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LETTER REPORT

AN ENERGY-DISPERSIVE X-RAY FLUORESCENCE ANALYSIS OF OBSIDIAN ARTIFACTS FROM THE POWERS RANCH SITE (AZ CC:3:46 ASM), EAST-CENTRAL ARIZONA

19 January 2007

Dr. Patricia Gilman
Department of Anthropology
University of Oklahoma
Norman, OK 73019

Dear Pat,

Not surprisingly, all the artifacts were produced from one of the source groups of Mule Creek or Cow Canyon. As you know, the Cow Canyon and Mule Creek source material is available as secondary deposits in the 111 Ranch Formation and the Gila River Quaternary alluvium in the Safford/San Carlos/San Simon Valleys. However, the Mule Creek-N. Sawmill Creek group has not yet been detected in the alluvium, although it could have been deposited in the past (Shackley 1998, 2005; see also <http://www.swxrflab.net/swobsrscs.htm>). Many of these samples were small, and nearly outside the dimensions required for EDXRF, and so the elemental concentrations of many of the samples are outside the source standard data as reported in Shackley, particularly for Zr (Shackley 1995, 2005; see Davis et al. 1998).

The samples were analyzed with a Spectrace (ThermoNoran) *QuanX* EDXRF spectrometer in the Archaeological XRF Laboratory, University of California, Berkeley. Instrumental methods can be found at <http://www.swxrflab.net/anlysis.htm>. Analysis of the USGS RGM-1 standard indicates high machine precision for the elements of interest (Govnidaraju 1994; Table 1 here).

Sincerely,

M. Steven Shackley, Ph.D.
Director

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Table 1. Elemental concentrations for the archaeological samples. All measurements in parts per million (ppm).

Sample	Ti	Mn	Fe	Rb	Sr	Y	Zr	Nb	Source
60	440	384	7290	215	4	35	99	28	Mule Cr/AC-MM
234	417	551	5849	359	4	74	92	113	Mule Cr/N Sawmill Cr
245	468	384	7687	201	5	40	91	22	Mule Cr/AC-MM
260	668	492	7121	115	106	19	100	13	Cow Cnyn/111 Ranch
274	656	529	6519	150	87	22	80	13	Cow Cnyn/111 Ranch
449	540	358	7323	202	9	37	92	30	Mule Cr/AC-MM
455	591	405	7874	217	3	42	98	20	Mule Cr/AC-MM
511	545	394	7940	229	5	46	93	26	Mule Cr/AC-MM
529	466	405	7858	225	10	48	99	21	Mule Cr/AC-MM
560	609	380	7538	210	3	36	94	17	Mule Cr/AC-MM
588	502	407	7697	209	6	38	99	17	Mule Cr/AC-MM
762	521	423	8255	240	4	52	110	31	Mule Cr/AC-MM
827	627	397	7920	219	8	47	101	20	Mule Cr/AC-MM
319H	575	557	8303	241	8	47	111	24	Mule Cr/AC-MM
349C	570	386	7783	221	6	41	96	31	Mule Cr/AC-MM
400F	656	365	7629	190	12	42	95	17	Mule Cr/AC-MM
495B	636	357	7781	217	3	42	102	26	Mule Cr/AC-MM
585A	500	550	5900	316	0	65	80	99	Mule Cr/N Sawmill Cr
585B	436	381	7361	210	4	46	94	24	Mule Cr/AC-MM
585C	693	528	6402	144	81	22	82	20	Cow Cnyn/111 Ranch
585D	895	442	7405	117	105	19	105	14	Cow Cnyn/111 Ranch
650A	939	492	7423	124	119	19	119	15	Cow Cnyn/111 Ranch
650B	725	506	6515	141	82	23	75	14	Cow Cnyn/111 Ranch
804A	841	665	6653	173	2	29	111	29	Mule Cr/AC-MM
804B	441	360	7198	202	5	41	91	20	Mule Cr/AC-MM

RGM-1	1369	327	13058	148	105	23	214	5	standard
RGM-1	1373	312	13161	156	106	27	218	15	standard
