COSMOGENIC RADIONUCLIDES IN THREE PAIRED HOWARDITES AND A POLYMICT DIOGENITE FROM PECORA ESCARPMENT ICEFIELD, ANTARCTICA. K. C. Welten[1], M. W. Caffee[2], A. W. Beck[3] [1]Space Sciences Laboratory, University of California, Berkeley, CA 94720, USA, (e-mail: kcwelten@berkeley.edu), [2]Department of Physics, Purdue University, West Lafayette, IN 47907, USA, [3]University of Tennessee, Knoxville, TN 37919, USA

Introduction: The Pecora Escarpment (PCA) stranding area in Antarctica has yielded 9 small howardites and 2 diogenites in an area informally known as the Pecora North Forty Icefield. Based on petrographic studies [1,2], it was concluded that at least three of the howardites are paired, even though they show remarkable heterogeneity on a cm-scale. The heterogeneity of howardites at this small scale is relevant to observations of Vesta that will made by the Dawn mission. In this work we measured cosmogenic radionuclides in three howardites, PCA 02009, 02013 and 02015, to verify pairing, and to investigate possible pairing with PCA 02008, a polymict diogenite which contains ~10% of eucritic material, and was derived from an object with a pre-atmospheric radius of 50-60 cm [3]. We also performed a petrographic study of PCA 02008 to investigate its possible relationship to the PCA howardites.

Petrography of PCA 02008. PCA 02008 is a fragmental diogenite breccia dominated by OPX clasts (88 vol%) ranging in size from 70 µm to 2 mm. Small (30-100 µm) eucritic fragments, rich in plagioclase and CPX, occur in veins between larger OPX clasts. Since PCA 02008 contains a larger proportion of CPX (7 vol%) and glass (0.4%) than typical diogenites, a relationship to the PCA howardites cannot be ruled out.

Cosmogenic radionuclides. The ^{10}Be concentrations in these four HED samples are relatively constant at 24.0±0.5 dpm/kg. The ^{36}Cl concentration ranges from 7.6 dpm/kg in PCA 02008 to 17.1 dpm/kg in PCA 02015, but are linearly correlated with the bulk Ca content (Table 1). When normalized to the main target elements, Fe and Ca, the four samples yield a constant ^{36}Cl concentration of 19.9±0.7 dpm/kg[Fe+15Ca], which is consistent with pairing.

Conclusions. Both the petrographic observations and cosmogenic nuclide concentrations in PCA 02008, 02009, 02013 and 02015 are consistent with the hypothesis that these three howardites and one diogenite were all part of a single, meter-sized, polymict HED meteoroid.

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References: [1] Beck A. W. et al. (2007) *Lunar Planet. Sci. Conf.*, XXXVIII, #1123. [2] Beck A. W. et al. (2007) *Meteorit. & Planet. Sci*. 42, A17. [3] Welten K. C. et al. (2007) *Nucl. Instr. Meth.* B259, 653-662.

Table 1. Concentrations of major elements and cosmogenic radionuclides (in dpm/kg) in PCA diogenite and howardites.

PCA	Mg	Al	Ca	Fe	^{10}Be	^{36}Cl
02008	15.4	1.29	1.67	12.8	24.4±0.5	7.6±0.2
02009	13.9	1.64	2.18	15.3	23.4±0.5	9.2±0.3
02013	12.5	2.23	2.81	15.7	24.3±0.5	11.0±0.3
02015	9.7	3.82	4.32	17.9	23.6±0.5	17.1±0.6