MSL LANDING SITE IN EASTERN MERIDIANI PLANUM – ANCIENT CRATERED CRUST, SEDIMENTS, SULFATES, AND HEMATITE: H. E. Newsom, University of New Mexico, Institute of Meteoritics and Dept of Earth and Planetary Sciences, Albuquerque, NM 87131, newsom@unm.edu

A diversity of materials and potential biological environments is desirable in the MSL landing site. The layered deposits containing jarosite and other Ca and Mg sulfates in Meridiani Planum are an intriguing target. Analysis of martian sulfates with the MSL instruments can provide clues about present and past environments on Mars, including the source of sulfate (weathering, volcanic aerosols), fluid compositions during sulfate transport (pH, oxygen fugacity, etc.) and the timing of sulfate deposition and mobility [1,2]. Mg-sulfate polymorphs with different water contents will provide information on recent climate history [3]. The low elevation site provides access to 250 m of layered sedimentary deposits under the hematite bearing layer (**Figs. 1-4**) [6]. The site is centered about -1.8 Lat. and 352.4 Lon. A relatively smooth landing site ellipse on top of a hematite-bearing surface is present north of the layered deposits. This site also provides access to ancient terrain that may have clay minerals and/or evidence of impact generated hydrothermal activity [4,5]. Landing to the south of the layered terrain is also possible. Outcrops of the ancient crust are present to the west, and are associated with 25 km, and earlier 60 km diameter impact craters that could also have hydrothermal minerals due to heat from impact melts. In addition, this area has been eroded relatively recently due to possible fluvial activity in the direction of the arrow on Fig. 1., and associated fluvial deposits may be present within the landing site ellipse to the north [6]. This interesting site probably contains a record of both very early and late aqueous environments formed under a variety of environmental conditions.

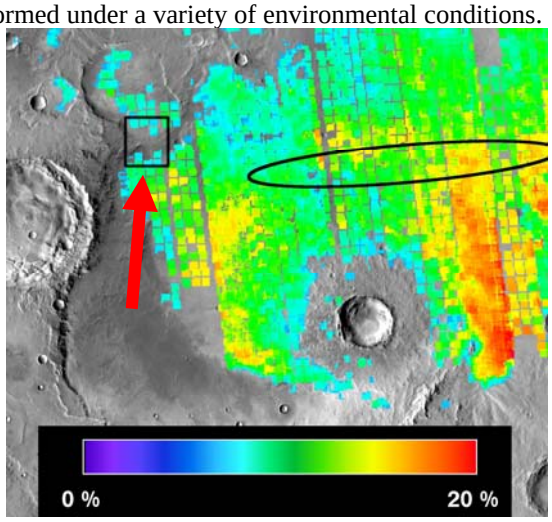

Fig. 1. TES hematite abundance and location of proposed landing site. Box denotes area of Fig. 2.

Refs.: [1] Clark, BC; et al. (2005) *Earth and Planet Sci. Lett*. 240, 73-94 [2] Papike, et al. (2006) *Geochm. Cosmochim. Acta* 70, 1309-1321. [3] Vaniman et al., (2004) *Nature*, 431, 663-665. [4] Poulet, F., et al. (2005) *Nature, 438*, 623-627. [5] Newsom (2006) *Nature* 438, 7068, 570-571. [6] Newsom et al. (2003) *J. Geophys. Res. (Planets)*, ROV 16, 1-12 (DOI 10.1029/2002JE001993).

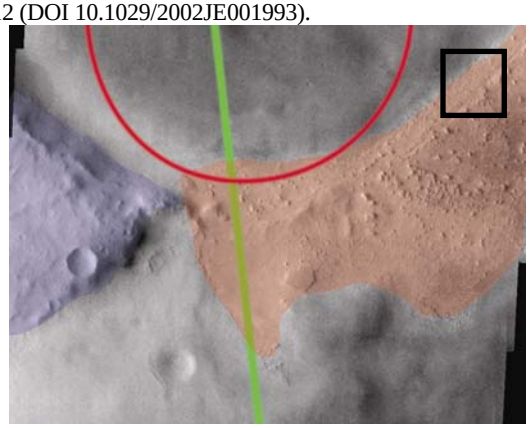

Fig. 2 Landing site area with layered materials in orange, ancient cratered highlands in purple, 10 km landing circle in red, and approximate profile location (Fig. 3) in green. Image ~18 km across. Box denotes approximate area of Fig. 4. THEMIS image V05993001.

Fig. 3. Topographic profile across layering.

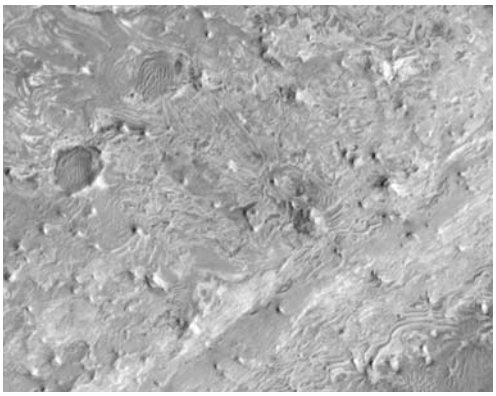

Fig. 4. MOC image e0402489, 3.4 km across showing layered materials filling a 60 km diameter crater under Meridiani Planum.