
										SD	0.32	0.05	0.13	0.12	0.02	0.02	0.04	0.07	0.33	0.31	0.01	0.51	0.00	0.51	0.55	0.81	
T9	Copperton	405387.757	4495678.85	Blacktail Creek	6.62	0.03	Nash	2-Sep-14	20	74.22	0.19	11.73	1.28	0.03	0.11	0.49	0.12	3.24	5.32	0.10	96.84	0.02	96.81	4.00	100.82		
										SD	0.24	0.04	0.11	0.06	0.02	0.01	0.03	0.05	0.20	0.30	0.01	0.38	0.00	0.38	0.52	0.57	
T10	Copperton	408251.9187	4496332.96	Blacktail Creek	6.62	0.03	Nash	2-Sep-14	20	74.31	0.20	11.64	1.26	0.04	0.11	0.51	0.09	3.00	5.59	0.11	96.85	0.03	96.82	3.93	100.76		
										SD	0.32	0.03	0.07	0.06	0.02	0.01	0.04	0.07	0.29	0.32	0.01	0.41	0.00	0.41	0.50	0.61	
T12	Copperton	406867.527	4491155.935	Blacktail Creek	6.62	0.03	Nash	2-Sep-14	20	74.31	0.21	11.53	1.35	0.03	0.10	0.47	0.05	2.91	5.67	0.08	96.70	0.02	96.68	4.11	100.79		
										SD	0.43	0.03	0.12	0.05	0.02	0.01	0.03	0.04	0.19	0.24	0.01	0.53	0.00	0.53	0.76	0.67	
T11	Copperton	409394.0626	4495901.184	Wolverine Creek	5.6?		Nash	2-Sep-14	20	73.93	0.12	11.87	1.36	0.04	0.09	0.51	0.06	3.49	4.94	0.13	96.54	0.03	96.51	4.23	100.74		
										SD	0.42	0.03	0.12	0.05	0.02	0.01	0.02	0.06	0.23	0.19	0.01	0.55	0.00	0.55	0.72	0.53	
T14	Copperton	409058.4211	4496939.551	Walcott	6.62	0.03	Nash	30-Mar-15	21	72.96	0.21	11.50	1.22	0.04	0.13	0.45	0.11	3.21	5.73	0.03	0.10	95.70	0.04	95.66	4.36	100.03	
										SD	0.35	0.02	0.09	0.05	0.03	0.02	0.02	0.03	0.18	0.26	0.03	0.01	1.08	0.02	1.07	0.19	1.26
T15	Magna	408398.4825	4503223.932	unknown			Nash	30-Mar-15	20	72.30	0.20	11.26	1.86	0.04	0.08	0.52	0.07	2.61	6.72	0.02	0.05	95.72	0.02	95.71	4.40	100.11	
										SD	0.51	0.04	0.12	0.07	0.02	0.03	0.03	0.28	0.43	0.03	0.01	0.55	0.01	0.55	0.45	0.74	
T16	Magna	408251.133	4503249.623	unknown			Nash	30-Mar-15	21	72.58	0.20	11.30	1.81	0.03	0.09	0.51	0.06	2.69	6.56	0.03	0.05	95.92	0.02	95.90	4.44	100.34	
										SD	0.36	0.03	0.11	0.12	0.02	0.03	0.04	0.29	0.43	0.03	0.01	0.24	0.01	0.24	0.44	0.58	
412	Lofgreen	388219	4431831	Walcott or BTC	6.33		Perkins	30-Mar-12	19	71.3	.203	11.5	1.25	.032	.087	.452	.066	2.96	5.40	0.126	0.108		0.08		4.90	98.2	
1751	Lofgreen	391989	4431499	Walcott or BTC	6.33		Perkins	30-Mar-12	15	71.4	.195	11.4	1.22	.043	.085	.445	.077	2.99	5.37	0.00	0.11		0.03		4.4	97.7	
396	Lofgreen	386445	4434257	Blacktail Creek or Walcott	6.69		Perkins	30-Mar-12	16	72.3	.167	11.5	1.28	.032	.073	.446	.029	2.92	5.50	0.057	0.127		0.05		4.2	98.6	

Notes:  
Values in weight percent

Analyses by Electron Microprobe Laboratory, University of Utah, Cameca SX50  
Lab Director Barbara P. Nash  
Analyst: W. Mace (2-Sept-14, 30-Mar-15)  
Analytical Condition: Acceleration Voltage: 15 KeV, Beam Current: 25 nA, Spot Size: 10 um

Analyst: M.E. Perkins (30-Mar-12)

n = number of glass shards analyzed  
SD = standard deviation