LANDING SITE "LINE" COORDINATES FOR MOC TARGETTING

Author	Scientific Goals and/or Comments	Name of region	Coordinates
Anderson and Head	• composition of interior deposits • formation of Valles Marineris • wall rock structure • regolith development • morphology and composition of Valles Marineris • atmosphere at higher pressures • climate history • evidence for water	Candor Chasma	7.7˚S / 72.5˚W
APEX	Rock abundance: 9%, Thermal Inertia: 8.0, Fine Comp TI: 7.8, albedo: 0.221, Elevation: 1668m, unit: HNbr, Views: excellent MOC images: 6103, 6604, 9303, 9304, 10703, 36105 This site provides the opportunity to sample heavily dissected Hesperian/Noachian aged highlands crust, while providing views of nearby Noachian aged massifs. The massifs are interpreted to be eroded remnants of the oldest Martian crust which has been uplifted and tilted during the formation of the Isidis basin. One large massif immediately SW of the ellipse rises approximately 2500 m above the elevation of the center of the error ellipse within a distance of approximately 10 km from the center. The long axis of the ellipse runs nearly parallel to the edge of this massif, thus minimizing the average distance between the ellipse and the massif and providing for excellent views. MOC image 36105 shows clearly an area in Lybia Montes in which there is landable highlands material leading all the way up to the base of a smaller massif. If this image is representative of the sites chosen, it will be possible to place the landing site close enough to a large massif as to obtain spectacular and scientifically useful views of these Noachian massifs. Another massif of the same size lies approximately 20 km ESE of the center of the ellipse. A number of small fluvial valleys within the ellipse drain northward from the SW massif and from the region between the two massifs. This sight has a high rock abundance (within the engineering constraints) and so should provide an adequate amount of rocks for rover analysis. The sites high fine component thermal inertia and somewhat low albedo indicate that it is a relatively dust-poor site. MOC images of similar ancient highlands crust in the Lybia Montes region appear free of obvious hazards to landing.	Lybia Montes 1	1.8 N, 271.4W
APEX	Rock abundance: 4%, Thermal Inertia: 9.8, Fine Comp TI: 9.8, albedo: 0.204, Elevation: ~700 m, unit: HNbr/k, Views: decent MOC images: same as LM 1 This site also provides the opportunity to sample heavily dissected Hesperian/Noachian aged highlands crust, while providing view of nearby Noachian aged massifs. The site lies near a semicircular massif forming a basin. Valleys drain from the walls of the basin northward, coalescing to form one large channel which flows out to the north. This site lies in the SW portion of the basin, adjacent to the 2500+ m massif forming the basin rim. However, surface slopes immediately adjacent to the basin which limit the placement of the landing site, and the gradual slope of the massif itself result in less impressive views than would be expected. South of the rim of this basin, the land continues to rise in elevation. Several small valleys drain northward through and from the ellipse itself. This site has a somewhat low rock abundance, though again it should be noted that the size of the pixels in the rock abundance data set is larger than the length scale of the variation of topography in this area. Also, the high fine component thermal inertia and low albedo indicate that the site has little dust, and so may provide a site without a hazardous over abundance of rocks and yet with relatively little dust.	Lybia Montes 2	1.4 N, 278.3 W
APEX	Rock Abundance: 10.0, Thermal Inertia: 10.0, Fine Comp TI: 5.6, albedo: 0.284, Elevation: 2036 m, unit: layered deposit, Views:	Valles Marineris 1	5.57 S, 70.77 W

	excellent MOC images: 25205 (see also MOC images for VM 2) This site provides the unique opportunity to obtain high resolution Pancam and mini-TES data of the Valles Marineris canyon wall while sitting on top of a plateau of the interior layered deposits. The site lies on a large plateau of layered deposits in East Candor Chasma, just south of a spur of the canyon wall which rises several thousand meters above the level of the center of the ellipse. The long axis of the ellipse runs parallel to the canyon wall spur, thus minimizing the average distance between the ellipse and the canyon wall. The ellipse has been placed as close to the wall as possibly without encountering hazardous slopes (as derived from Viking DTMs). While many layered deposit surfaces appear hazardous in MOC images, the one MOC image of this layered deposit plateau (MOC 25205) appears as though it may in fact be smooth (although only a small portion of the image reaches the upper surface of the plateau, and the surrounding slopes are clearly hazardous). Rock abundances and albedo indicate that the site is rich in rocks and poor in dust. Possible hazards near the canyon wall need to be identified in MOC images in order to best judge how close the ellipse can be placed to the wall.		
APEX	Rock Abundance: 11%, Thermal Inertia: 8.3, Fine Comp TI: 7.5, albedo: 0.191, Elevation: 1900 m, unit: layered deposit, Views: excellent MOC images: 4204, 6305, 8104, 8404, 8405, 8507, 25205, 23304 This site lies in southern Melas Chasma on top of layered deposits with a good view of a plateau of layered deposits to the north. This plateau forms an arc just beyond the edge of the ellipse to the north and east at an elevation over 1000m above that of the center of the ellipse. This plateau rises up quite steeply from the level of the surrounding deposit on which the ellipse is situated, allowing for placement of the ellipse in close proximity to the face of the plateau without encountering significant surface slopes. To the southwest of the ellipse, the deposits show a distinct mottled pattern in Viking images, and judging from other Viking images coupled with MOC images, it can be inferred that this mottling exists at a finer scale within the ellipse itself. Areas of mottled layered deposits exhibit variable topography in MOC images, with alternating regions of dunes, rough areas, and level areas. Although the site has a low albedo, the fine component thermal inertia indicates that it is not overly dusty.	Valles Marineris 2	11.59S,73.63 W
Barlow, N.		Site 1	9.12S, 343.8W - 349.0W
Barlow, N.		Site 2	2.80S, 37.0W - 43.0W
Barlow, N.		Site 3	2.50N, 240.0W - 243.0W
Barlow, N.		Site 4	5.00S, 20.0W - 24.0W
Cabrol and Grin		East Terra Meridiani	4S to 7S and 348W to 350W
Chapman, M.		Mangala Valles	6.3 S., 153.1W to 153.3W
Cooper and Head	• formation of hematite • mineralogy of hydrothermal deposits • analysis of Noachian-aged materials • characterization of low albedo materials • oxidation state of rocks • geomorphology • martian life	Sinus Meridiani	1.2˚S / 5.5˚W 2.8˚S / 5.8˚W
Dahl and	• analysis of some of very old exposed rocks	Terra Tyrrhena	2-3˚S / 267-

Head	• Isidis ejecta • composition of upper mantle and lower crust • early hydrologic history • evidence for fluvial erosion or ground water sapping • ground truth for remote sensing for this and previous missions		269˚W
DeHon, R.			4N-1S; 240-245W
Farmer et al.	Highest Priority, High to moderately-high priority sites for Astrobiology. Sites identified meet all engineering constraints (within 3°N-12°S; rock abundance 5-10%) and Viking Orbiter Imagery at <50 m/pixel.	Terra Cimmeria	8-11°S, 216-220°W
Farmer et al.	Highest Priority, High to moderately-high priority sites for Astrobiology. Sites identified meet all engineering constraints (within 3°N-12°S; rock abundance 5-10%) and Viking Orbiter Imagery at <50 m/pixel.	Mangala Valles	3-12°S 150-155°W
Farmer et al.	Moderate to high Priority, High to moderately-high priority sites for Astrobiology. Sites identified meet all engineering constraints (within 3°N-12°S; rock abundance 5-10%) and Viking Orbiter Imagery at <50 m/pixel.	S. Ares Vallis	0-3°N 17-19°W
Farmer et al.	Moderate to high Priority, High to moderately-high priority sites for Astrobiology. Sites identified meet all engineering constraints (within 3°N-12°S; rock abundance 5-10%) and Viking Orbiter Imagery at <50 m/pixel.	Libya Montes	1-3°N 272-274°W
Farmer et al.	Moderate to high Priority, High to moderately-high priority sites for Astrobiology. Sites identified meet all engineering constraints (within 3°N-12°S; rock abundance 5-10%) and Viking Orbiter Imagery at <50 m/pixel.	SE Xanthe/Iani Chaos	9-12°S 27-29°W
Farmer et al.	Moderate to high Priority, High to moderately-high priority sites for Astrobiology. Sites identified meet all engineering constraints (within 3°N-12°S; rock abundance 5-10%) and Viking Orbiter Imagery at <50 m/pixel.	SE Xanthe/Iani Chaos	9-12°S 29-30°W
Farmer et al.	Moderate to high Priority, High to moderately-high priority sites for Astrobiology. Sites identified meet all engineering constraints (within 3°N-12°S; rock abundance 5-10%) and Viking Orbiter Imagery at <50 m/pixel.	SE Xanthe/Iani Chaos	8-12°S 30-31°W
Farmer et al.	Moderate to high Priority, High to moderately-high priority sites for Astrobiology. Sites identified meet all engineering constraints (within 3°N-12°S; rock abundance 5-10%) and Viking Orbiter Imagery at <50 m/pixel.	Iani Chaos	0-3°N 13-15°W
Farmer et al.	Moderate to high Priority, High to moderately-high priority sites for Astrobiology. Sites identified meet all engineering constraints (within 3°N-12°S; rock abundance 5-10%) and Viking Orbiter Imagery at <50 m/pixel.	NE of Gusev crater	14-9°S 180 - 181°W
Farmer et al.	Moderate to high Priority, High to moderately-high priority sites for Astrobiology. Sites identified meet all engineering constraints (within 3°N-12°S; rock abundance 5-10%) and Viking Orbiter Imagery at <50 m/pixel.	Al-Qahira Vallis	15-14°S, 194-196°W
Farmer et al.	Highest Priority sites, High to Moderately-High priority sites nearly meeting present engineering constraints (within 3°N - 12°S), marginal rock abundance, and Viking Orbiter Imagery ~50 to 100 m/pixel.	Libya Montes region	1-3°N, 270-280°W
Farmer et al.	Highest Priority sites, High to Moderately-High priority sites nearly meeting present engineering constraints (within 3°N - 12°S), marginal rock abundance, and Viking Orbiter Imagery ~50 to 100 m/pixel.	Nicholson crater	0°, 163.5-164.5°W
Fishbaugh and Head	• evidence for polar wandering • characteristics of ancient highlands • stratigraphy of crater walls and valleys • origin of valley networks • evidence for possible lacustrine sediments • shoreline sediments of Noachian ocean	Southern Terra Meridiani	4.75˚S /4.75˚W

	• martian life		
Grant, J.		Margaritifer Sinus Basin	10.85S,21.61-21.63 W
Greeley & Kuzmin	Highest Priority sites, High to Moderately-High priority sites nearly meeting present engineering constraints (within 3°N - 12°S), marginal rock abundance, and Viking Orbiter Imagery ~50 to 100 m/pixel.	N Memnonia Terra (1)	11.3°S, 173.7-174.7°W
Greeley & Kuzmin	Highest Priority sites, High to Moderately-High priority sites nearly meeting present engineering constraints (within 3°N - 12°S), marginal rock abundance, and Viking Orbiter Imagery ~50 to 100 m/pixel.	Shalbatana source (1)	0.2°N,45.8-46.8°W
Greeley & Kuzmin	Highest Priority sites, High to Moderately-High priority sites nearly meeting present engineering constraints (within 3°N - 12°S), marginal rock abundance, and Viking Orbiter Imagery ~50 to 100 m/pixel.	Shalbatana source (2)	0.7°N, 44-45°W
Gulick, V.	· Stratigraphy and composition of isolated mesas, highlands materials on the south valley wall, and Apollinaris Patera materials on the north valley wall. · Nature of the valley floor deposits (fluvial or flood plain deposits?, paleolacustrine or marine deposits, volcanic and/or hydrothermal deposits? Other? · Sample possible highland, paleolacustrine, marine, hydrothermal minerals or their alteration products deposited at landing site. Sources of material from highland fluvial valleys from the south and fluvial valleys from the west and north depositing materials from Apollinaris in the landing site region. · Excellent views of nearby highland stratigraphy in south valley wall and possibly in isolated mesas. Excellent view on north wall of Apollinaris matierials. Excellent locale for paleo seeps and springs along northern and southern valley wall.	Southern Apollinaris Patera region 12S, 185.8W	Approx. 12S, 185-186.2W –line coordinate. Approx. 11.9S –12.2S, 185W-186.2W—box coordinates
Gulick, V.	· Nature and composition of the chaos region · Isolated mesas may reveal subsurface lowland startigraphy or be isolated remenats of highland material. · Sample possible paleolake, hydrothermal, marine, volcanic, and fluvial or flood plain deposits. · Sample crater ejecta	Western Apollinaris Patera region Approx. 8.1S, 188.8W Or approx. 8.3S, 181.1W Or anywhere west of the volcano in the "chaos" region that is smooth enough and safe.	8.15S, 188.4W-189.5W—line coordinates or 8.3S, 187.9W-188.2W
Jager and Head	• Amazonian valley floor deposits • stratigraphy of wall rocks • general mineralogy • nature of landslides • water • search for martian life • nature and rheology of volcanic eruptions • high pressure meteorology	Valles Marineris	10˚S / 73˚W
Kuzmin and Greeley	Highest Priority sites, High to Moderately-High priority sites nearly meeting present engineering constraints (within 3°N - 12°S), marginal rock abundance, and Viking Orbiter Imagery ~50 to 100 m/pixel.	Amenthes Rupes	2.9°S, 249-250°W
Kuzmin and Greeley	Highest Priority sites, High to Moderately-High priority sites nearly meeting present engineering constraints (within 3°N - 12°S), marginal rock abundance, and Viking Orbiter Imagery ~50 to 100 m/pixel.	Ganges Chasma (1)	8.5°S, 43.5-44.5°W
Kuzmin and Greeley	Highest Priority sites, High to Moderately-High priority sites nearly meeting present engineering constraints (within 3°N - 12°S), marginal rock abundance, and Viking Orbiter Imagery ~50 to 100 m/pixel.	Ganges Chasma (2)	8.8°S, 42-43°W
Lucchitta, B.		West of Candor Mensa	5.5S 74.4 to 5.5S 74.9

Lucchitta, B.		Candor Chasma	5.5S, 74.6W
Nelson et al.	Moderate to high Priority, High to moderately-high priority sites for Astrobiology. Sites identified meet all engineering constraints (within 3°N-12°S; rock abundance 5-10%) and Viking Orbiter Imagery at <50 m/pixel.	Xanthe/Da Vinci crater	0-3°N 40-44°W
Nelson et al.	Moderate to high Priority, High to moderately-high priority sites for Astrobiology. Sites identified meet all engineering constraints (within 3°N-12°S; rock abundance 5-10%) and Viking Orbiter Imagery at <50 m/pixel.	Apollinaris Chaos	12-4°S 188-190°W
Nelson et al.	Highest Priority sites, High to Moderately-High priority sites nearly meeting present engineering constraints (within 3°N - 12°S), marginal rock abundance, and Viking Orbiter Imagery ~50 to 100 m/pixel.	Apollinaris "chaos"	11.1°S, 188-190°W
Nelson et al.	Highest Priority sites, High to Moderately-High priority sites nearly meeting present engineering constraints (within 3°N - 12°S), marginal rock abundance, and Viking Orbiter Imagery ~50 to 100 m/pixel.	Da Vinci crater	1.2°N, 38.5-39.5°W
Nelson et al.	Highest Priority sites, High to Moderately-High priority sites nearly meeting present engineering constraints (within 3°N - 12°S), marginal rock abundance, and Viking Orbiter Imagery ~50 to 100 m/pixel.	N Memnonia Terra (2)	11.2°S, 177.7-178.7°W
Nelson et al.	Highest Priority sites, High to Moderately-High priority sites nearly meeting present engineering constraints (within 3°N - 12°S), marginal rock abundance, and Viking Orbiter Imagery ~50 to 100 m/pixel.	Reuyl crater	9.9°S, 192.3-193.3°W
Noble and Head	• cratering processes • possible lacustrine deposits • high and low albedo materials • stratigraphy of crater walls • aeolian processes • possible ignimbrite sheets • crystalline hematite • possible felsic magmatism	Central Meridiani Sinus	5˚S / 358˚W
Spaun and Head	• origin of dark valley floor soils • global dust distribution • Noachian basement wall rock stratigraphy • spurr and gully morphology of canyon walls • chronology of geologic units • tectonics of valles Marineris • water (lacustrine deposits, ground water, ground ice) • search for martian life	Valles Marineris	4.2˚S / 70.8˚W
Stewart and Head	• duricrust on crater floor • stratigraphy of crust • evaporites • hydrogeological processes • evidence for martian crater lakes • sediment composition • search for martian life • climatological history • possible volcanic deposits	Madler crater	11˚S / 357˚W