4.2 PROSPECTS

Selection of the following fourteen sub-sections is due to the areas containing significant geophysical characteristics that could contribute to the structural and mineralogical understanding of the area (Figure 4.6). The areas are not described in any particular order of preference or significance.

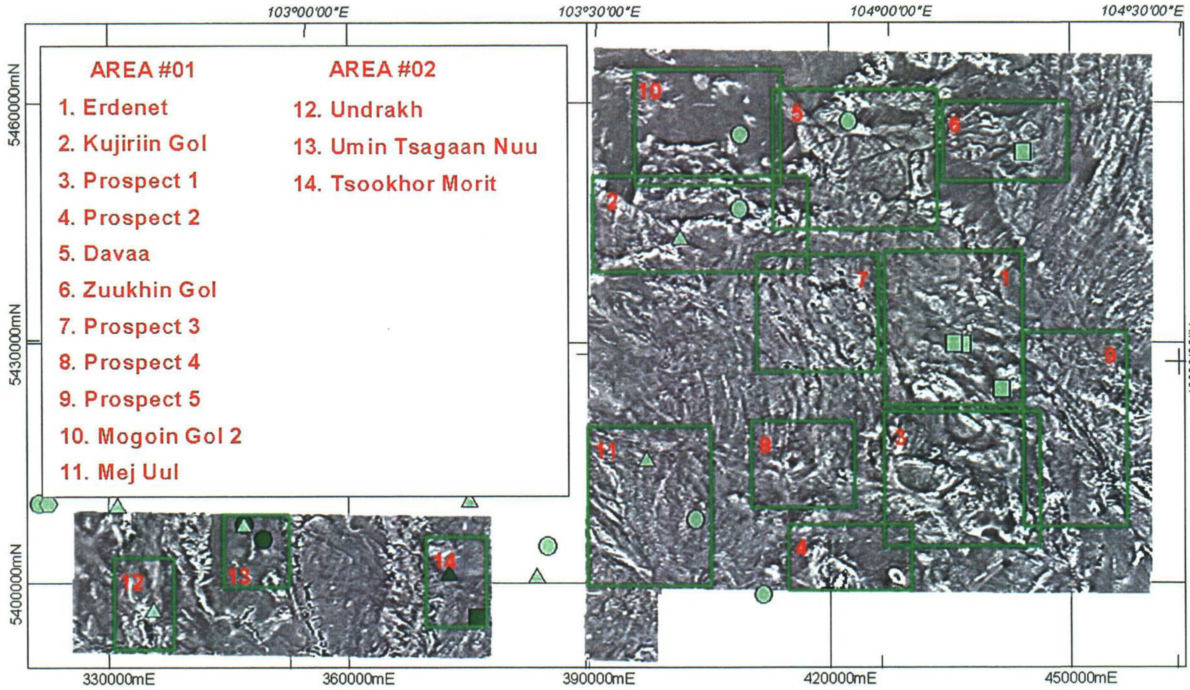

Figure 4.6: Areas that are considered to contain either structures or intrusive units that could be prospective, particularly for porphyry mineralisation.

The format for this section will focus on the structural component of the area and discuss the possibility of igneous relationships. The data shown will be:

- A – TMI-RTP-1VD-greyscale
- B - Published geology at a scale of 1:100,000 or 1:50,000
- C – TMI –RTP-NW sun-illumination
- D – Ternary radiometrics
- E – Digital Elevation Model, plus clipped K radiometric values to the top 10 and 5 % (orange and red repectively.
- F – Landsat 4 TM

It should be noted that due to the limited information relating to the structural geology of the region let alone this project area, it is not possible to generate a single definitive interpretation. Close correlation with published data and geological verification is necessary to refine this work.

4.2.1 Erdenetiin Ovoo

The main geophysical characteristics of the Erdenetiin Ovoo porphyry Cu-Mo deposits are shown in Figure 4.9, a schematic representation of the geological evolution of the area is shown in Figure 4.8. Previous work has highlighted the complex structure (Figure 4.7).

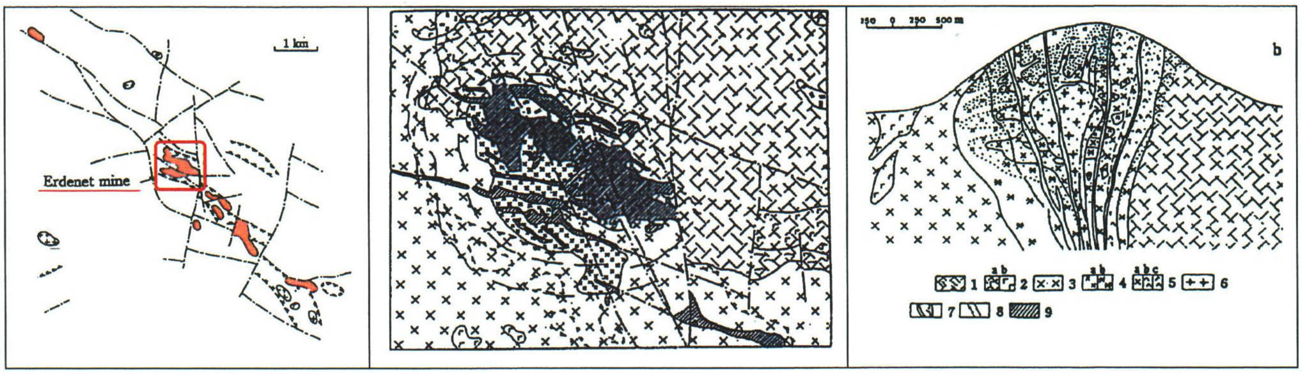

Figure 4.7: Detail around the Erdenetiin Ovoo deposit, (from Dejidmaa and Naito, 1998).

From this study, it is possible to identify a distinctive relative low magnetic intensity response associated with areas of known mineralisation. This low magnetic zone appears to have the geometry of a tight fold closure with an apparent NW axial trace. Similar apparent 'fold' closures are observed along strike of the possible fold axial trace, as shown by zoning within horizons with varying magnetic intensity.

To the N and S of the main mineralised area are large zoned granitic bodies (possibly of the Selenge Complex). Both of these 'Selenge' granites have an approximate NW strike as shown by their elongate elliptical axes. These granitic bodies are separated from the mineralised zone by major NW trending shear zones.

Throughout the area are a series of minor approximately N - S and NE - SW trending faults. These structures are almost perpendicular to the major shears with variations in strike associated with the curvilinear character of the shear zones as they wrap around the 'Selenge' granites.

A significant ENE trending linear feature appears to pass through the centre of the area as shown on the elevation model and Landsat data, but appears to have only a minor affect on the magnetic data. Consequently, we assign this structure to be a minor "late" feature.

The radiometric data shows a strong K response around the Erdenetiin Ovoo mine site. This is likely to be due to the major exposure of bare outcrop and fresh material exposed around the mine shown on the Landsat data. This high response should not be taken as being indicative of a radiometric mineralisation signature in the study area. The tailings dam as expected returns a very low response. The radiometric data shows good correlation and distinction of surface geological units, geomorphic features and published mapping.

Possible Explanations

- A - Published mapping and the known porphyry mineralisation precludes the possibility that mineralisation is hosted within a meta-sedimentary fold structure.
- B - The major shear zones appear to run along the edge of the magnetic low intensity zone. Magnetite destruction by hydrothermal fluids along these shears may create the low magnetite response. The apparent fold closure could be created by accumulation of fluids where the shears intersect or anastomose. However, precise positioning of the major faults and the actual number of faults within this zone is difficult to accurately define, as there is an apparent buffer zone of moderate to high magnetic signature between the low mineralised zone and the 'Selenge" granites.
- C –The relative low magnetic zone and the apparent tight fold closure could actually be the preserved section of part of a larger zoned intrusive body. The moderate to high magnetic material either side of the magnetic low mineralised zone and between the main "Selenge" granites being part of the same zoning. This zoned intrusive body is then attenuated and compressed between the two "Selenge" granites. This deformation has subsequently obscured much of the geometry of the original zoned intrusive body. A schematic of this model is shown in Figure 4.8.

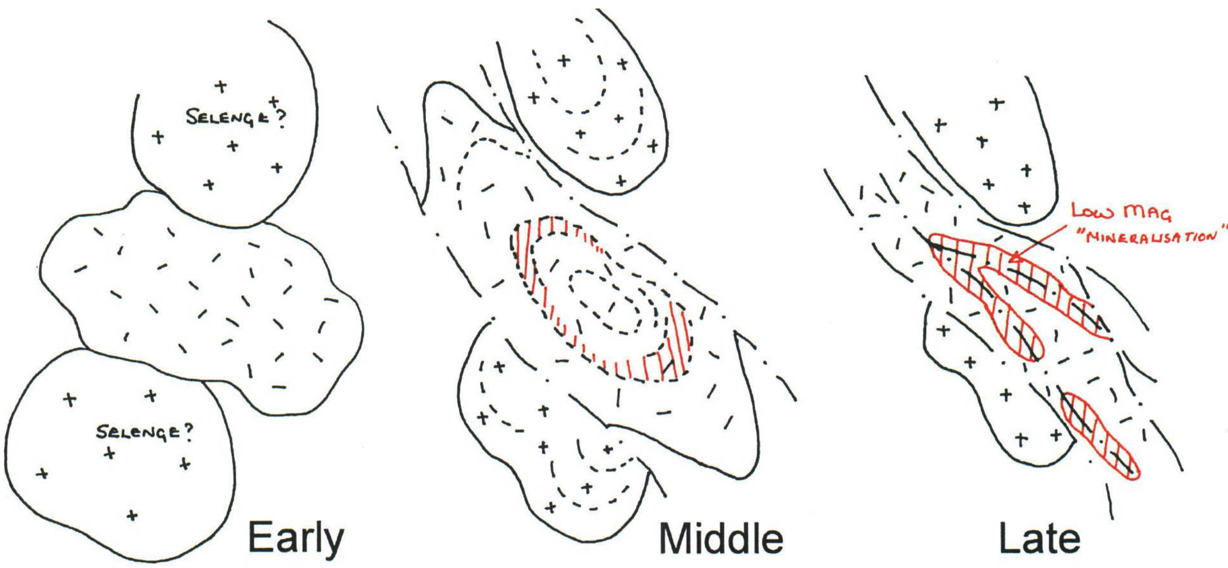

Figure 4.8: Schematic diagram for the possible evolution of the present low magnetic intensity zone associated with the Erdenetiin Ovoo porphyry deposit. Note the model requires zonation of the granitic bodies and compression between NW trending shear zones.

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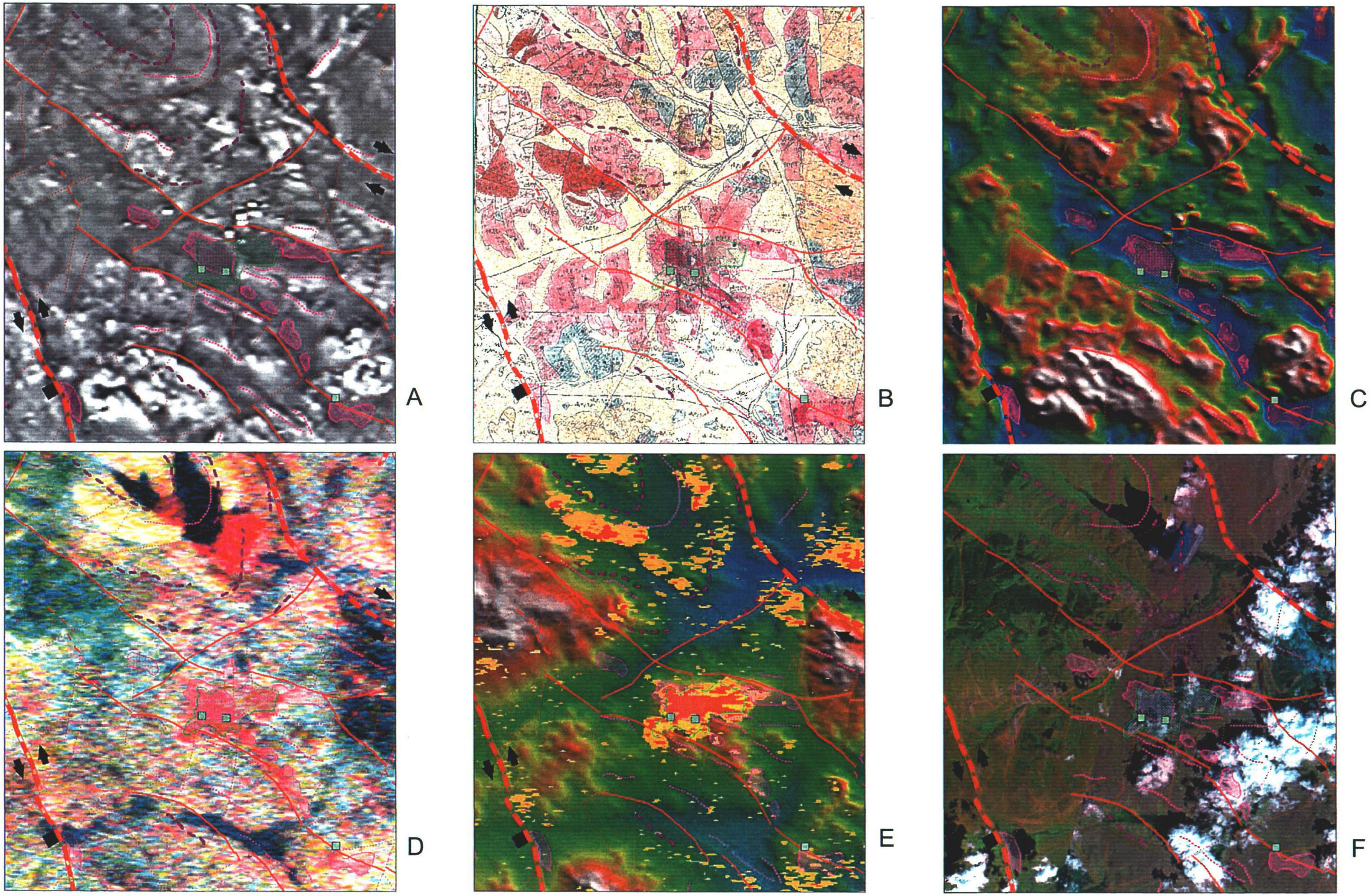

Figure 4.9: Characteristics of the Erdenet prospect area.

4.2.2 Kujirin Gol

A schematic summary of the geology for the prospect area is shown in Figure 4.10, while examples of data are shown in Figure 4.11. This area contains a complex interaction of structures and igneous zonation depicted by magnetic signatures from varying stratigraphic levels. The dominant feature within this area is the distinctive sub-linear ENE - WSW trending unit with a relative high magnetic intensity and high amplitude response. The interpretation for this unit is that it represents a relatively shallow unit that was probably thrust into its current position. This structural zone is closely associated with two major NW trending faults. To the east of the area the NW trending fault appears to truncate and offset the unit, while in the central area, the NW structure appears to create a jog. This difference may relate to the depth of the structure, with the eastern most fault occurring close to surface, while the central NW trending fault, is deeper, and possibly acts as a basement ramp relative to the near surface thrust.

To the N of this possible thrust front the relative magnetic intensity alternates in a series of sub-parallel units. This could be due to:

- A – compression and juxtaposition of sub-parallel units with differing magnetic character
- B – alteration and magnetite destruction associated with fluid movement along the thrust front
- C – Development of thrust stacks and associated basins to create relative difference of topographic height and thickness of cover. The apparent continuation of NW trends in the centre of the area having high response in the N and tapering off to a low response in the S suggest this could be the case (401500mE 5446000mN).

The relative ages of these major structures suggests that the NW to WNW trending faults initiated at an earlier stage than the E-W trending structures. These NW to WNW trending structures may also link up to the faults/ shears related to the Erdenetiin Ovoo Porphry deposit in section 4.2.1.

An additional or alternate explanation for the geophysical response in this area is that much of the response is due to a series of zoned igneous intrusions. The high magnetic response may represent an early intrusive phase subsequently intruded or altered by later magmatic activity. In the west of the area, a progressive decrease in the relative magnetic response may suggest preferential fluid flow and de-magnetisation occurred along the contacts of intrusive units.

It is also possible to interpret several sub-circular to elliptical features, with varying scales. The main apparent strike is approximately E - W, characterising these units to Domain 2A (section 4.1).

There is good correlation between the radiometric response and the structural, geomorphic and published data. In the W of the prospect area a zone of high K response occurs along the zone of low magnetic response, to the north of the thrust front. This may be related to potassic alteration. However, the high K response to the S of the thrust front in the E appears to coincide with colluvial deposits and is probably accumulation of weathering surficial material.

Known mineralisation appears to be closely related to the NW tending structures. However it is uncertain whether this is structurally controlled or related to the igneous zonation, or whether it is the combination of both.

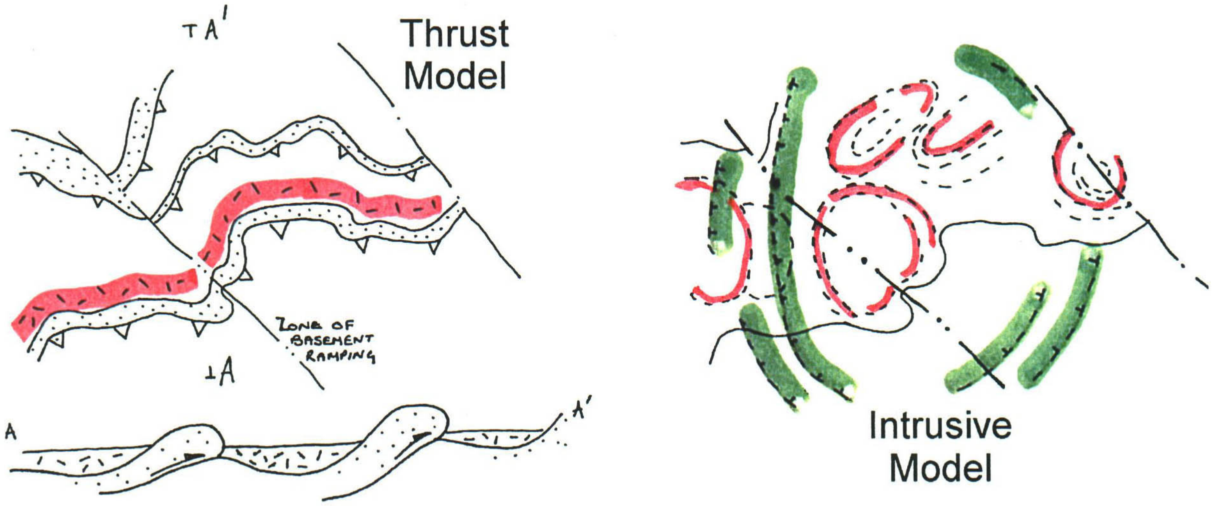

Figure 4.10: Schematic end-member models for the possible interpretation for the Kujirin Gol prospect. In reality the true model is likely to represent a combination of both.

Recognition of large circular bodies although a strong possibility to be genuine, should be treated with some caution. As the area is subject to extensive faulting, much of which is either anastomosing or perpendicular, it is important to consider the effects of weathering and erosion on the resulting magnetic signature. Consideration of the orientation and thickness of magnetic units and topographic effects should be made. A good understanding of the local geology and geomorphology is therefore required.

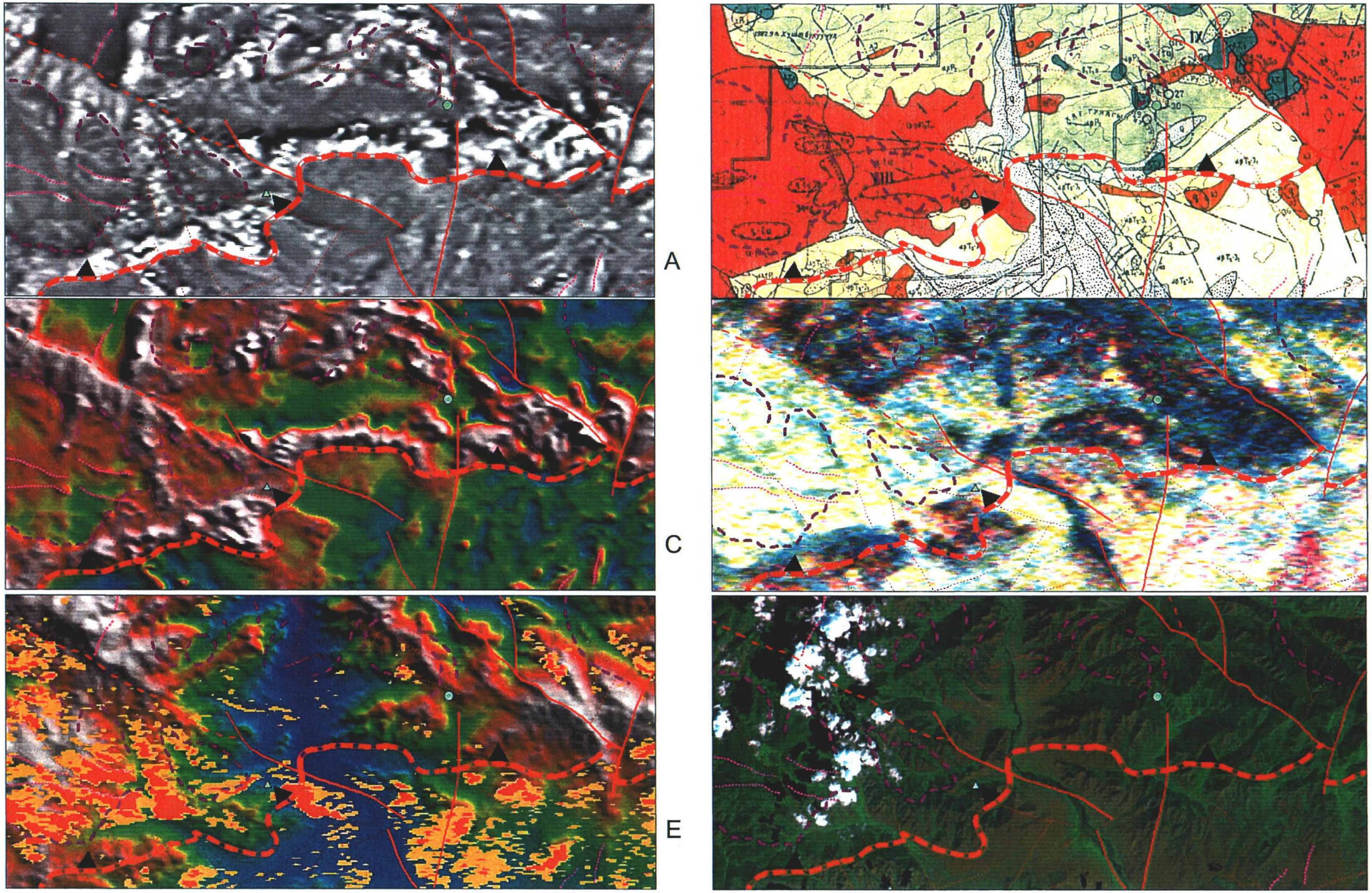

Figure 4.11: Characteristics of the Kujirin Gol prospect area.

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4.2.3 Prospect 1

A schematic summary of the geology for the prospect area is shown in Figure 4.12, while examples of data are shown in Figure 4.13. The dominant structures in this prospect area are the two WNW trend faults or shear zones. These faults separate three zones containing granites with differing magnetic and radiometric character. An apparently relatively minor NE trending fault also separates two granites that differ in their magnetic response along strike within the central zone. The slight elongate ellipsoidal character of all of the granitic bodies in this area may suggest that the structures in this zone are fairly late and that only minor compression and displacement has occurred in this area.

This area could be analogous to a less deformed intrusive geometry to the Erdenetiin Ovoo prospect area (section 4.2.1).

The magnetic data clearly defines zonation within the granitic bodies, this is either due directly to successive intrusive phases with different magnetic character or alteration. The low magnetic zones within the intrusive bodies are primary targets. The granites within the central zone also exhibit a high K response. Where these features coincide especially in the granite to the SE, further ground truthing should be undertaken

Figure 4.12: Schematic representation of the juxtaposition and alignment of granitic bodies along fault zones, and significant variations in granitic zonation.

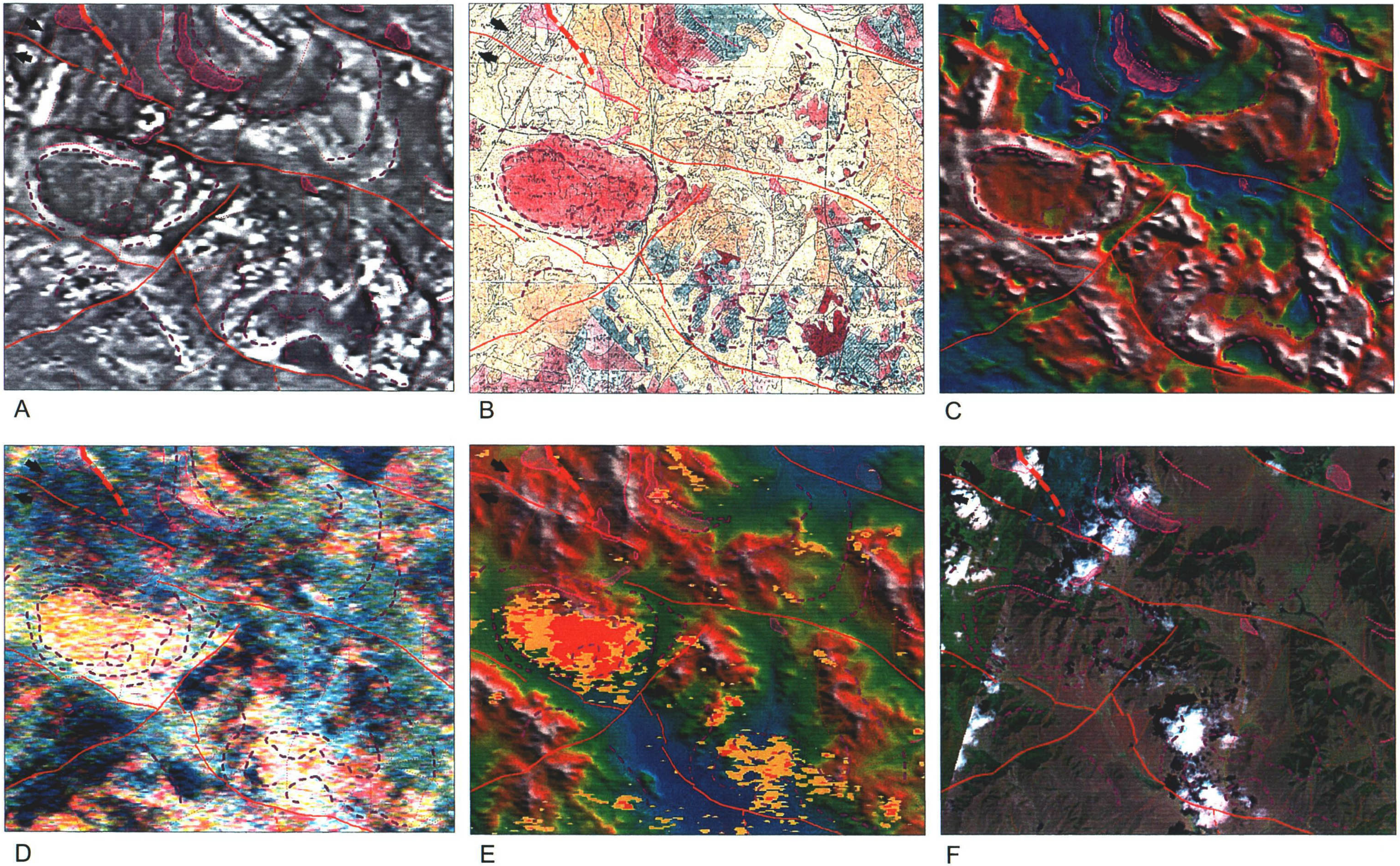

Figure 4.13: Characteristics of the Prospect 1 area.

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4.2.4 Prospect 2

A schematic summary of the geology for the prospect area is shown in Figure 4.14, while examples of data are shown in Figure 4.15. The structures within this area are not well defined. Major N to NE trending faults possibly occur to the W of the large granite body. This structure possibly has a normal displacement with downward throw to the W, as there is an apparent change in lithology between igneous intrusive units to the E and sediments to the W. There is a poorly defined approximately E - W trending structure about a quarter of the way down the prospect area. This E - W structure appears to correlate with the mapped lithological boundary. It is uncertain whether this feature represents a fault, intrusive contact, unconformity, or thrust surface.

The main interest in this area is the style of zonation, variable size and possibly the change in magnetic intensity of the igneous units. The strike of the long elliptical axis of the intrusive bodies is approximately NW. This area therefore maintains a similar structural trend to the rest of domain 3A, although with structures developed with a relatively low degree of compression across strike.

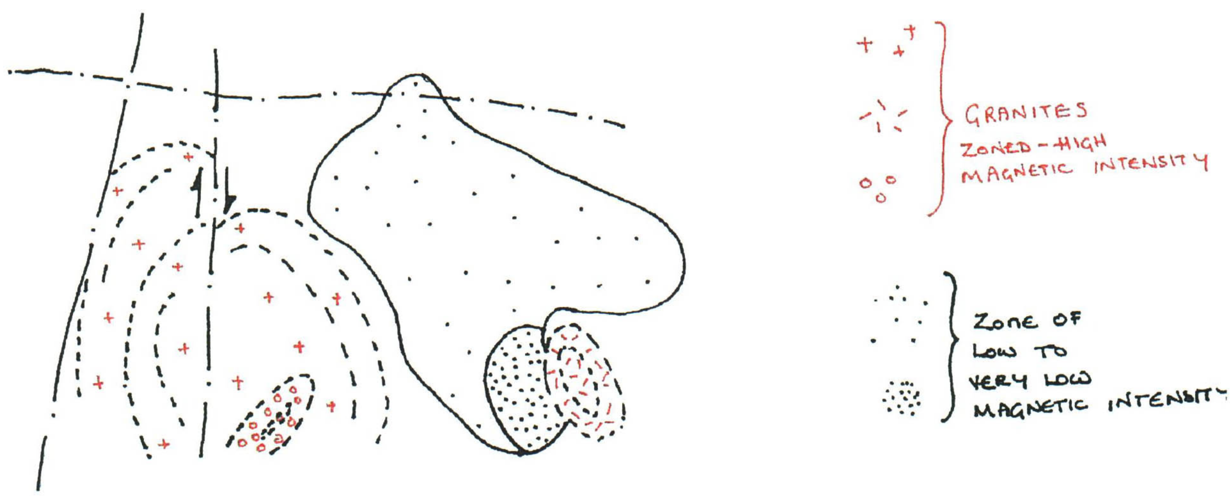

Figure 4.14: Schematic representation of the zoned granites within Prospect 2.

The radiometric response correlates well with published mapping, and there is a well-defined high K response associated with the larger zoned granite. It is uncertain whether this high K response relates to alteration of lithology.

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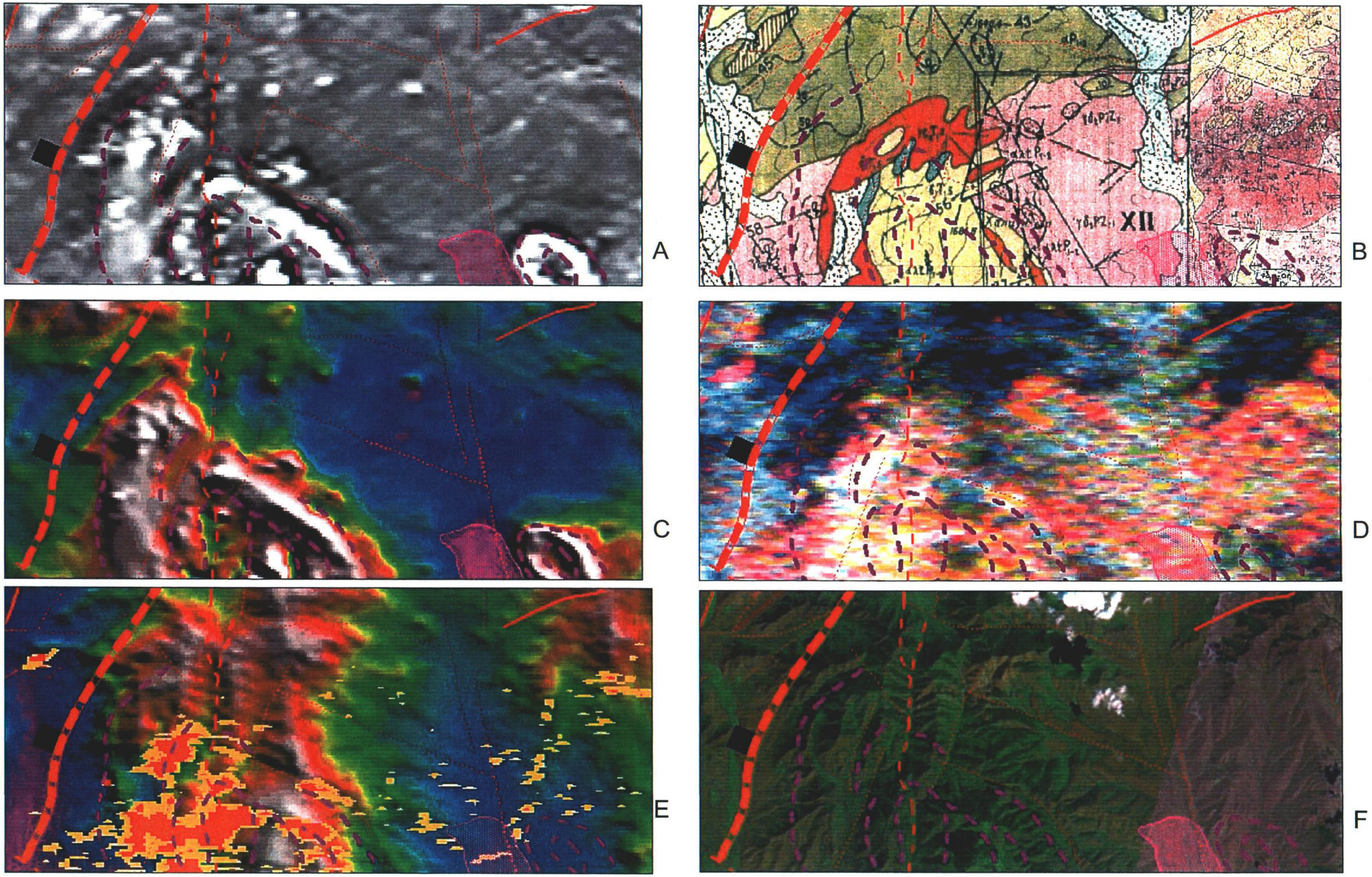

Figure 4.15: Characteristics of the Prospect 2 area.