Appendix S3

This Supplemental Material accompanies
Malone, D.H., Craddock, J.P., and Konstantinou, A., 2022, Timing and structural evolution of the Sevier thrust belt, western Wyoming, in Craddock, J.P., Malone, D.H., Foreman, B.Z., and Konstantinou, A., eds., Tectonic Evolution of the Sevier-Laramide Hinterland, Thrust Belt, and Foreland, and Postorogenic Slab Rollback (180–20 Ma): Geological Society of America Special Paper 555, https://doi.org/10.1130/2022.2555(04).

Table A: Microprobe Analyses of Archean Teton Range and Stump Fm. Detrital Garnets

Sample	*Stump 1*	*Stump 2*	*Stump 3*	*Stump 4*	*Stump 5*	*Stump 6*	*Stump 7*	*Averages*	
SiO2	38.31	38.88	38.83	38.31	38.79	38.31	38.79	38.60286	
TiO2	0.1	0.1	0.11	0.1	0.1	0.1	0.1	0.101429	
Al2O3	22.58	22.5	22.46	22.85	22.55	22.85	22.55	22.62	
Cr2O3	-0.02	0.23	0.02	0.01	0.02	0.01	0.02	0.041429	
FeO	21.73	21.45	21.78	21.62	21.58	21.62	21.58	21.62286	
MnO	0.54	0.58	0.54	0.6	0.55	0.61	0.55	0.567143	
MgO	8.65	8.72	8.73	8.71	8.76	8.71	8.76	8.72	
CaO	7.57	7.43	7.43	7.44	7.55	7.44	7.55	7.487143	
Total	99.4	99.6	99.9	99.6	99.9	99.6	99.9	99.7	Almandine

Sample	*Tetons 1*	*Tetons 2*	*Tetons 3*	*Tetons 4*	*Tetons 5*	*Tetons 6*	*Tetons 7*	*Tetons 8*	*Tetons 9*
SiO2	35.89	35.74	37.07	36.23	35.03	35.95	36.27	36.58	37.32
TiO2	-0.01	0.01	0.01	0.01	-1.01	-0.01	0.01	0.028	0.035
Al2O3	21.07	21.2	21.67	21.31	21.18	20.94	20.96	21.11	21.47
Cr2O3	0.03	-0.04	0.01	0.02	-0.02	0.02	-0.01	-0.02	-0.01
FeO	33.46	33.57	33.28	33.51	33.38	32.83	33.28	33.81	33.28
MnO	6.3	6.31	6.62	6.53	6.31	6.51	6.33	6.28	6.22
MgO	1.22	1.23	1.223	1.227	1.18	1.18	1.215	1.19	1.223
CaO	0.24	0.26	0.23	0.23	0.266	0.217	0.261	0.28	0.279
Total	98.2	98.2	100.1	99	97.3	97.6	98.3	99.2	99.8

Sample	*Tetons 10*	*Tetons 11*	*Tetons 12*	*Tetons 13*	*Tetons 14*	*Tetons 15*	*Tetons 16*	*Tetons 17*	*Averages*
SiO2	37.12	37.56	36.48	36.11	36.67	36.01	39.56	39.33	36.76
TiO2	0.035	0.01	-0.01	0.01	-0.01	-0.01	0.12	0.1	-0.0401176
Al2O3	21.41	21.64	21.17	21.34	21.38	21.27	22.84	22.9	21.4623529
Cr2O3	0.023	0.005	0.012	-0.025	0.021	0.02	-0.02	0.015	0.00182353
FeO	33.49	33.85	33.15	32.77	33.41	33.38	21.62	21.32	31.9641176
MnO	6.35	6.18	6.53	6.54	6.48	6.32	0.54	0.533	5.699
MgO	1.228	1.245	1.18	1.216	1.213	1.208	8.71	8.63	2.08929412
CaO	0.252	0.235	0.292	0.274	0.275	0.224	7.56	7.45	1.10735294
Total	99.9	100.7	98.8	98.2	99.4	98.4	100.9	100.2	99.0705882
									Almandine

Table B- Clast Composition of the Conglomerate at McDougal Gap.

Parent Material	Location 1	Location 2
Miss. Madison carbonates	60%	15%
Penn Wells Fm.	10%	15%
Penn Amsden Fm.	5%	20%
Permian Phosphoria Fm.	5%	0%
Triassic Woodside Fm.	0%	5%
Quartzite clasts	0%	0%
Matrix	20%	45%

Table C-Palynology Results from McDougal Gap Conglomerate

	Conglomerate Samples				Surface Lichen Samples			
	1	2	3	4	1	2	3	4
	Count (%)	Count (%)	Count (%)	Count (%)	Count (%)	Count (%)	Count (%)	Count (%)
CONIFERS								
Abies	21(2)	22(6)	13	14	13	10	14(5)	10(12)
Picea	3(11)	3(31)	7(1)	7(13)	10(1)	8(5)	16 (9)	12(21)
Pinus	35(21)	37(60)	43(7)	45(88)	45(19)	36(95)	46(29)	33(67)
Tsuga mertensia	1	1	1	1	0	0	2	1
Tsuga heterophyll	0	0	0	0	1	1	0	0
Pseudtsuga	4	4	0	0	2	2	5	4
DECIDUOUS TREES								
Quercus	0	0	1	1	0	0	0	0
Betula	0(1)	0(1)	0	0	0	0	1	1
Populus	0	0	1	1	3	2	0	1
Ulmus	0	0	2	2	0	0	0	0
Tilia (?)	2	2	0	0	0	0	0	0
Alnus	0	0	1	1	1	1	2	1
Juglana(?)	0	0	0	0	0	0	1	1
Salix	0	0	1	1	0	0	2	1
SHRUBS & HERBS								
Rhus(?)	1	1	0	0	0	0	0	0
Ephedra	0	0	0	0	0	0	1	1
Cyperaceae	0	0	0	0	1	1	2	1
Gramineae	6	6	5	5	4	3	13	9
Chenopod-Amaranth	4	4	0	0	3	2	5	4
Caryophyllaceae	0	0	1	1	2	2	0	0
Saxifragaceae(?)	3	3	3	3	1	1	3	2
Rosaceae	3	3	1	1	2	2	0	0
Leguminosae	1	1	0	0	0	0	0	0
Plantago	1	1	0	0	1	1	0	0
Shepherdia	0	0	0	0	1	1	0	0
Ambrosia	4	4	2	2	0	0	1	1
Artemisia	5	5	14	15	27	22	17	12
Others	0	0	0	0	7	6	8	6
POLLEN SUM (eroded grains)								
	94(35)	97	96 (8)	100	124(20)	101	139(43)	101
AQUATICS								
Sparganium	0		0		0		1	
Potamogeton	0		0		1		0	
FERNS & ALLIES								
	0		0		0		0	
BROPHYTES								
Alete Spores	1		0		0		0	
FUNGI								
Puccinia teleutosp	1		0		0		3	
Ustilago spores	2		0		0		0	
Epicoccummasses	0		19		0		0	
Conidiospores	0		0		4		inf.	
Other	6		15		16		9	
EXOTIC GRAINS*								
	127		186		13		107	
ALIQUOT SAMPLES (from 10 cc)								
	0.0033	0.33	0.0049	0.49	0.0003	0.03	0.0028	0.028
UNIDENTIFIED								
	13	14	4	4	8	6	26	29

UNKNOWN								
	1	1	0	0	1	1	0	0

*- To each 10 cc sample, 2 X 19,000 1,750 grains of Eucalyptus were added.

TABLE D: Darby thrust timing relations

Location/reference	Stratigraphic/fault relationships	Date limits
N. Wyoming Range (Dorr et al. 1977)	Darby thrust cuts late Cretaceous Frontier Fm.	post- late Cretaceous (Turonian;<82 Ma)
Dixon (1982) cross sections 4-9	Prospect and Darby share the same ramp	post- latest Paleocene (Tiffanian;<56 Ma)
McDougal Gap	a) Darby thrust truncates late Cretaceous Hilliard Fm., overlain by McDougal Gap Conglomerate.	post-late Cretaceous (Santonian;<78my)
	b) LaBarge Member of Wasastch Fm. (early Eocene) over-lies Prospect thrust and is folded in Prospect thrust.	post- early Eocene (Graybullian < 53 my)
Hoback and Green River Basins (Dorr et al. 1977; Wiltschko and Dorr 1983)	Synorogenic early Paleocene Hoback Fm. and middle Paleocene Chappo Fm. shed from Darby thrust sheet.	early-mid Paleocene (Tiffanian 58-60 my)
La Barge area (Dorr and Gingerich, 1980)	Hogsback (Darby) thrust cuts late Cretaceous Adaville Fm, but doesn't offset middle Paleocene Chappo Fm.	post- late Cretaceous-pre-middle Paleocene (Campanian-Tiffanian; <72->58 my)
LaBarge area (Kraig et al. 1987)	Geometric and kinematic constraints concerning the Moxa Arch, Darby-Hogsback and Prospect fault systems.	post-latest Paleocene (Tiffanian; < 56 my)
Solum and Van der Pluijm (2007)	Ar-Ar ages on Darby thrust gouge illite	48.6 Ma