analyses of crater wall material as well as sedimentary layers within the central mound, possibly of fluvial origin. EL4 Crater may have hosted hydrothermal systems/ponded water for life, particularly given evidence for volatiles. PL1 If it's not geologically active now it's unlikely to be a site for present life.

8. Floor of Valles Marineris: (7.0°S, 72.7W) (WEH wt% = 4.49) Interior layered deposits, stratigraphy and mineralogy; VM wall talus and stratigraphy. Examination of regional connection to circum-Chryse outflow channels. EL3 May have layers of sediments with early biology? PL3 Depth may create pressures suitable for transient liquid water even today?

9. Holden-Eberswalde Craters: (24.0°S, 33.6°W) (WEH wt% = 2.47) Late Noachian-Early Hesperian Valley network deltas and stratigraphy. Well-preserved and accessible sedimentary deposits. Ancient crust preserved along crater walls. EL4 See site 7 – same rationale. PL1.

10. Eastern Olympus Mons: (17.7°N, 128.2°W) (WEH wt% = 4.34) Recent volcanic, tectonic and fluvial activity, perhaps within the last few tens of millions of years. EL3 Not clear what the potential is for fossil life, but fluvial activity and volcanic activity would be promising. PL4 recent tectonic activity may suggest geothermal hot spots for present-day life?

11. Elysium Planitia: (5.0°N, 150°E) (WEH wt% = 3.05) Late Amazonian volcanic lava flows and outflow channels deposits. High biological interest. Testing of pack-ice hypothesis for platy units; could yield recent ice activity in the equatorial region of Mars. EL5 Sustained liquid water and lava, i.e. geochemically active and nutrients. PL2 Not geologically/aqueous today.

12. Western Olympus Mons Scarp: (19.6°N, 139.7°W) (WEH wt% = 5.79) Late Amazonian piedmont glacial deposits, stratigraphy of Olympus Mons lava flows and talus deposits. Access to Olympus Mons aureole deposits. EL4 Glacial deposits may be places for early life – if they had melted and provided liquid water. PL2 Not geologically active today to provide habitats for extant life.

13. Eastern Hellas Basin Massifs: (38.7°S, 97.0°E) (WEH wt% = 4.21) Hellas basin rim mountain rings for Noachian stratigraphy; Late Amazonian ice-rich deposits. Late Amazonian gullies, including the Centauri Montes "active gully" site (See 29), EL3 Ice and noachian terrains may have been good for early life – no obvious sustained habitats though? PL2 Not geologically active today?

14. Nili Fossae: (24.2°N, 79.4°E) (WEH wt% = 3.75) Hesperian ridged plains, OMEGA mineralogical anomalies (clays), possible ancient basin impact melt and olivine deposits. EL5 clays and impact melts suggest weathering/water/geochemical activity. May be good microenvironments for life. PL1 Not geologically active today and not obvious where extant life would be sustained.

15. Lyot Crater central deposits: (50.3°N, 29.1°E) (WEH wt% = 4.62) Largest crater in the northern lowlands, crustal stratigraphy, evidence for penetration of the cryosphere. Potential access to Late Amazonian high-latitude volatile-rich mantling deposits. EL5 Penetration of cryosphere may have provided conduit for liquid water into crater hydrothermal system. Good habitat for life. PL2 Not geologically active now, but the crater is in permafrost and contains ice — may have basal ice habitats for life?

16. Coloe Fossae Dichotomy Boundary: (41.3°N, 54.2°E) (WEH wt% = 3.86) Stratigraphy of dichotomy boundary scarp, Amazonian lobate debris aprons and lineated valley fill. Accessing the plateaus that are interspersed amongst the lineated valley fill can allow for testing as to whether potential glaciation was local or regional. WG EL3 Not a site of ancient water, but there was obviously geological activity, which may benefit life?? PL1 Not geologically active/water rich now?

17. Utopia Planitia: (28.5°N, 134.4°E) (WEH wt% = 5.49) Examine the deposits on the floor of Utopia, including the lahar-like deposits and related materials. Access to volcanic and fluvial deposits; high concentration of polygonally patterned ground in Utopia. EL2 Dead desert in the past? May have been more water rich in the very early history of Mars? PL1 Dead today.

18. Aram Chaos: (2.6°N, 21°W) (WEH wt% = 4.35) Outflow channel processes. Examine the nature of a range of mineralogical anomalies and investigate the OMEGA-based mineralogy sequence, testing the stratigraphic relationships. EL3 Outflow channels may have been good for life, but probably very transient water availabilities? PL1 Not a geologically active site today for life

19. Arsia Mons Glacial/Volcanism: (4.8°S, 126.3°W) (WEH wt% = 5.41) Examine site of late stage volcanism extruded from dikes cutting Late Amazonian glacial deposit on the northwest flank of Arsia Mons. Meteorological analysis of local climate at high elevations. EL2 If the volcanism wasn't in an environment of high water content maybe not interesting? PL1 Not active today?

20. Slope Streaks: (14.4°N, 118.2°W) (WEH wt% = 4.31) Examine the nature and origin of slopes streaks and their characteristics, including searching for subsurface water, springs, landslide deposits, etc. EL4 Possible regions of past water, springs etc. PL4 Possible regions of present-day water, springs etc?

21. Atlantis Chaos: (34.8°S, 177.4°W) (WEH wt% = 4.99) Examine the nature of Atlantis Chaos and assess the large pluvial