GEOLOGIC MAPPING OF V-19. P. Martin[1], E.R. Stofan[2, 3] and J.E. Guest[3], [1]Durham University, Dept. of Earth Sciences, Science Laboratories, South Road, Durham, DH1 3LE, UK, (paula.martin@durham.ac.uk), [2]Proxemy Research, 20528 Farcroft Lane, Laytonsville, MD 20882 USA (ellen@proxemy.com), [3]Department of Earth Sciences, University College London, Gower Street, London, WC1E 6BT, UK.

Introduction: A geologic map of the Sedna Planitia (V-19) quadrangle is being completed at 1:5,000,000 scale as part of the NASA Planetary Geologic Mapping Program, and will be submitted for review by September 2010.

Overview: The Sedna Planitia quadrangle (V-19) extends from 25°N - 50°N latitude, 330° - 0° longitude. The quadrangle contains the northernmost portion of western Eistla Regio and the Sedna Planitia lowlands. Sedna Planitia consists of low-lying plains units, with numerous small volcanic edifices including shields, domes and cones. The quadrangle also contains several tholi, the large flow-field Neago Fluctūs, the Manzan-Gurme Tesserae, and Zorile Dorsa and Karra-māhte Fossae which run NW-SE through the southwestern part of the quadrangle. There are six coronae in the quadrangle (Table 1), the largest of which is Nissaba (300 km x 220 km), and there are fourteen impact craters (Table 2).

Table 1. Coronae of V-19.

Name	Lat.	Long.	Max Width	Type
Ba'het	48.4	0.1	300 x 145	Concentric
Tutelina	29.0	348.0	180	Concentric
Purandhi	26.1	343.5	170	Concentric
Mesca	27.0	342.6	190	Type II
Nissaba	25.5	355.5	300 x 220	Concentric
Idem-Kuva	25.0	358.0	280	Concentric

Table 2. Impact Craters of V-19.

Name	Lat.	Long.	Diameter (km)
Ariadne	43.9	0.0	20.8
Veta	42.6	349.5	6.4
Jeanne	40.1	331.5	19.5
Unnamed	37.6	350.1	2.1
Zuhrah	34.7	357.0	6.6
Vassi	34.4	346.5	8.8
Al-Taymuriyya	32.9	336.2	21
Nutsa	27.5	341.8	4.2
Barton	27.4	337.5	50
Lachappelle	26.7	336.7	35.3
Roxanna	26.5	334.6	9.2
Kumba	26.3	332.7	11.4
Bakisat	26.0	356.8	7.4
Lilian	25.6	336.0	13.5

Six types of materials have been mapped in the V-19 quadrangle: tessera, plains, volcanic edifice and flow, corona, crater, and surficial materials. All types of material units occur throughout the quadrangle, with the exception of tessera materials, which crop out only in the eastern part of the mapped region.

Highly deformed materials that have been mapped as tessera (unit t) range in size from < 50 km to several hundreds of kilometers across, and include the Manzan-Gurme Tesserae which are made up of several indi-

vidual outcrops distributed along the eastern edge of this quadrangle.

Seven plains materials units have been mapped in V-19 (from oldest to youngest): Sedna deformed plains material (unit pdS), Sedna patchy plains material (unit ppS), Sedna composite-flow plains material (unit pcS), Sedna homogeneous plains material (unit phS), Sedna uniform plains material (unit puS), Sedna mottled plains material (unit pmS) and Sedna lobate plains material (unit plS). These seven units range from relatively localized, limited extent units (e.g. unit pdS) to more regional plains units (e.g. unit phS). Each of the mapped plains units are composed of groups of many smaller plains units of varying age. These smaller plains units have been grouped into a mappable unit because of their similarity in appearance and stratigraphic position relative to other plains units. The regional-scale plains unit (unit phS) dominates the northeastern half of the map. The dominance of this regional-scale plains unit is similar to other mapped quadrangles on Venus [1, 2]. The remaining plains units, units pcS, pdS, ppS, puS, pmS and plS, tend to crop out as isolated patches of materials.

The V-19 quadrangle contains a variety of mappable volcanic landforms including two shield volcanoes (Evaki Tholus and Toci Tholus) and the southern portion of a large flow field (Neago Fluctūs). A total of sixteen units associated with volcanoes have been mapped in this quadrangle, with multiple units mapped at Sif Mons, Sachs Patera and Neago Fluctūs. An oddly textured, radar-bright flow is also mapped in the Sedna plains, which appears to have originated from a several hundred kilometer long fissure. The six coronae within V-19 have a total of eighteen associated flow units. Several edifice fields are also mapped, in which the small volcanic edifices both predate and postdate the other units. Impact crater materials are also mapped.

The geologic history of the V-19 quadrangle is dominated by multiple episodes of plains formation and wrinkle ridge formation interspersed in time and space with edifice- and corona-related volcanism. The formation of Eistla Regio to the southwest of this quadrangle postdates most of the mapped plains units, causing them to be deformed by wrinkle ridges and overlaid by corona and volcano flow units.

Conclusions: V-19 is comparable with our previously mapped quadrangles, V-39, V-46, V-28 and V-53 [3, 4, 5 and 6]. V-19, V-39 and V-46 have a similar number of mapped plains units, whereas V-28 and V-53 have a greater number. V-19, V-28 and V-53 are similar to one another in that all three quadrangles have very horizontal stratigraphic columns, as limited contact between units prevents clear age determinations. This does not mean that all units within each quadrangle formed at the same time. Rather, the stratigraphic columns reflect the limited nature of our stratigraphic knowledge in these quadrangles, allowing for numerous possible geologic histories. This uncertainty is illustrated by the use of hachured columns for each unit. Resurfacing in these quadrangles is on the scale of 100s of square kilometers, consistent with the fact that they lie in the most volcanic region of Venus.

References: [1] Bender, K. C. et al., 2000, Geologic map of the Carson Quadrangle (V-43), Venus. [2] McGill, G. E., 2000, Geologic map of the Sappho Patera Quadrangle (V-20), Venus. [3] Brian, A. W. et al., 2005, Geologic Map of the Taussig Quadrangle (V–39), Venus. [4] Stofan, E. R. and Guest, J. E., 2003, Geologic Map of the Aino Planitia Quadrangle (V–46), Venus. [5] Stofan, E. R. et al., 2009, Geologic Map of the Hecate Chasma Quadrangle (V–28), Venus. [6] Stofan, E. R. and Brian, A. W., 2009, Geologic Map of the Themis Regio Quadrangle (V–53), Venus.