WRM (Western Richardson Mountains)

Mineral Exploration Project – 2021 Field Work

Dawson Mining District, Yukon

NTS 116I/09 and 116I/16

Yukon Mineral Exploration Project 21-067

(Focused Regional)

Glen Prior

March 21, 2022

Contents

Appendices

Figures

Tables

Summary

The WRM project area lies within the Western Richardson Mountains of northern Yukon about 330 km north-northeast of Dawson and 40 km north-northeast of Eagle Plains. Field work during 2020 and 2021 was undertaken within NTS map areas 116I/09 and 116I/16 with access by quad and foot from the Dempster Highway. The ground evaluated by the WRM project has seen little or no previous exploration although favourable results have been obtained from properties along strike. The WRM project benefited from the Yukon Mineral Exploration Program in both 2020 and 2021 (Focused Regional Projects 20-064 and 21-067).

The WRM project area is underlain by Lower to Middle Devonian, organic-rich, calcareous shales of the upper Road River Group overlain by organic-rich, siliceous shales and cherts of the Canol Formation. Previous mineral exploration efforts within these stata have focused on a widespread, thin, sulphide layer at the contact enriched in nickel, molybdenum, zinc, platinum group elements and gold. Known informally as the NiMo horizon or the hyper-enriched black shale (HEBS) layer it commonly returns potentially economic metal grades over subeconomic widths (typically 1 to 10 cm). This horizon is a secondary exploration target of the WRM project.

The primary target of the WRM project is a sediment hosted vanadium deposit within the organic-rich shales of the upper Road River Group and Canol Formation. Vanadium is not readily accommodated within sulphide minerals and vanadium values within the sulphide-rich NiMo horizon are generally low. Within sedimentary environments vanadium is commonly associated with organic material in black shales that have accumulated in anoxic basins. The target strata of the WRM project area accumulated during the Devonian in the marine Richardson Trough, located off the coast of Laurentia (ancestral North America), under bottom water conditions that were, at times, anoxic. Previous work by industry and government has identified highly elevated concentration of vanadium in both the Road River Group and the Canol Formation within the vicinity of the WRM project area. No drilling has occurred within the WRM project area but nearby holes have intersected up to 0.40% V_2O_5 over 3.67 m in the Road River Group, 0.53% V_2O_5 over 4.19 m across the Road River Group – Canol Formation boundary, and 0.54% V_2O_5 over 1.25 m in the Canol Formation. Importantly, all of these intersections are open above and below (i.e. the core above and below these intervals was not sampled). These are potentially economic vanadium grades.

Areas identified as favourable for vanadium ± nickel, molybdenum and zinc mineralization were staked in 2020 – the more northerly Sheep Creek property (four quartz claims) and the more southerly Mount Hare property (ten quartz claims). An additional 20 quartz claims were added to the Mount Hare property in 2021, based on favourable results obtained from 2020 geochemical sampling, expanding the property to 30 quartz claims. Field work in 2021 was focused on and near these claim blocks.

The 2020 field program in the Mount Hare and Sheep Creek property areas consisted of geological mapping and the collection of (i) 27 rock chip samples, (ii) 19 stream silt samples, and (iii) 160 soil and scree samples.

The 2021 field program in the Mount Hare and Sheep Creek property areas consisted of geological mapping and the collection of (i) 29 rock chip samples, (ii) 6 stream silt samples, and (iii) 161 soil and scree samples.

Geological mapping and chemostratigraphic interpretation resulted in several revisions to existing maps with some stratigraphic contacts moved up to 400 m.

Rock sampling of an extensive shale exposure along the north bank of Rock River (Sheep Creek), in the Sheep Creek property area, consisted of the collection of 0.5 m chip samples at sites spaced about 25 m apart (roughly perpendicular to strike). Samples with significant metal concentration were obtained from sites spanning the Road River Group – Canol Formation contact including average values of:

- 0.17% V (0.31% V_2O_5), 160 ppm Ni, 56 ppm Mo and 1218 ppm Zn over a 372 m sampling distance, including
- 0.21% V (0.37% V_2O_5), 154 ppm Ni, 50 ppm Mo and 1485 ppm Zn over a 225 m sampling distance, and
- 0.27% V (0.48% V_2O_5), 169 ppm Ni, 69 ppm Mo and 1722 ppm Zn over a 55 m sampling distance (these samples were collected from sites within the lower Canol Formation).

Thirty-eight soil and scree samples were collected in 2021 along two Sheep Creek property traverses roughly perpendicular to strike.

- The southern traverse returned an average of 2242 ppm V (0.40% V_2O_5), 275 ppm Ni, 69 ppm Mo and 952 ppm Zn over a sampling distance of 150 m, including 2597 ppm V (0.46% V_2O_5), 330 ppm Ni, 82 ppm Mo and 1062 ppm Zn across a sampling distance of 104 m.
- The northern traverse probably sampled only the eastern part of the mineralized interval. It returned an average of 1681 ppm V (0.30 ppm V_2O_5), 111 ppm Ni, 34 ppm Mo, and 984 ppm Zn over 80 m.

Within the Mount Hare property area, anomalous stream silt sample results of up to 346 ppm V, 47 ppm Ni, 8 ppm Mo and 529 ppm Zn were obtained from sites sampled in 2021 underlain by the Road River Group several hundred metres east of the Road River Group – Canol Formation contact. These data suggest a source of metals at a stratigraphic level within the Road River Group not previously recognized as having economic potential.

Within the Mount Hare property area, 283 soil and scree samples were collected during 2020 and 2021 along ten traverses roughly perpendicular to the stratigraphic trend with an average sample spacing of about 25 m. Very promising vanadium results (± nickel−molybdenum−zinc) were encountered in samples overlying the lower Canol Formation and the Road River Group – Canol Formation contact area. Some of the better soil and scree results are listed below (the grades are arithmetic averages of sequential soil and scree samples collected along traverses; sampling distances are measured from the first to the last sample within the traverse interval).

- 2585 ppm V (0.46% V_2O_5), 314 ppm Ni, 74 ppm Mo and 3583 ppm Zn across 207 m, including 2922 ppm V (0.52% V_2O_5), 321 ppm Ni, 77 ppm Mo and 3679 ppm Zn across 135 m.

- 2588 ppm V (0.46% V_2O_5), 239 ppm Ni, 72 ppm Mo and 2544 ppm Zn across 126 m, including 3145 ppm V (0.56% V_2O_5), 255 ppm Ni, 85 ppm Mo and 3047 ppm Zn across 77 m.

- 2217 ppm V (0.40% V_2O_5), 253 ppm Ni, 68 ppm Mo and 2630 ppm Zn across 156 m, including 2717 ppm V (0.48% V_2O_5), 284 ppm Ni, 75 ppm Mo and 3513 ppm Zn across 75 m.

- 3504 ppm V (0.63% V_2O_5), 418 ppm Ni, 96 ppm Mo and 3709 ppm Zn across 24 m.

Recommendations for further work include additional staking, additional geological mapping (aided by air photo interpretation and chemostratigraphy), rock sampling (especially where outcrop is found near the Road River Group – Canol Formation contact), additional soil and scree sampling (mainly along strike), and additional stream sediment sampling (to evaluate metal potential at greater stratigraphic depths within the Road River Group).

The potential economic viability of a shale-hosted vanadium deposit (± accessory elements) within the Sheep Creek or Mount Hare properties, based on the indications of grades and widths obtained during the 2020 and 2021 field sampling, should be evaluated from mining, metallurgical, environmental and societal perspectives. If the evaluation is encouraging an initial program of trenching and/or drilling is recommended to explore the metal zones identified by the WRM project.

Location, Access and Land Status

The WRM project area is located in the western Richardson Mountains of northern Yukon and is centred roughly 40 km northeast of Eagle Plains, located on the Dempster Highway, and about 330 km north-northeast of Dawson (Figures 1 to 3). It is located within the Dawson Mining District. Exploration work on the WRM project in 2021 was undertaken in the Sheep Creek and Mount Hare property areas east of the Dempster Highway within NTS map areas 116I/09 and 116I/16. Access to the field areas was gained by quad and foot from the highway.

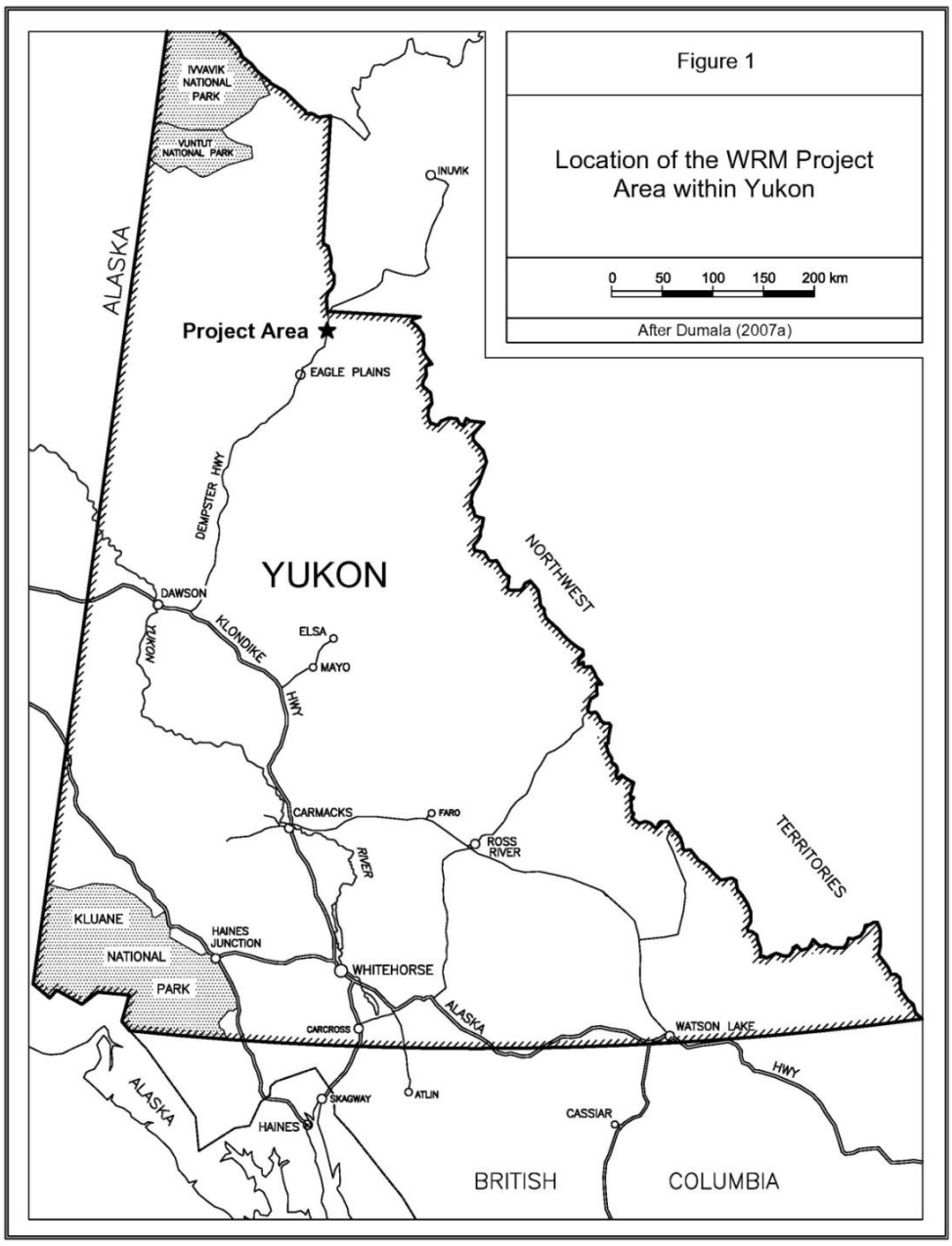


Figure 1
Location of the WRM Project Area within Yukon
0 50 100 150 200 km
After Dumala (2007a)
IVVAVIK NATIONAL PARK
VUNTUT NATIONAL PARK
INUVIK
ALASKA
Project Area
EAGLE PLAINS
DEMPSTER HWY
YUKON
NORTHWEST
TERRITORIES
DAWSON
YUKON
KLONDIKE
HWY
ELSA
MAYO
CARMACKS
FARO
ROSS RIVER
RIVER
KLUANE
NATIONAL
PARK
HAINES JUNCTION
WHITEHORSE
ALASKA
CARCROSS
WATSON LAKE
HWY
ALASKA
SKAGWAY
ATLIN
HAINES
CASSIAR
BRITISH
COLUMBIA

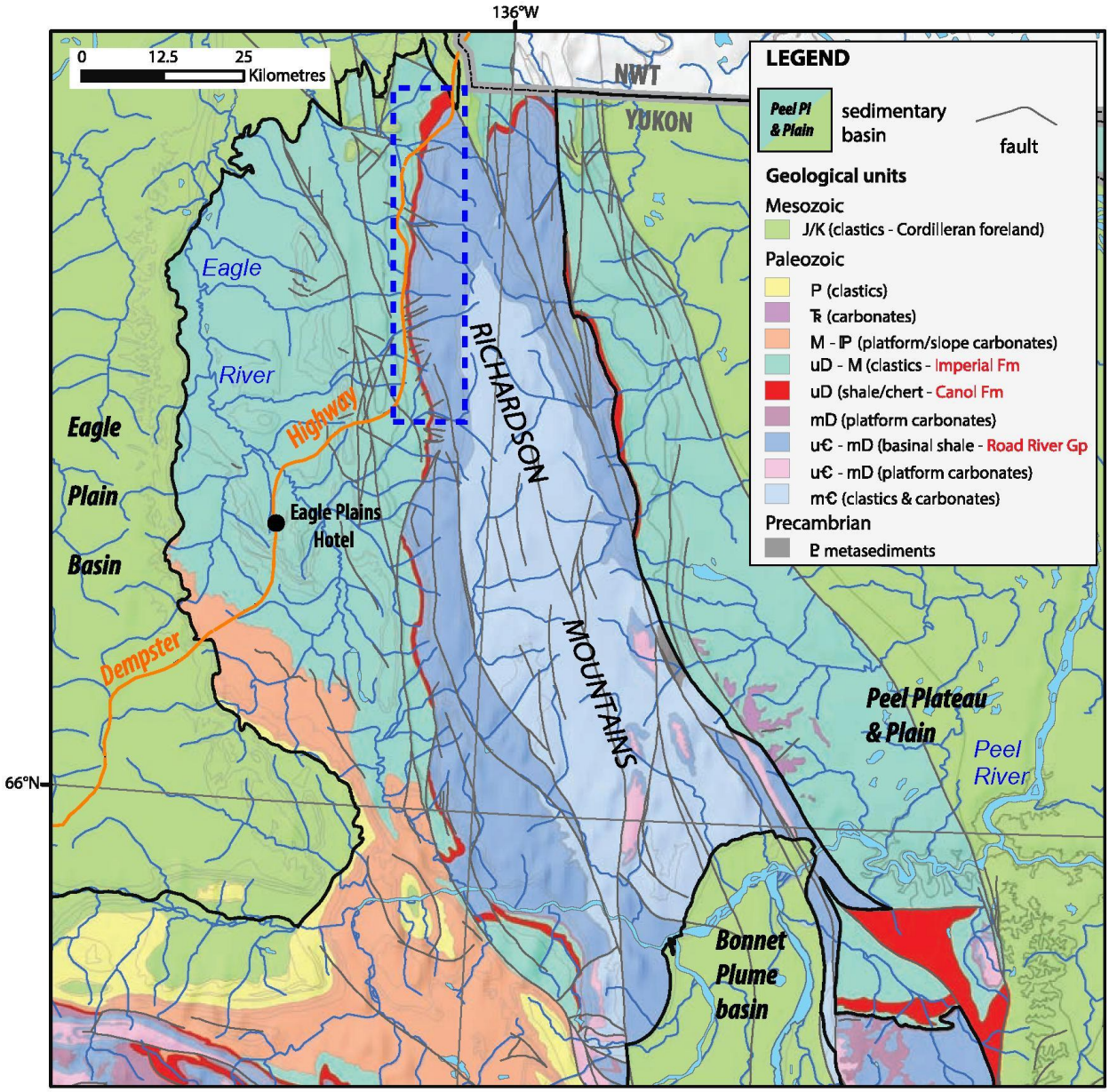


Figure 2. Location of the general WRM project area (dashed blue rectangle) and regional geology. Modified after Fraser and Hutchinson (2017).

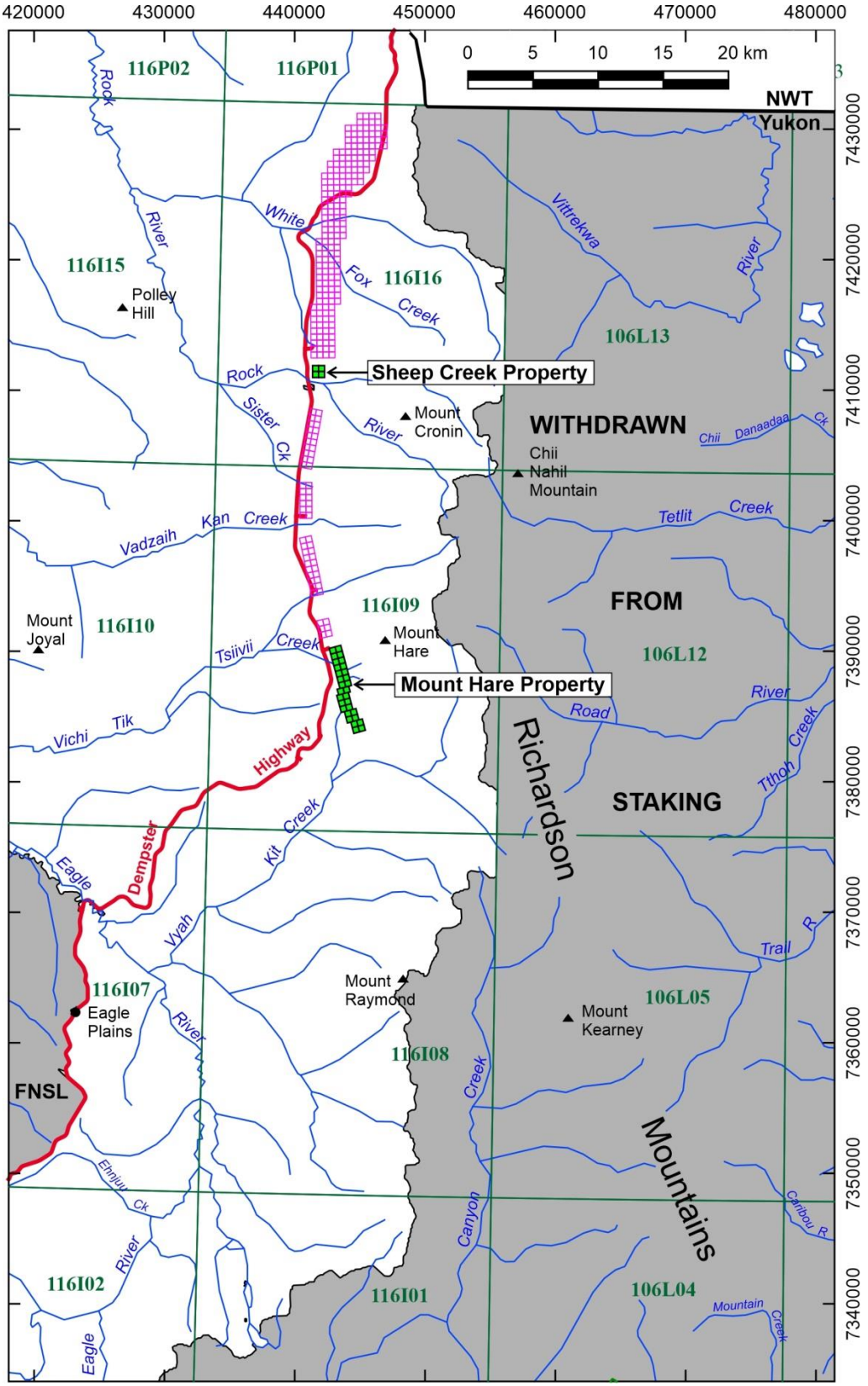


Figure 3. Location of the Sheep Creek and Mount Hare properties. Sheep Creek (SC) and Mount Hare (MH) claims shown in green. Other claims shown with magenta outlines. FNSL = First Nation Settlement Land.

Physiography

The WRM project area lies within the foothills on the western flank of the Richardson Mountains. Elevations range from about 600 m to 1100 m above sea level. The area is drained by the Rock River and westerly flowing tributaries of the Rock and Eagle rivers (Figure 3).

“Outcrop is only found along some of the more deeply incised drainages and steeper hillsides. Vegetation consists of stunted spruce, buckbrush, moss and grass (Dumala, 2007a). Ridges, some of which are locally barren of vegetation, have northerly trends reflecting the underlying bedrock stratigraphy.

History

Government Mapping and Geochemical Surveying

The project area was mapped by the Geological Survey of Canada (GSC) at 1:250,000 scale (Norris, 1981) and at 1:125,000 scale (Cecile et al., 1982). The Norris map (Eagle River; NTS map area 116I) was based on geological work undertaken in 1975. Norris also produced GSC Memoir 410, which addresses Devonian stratigraphy (Norris, 1985), and GSC Bulletin 422, which discusses geology, mineral potential and hydrocarbon potential (Norris, 1997).

In 1977 the Geological Survey of Canada released reconnaissance stream sediment geochemical data for parts of NTS map areas 106E, 106L and 116H and 116I that included data for samples from 116I/09 and 116I/16 (Hornbrooke and Lynch, 1977). The average sample density was 1 sample per 13 km^2.

In 2006 the Yukon Geological Survey released a mineral assessment of the Eagle Plain study area, including field work results for 1995, 1996 and 2000 (Heon, 2006), that covers the 2020 project area.

> ***Stream sediment geochemistry:*** As part of the mineral assessment of the Eagle Plain study area a regional stream sediment geochemical survey was undertaken by the Geological Survey of Canada in order to complete coverage of the study area. These samples were analyzed for gold plus a 32 element ICP suite. In addition, stream sediment samples from the 1976 survey were reanalyzed for a similar suite of elements (Heon, 2006).
>
> ***Rock geochemistry:*** The Eagle Plain mineral assessment report also includes a considerable amount of rock geochemical data for rock samples collected in 1995, 1996 and 2000 (Heon, 2006).

Industry Exploration

Industry activities of relevance to the 2020 project area include the 2007 exploration programs on the former Fox property (Dumala, 2007a), Sun property (Dumala, 2007b) and Rich property (Dumala, 2007c), and the 2008 program on the Rich property (Gregory, 2008). Dumala (2007b) also references a 2005 soil sampling program by Shawn Ryan. The locations of these former mineral properties are shown in Figure 4 and exploration activities are summarized below.

Fox Property: "In 2007, 5 rock, 291 soil and 61 silt samples were collected on the Fox property …. A total of 425.20 m of diamond drilling was completed in 4 holes. All drill moves were made by helicopter. The 2007 holes tested along the contact between the Canol Formation and Road River Group" (Dumala, 2007a, p. 4).

Sun Property: "Soil samples collected in 2005 from what is now the Sun property by Shawn Ryan returned up to 590 ppm nickel, 620 ppm molybdenum and 6831 ppm zinc" (Dumala, 2007b, p. 4).

"In 2007, 126 soil and 2 silt samples were collected on the Sun property …. A total of 295.66 m of diamond drilling was done in 3 holes to test for NiMo mineralization along the prospective contact (Dumala, 2007b, p. 4).

Rich Property: "In 2007, 15 chip, 3 rock specimen, 625 soil and 66 silt samples were collected for the Rich property.… A helicopter-borne versatile time domain electromagnetic (VTEM) and magnetic survey was conducted over the Rich property in summer 2007 by Geotech Limited of Aurora Ontario…. A total of 2485.98 m of diamond drilling were completed in 25 holes. The 2007 holes tested along the Canol-Road River contact over a strike length of 7 km" (Dumala, 2007c, p. 4-5).

In 2008 a total of 909.21 m of diamond drilling was completed in 2 holes on the Rich property (Gregory, 2008).

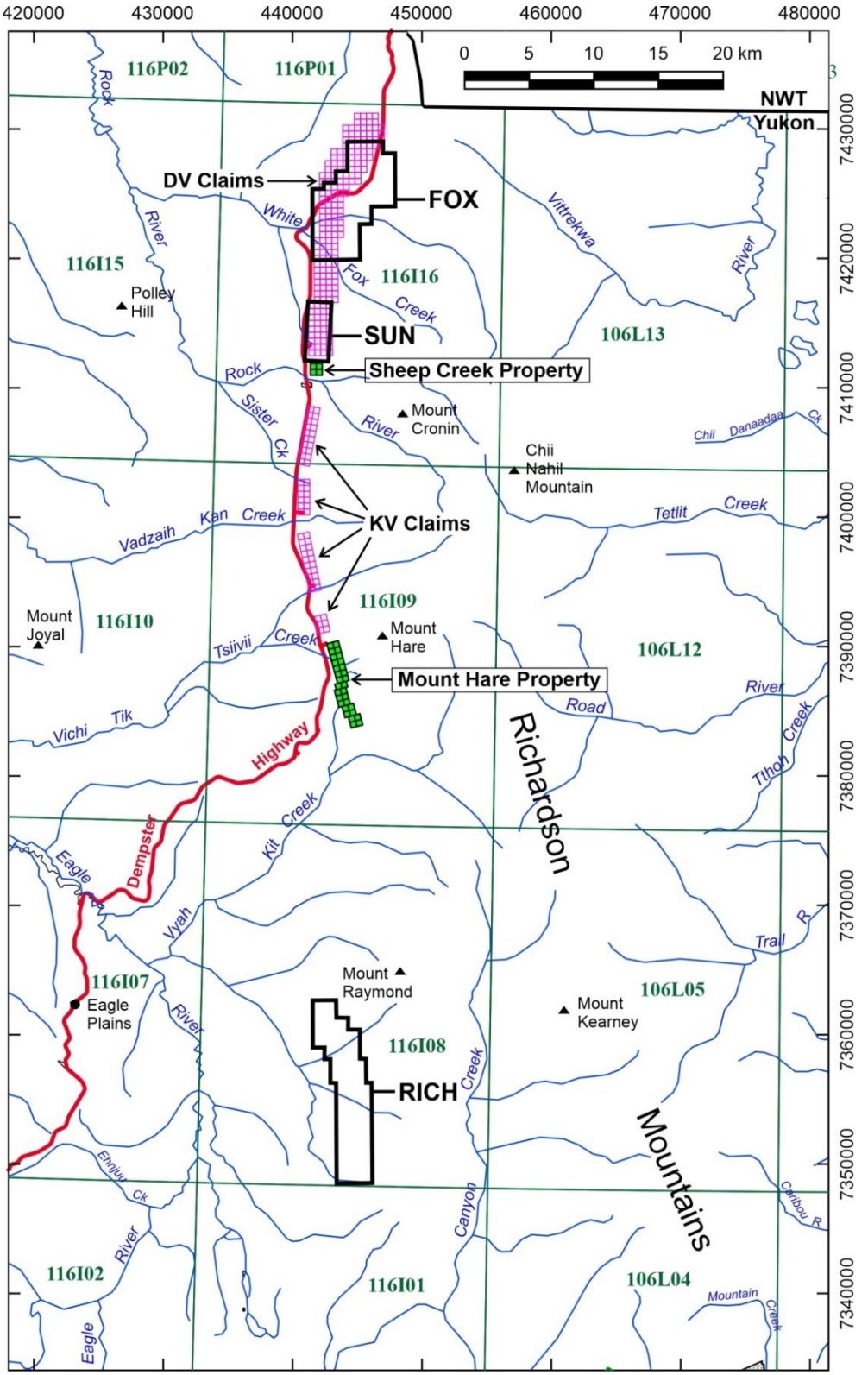


Figure 4. Former and current property locations. The former Fox, Sun and Rich mineral properties are shown with black outlines. Sheep Creek (SC) claims and Mount Hare (MH) claims shown in green. Other claims shown in magenta.

Regional Geology

Regional Setting

The WRM project area lies within Devonian basinal facies strata of Ancestral North America (Figure 5). The area is situated on the western flank of the Richardson Mountains and lies east of the Eagle Plain Basin, west of the Peel Basin and north of the Bonnet Plume Basin (Figure 6; note that these are post-Devonian basins). "Devonian marine sedimentary rocks in north Yukon … were deposited on the northern and western fringes of the Laurentian craton (ancestral North America)…. Two extensive carbonate platforms persisted in present-day northern Yukon and northwestern NWT throughout Early to Middle Devonian time: the Mackenzie Platform … in the east and the Yukon Stable Block … in the west. These carbonate platforms (represented by the Hume and Ogilvie formations …) were separated by the Richardson trough…, a Cambrian to Late Devonian intracratonic depression thought to be connected during the Early to Middle Devonian to the south with Selwyn basin, developed on the western margin of Laurentia, and, in the north, to the Hazen and Rapid troughs that developed on the northern margin of Laurentia…. The trough has been interpreted as a failed continental rift arm or aulacogen …." (Fraser and Hutchinson, 2017, p. 732-733).

The WRM project area "… lies along the western margin of the Richardson Fault Array, a cluster of north-trending curvilinear, near vertical faults. Episodic reactivation of the Richardson Fault Array in Early and Middle Paleozoic formed a north- to northwest-trending intracratonic depression known as the Richardson Trough (Dumala, 2007a, p. 2). "In the Richardson trough … Lower Cambrian to Middle Devonian strata are assigned to the basinal Road River Group … a thick sequence of limestone, shale, chert, dolostone, and conglomeratic debris flows deposited from the adjacent carbonate platforms …. An extended period of transgression during the Middle to Late Devonian drowned these platforms, depositing deeper water black shales in north Yukon and northwestern NWT as the Canol Formation and in east-central Alaska as the McCann Hill Chert …. These shales are likely time equivalent to the distal Besa River and Muskwa formations in Liard and Horn River basins, and the Duvernary Formation in Alberta …. Beginning in the Late Devonian, black shale deposition was terminated by foreland basin sedimentation sourced from the Ellesmerian orogen in the Canadian Arctic Islands … and which now comprises the Imperial, Ford Lake, and Nation River formations" (Fraser and Hutchinson, 2017, p. 733). "The entire stratigraphic section is folded by a large-scale anticline that plunges to the north. This anticline is called the Richardson Anticlinorium and its axis approximately coincides with the centre of the trough. To the east, the Richardson Trough is bound by the Trevor Fault and to the west, by the Deception Fault" (Dumala, 2007a, p. 2).

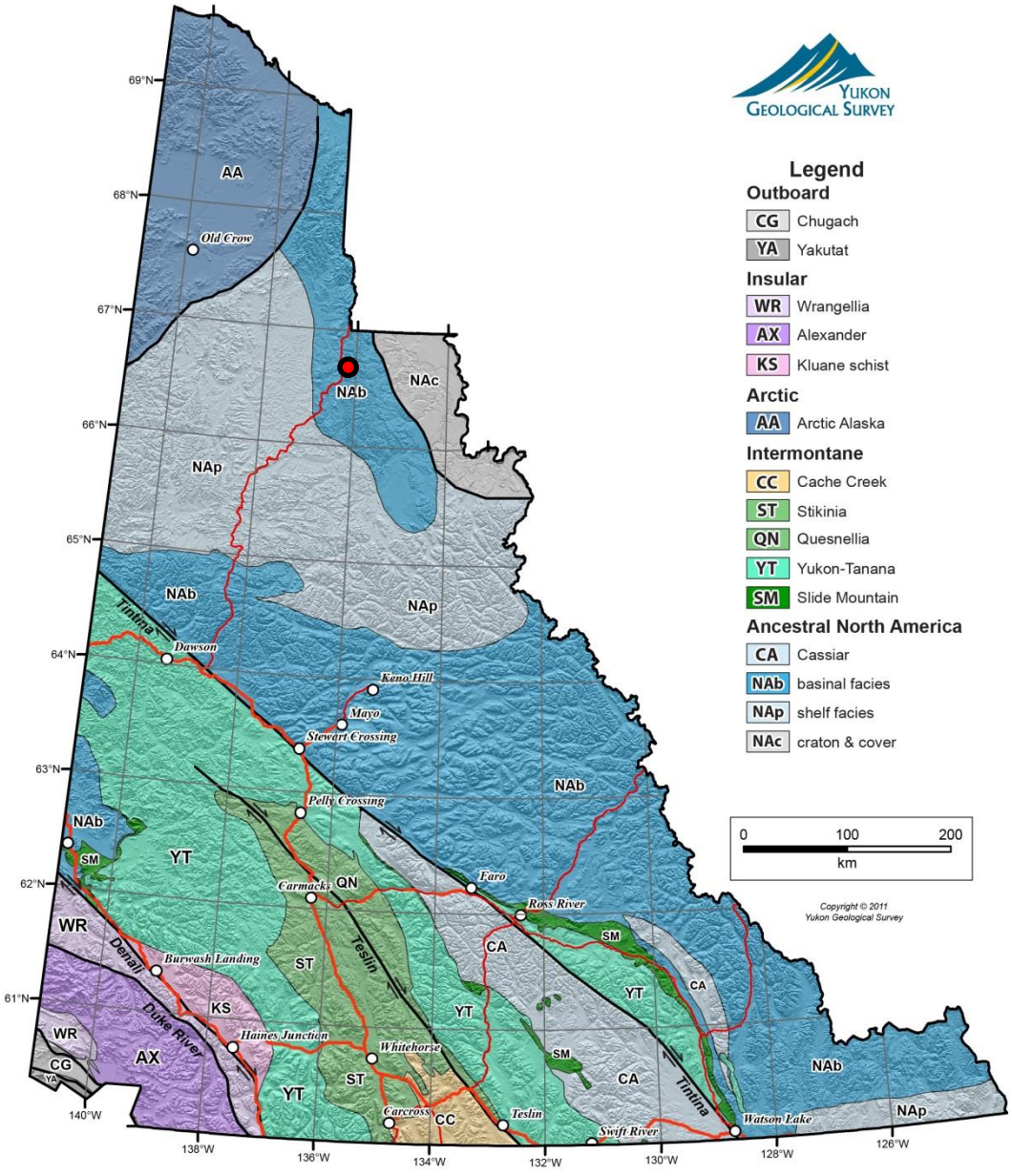


Figure 5. Yukon terrane map (Colpron and Nelson, 2011). The location of the project area is indicated by the red dot.

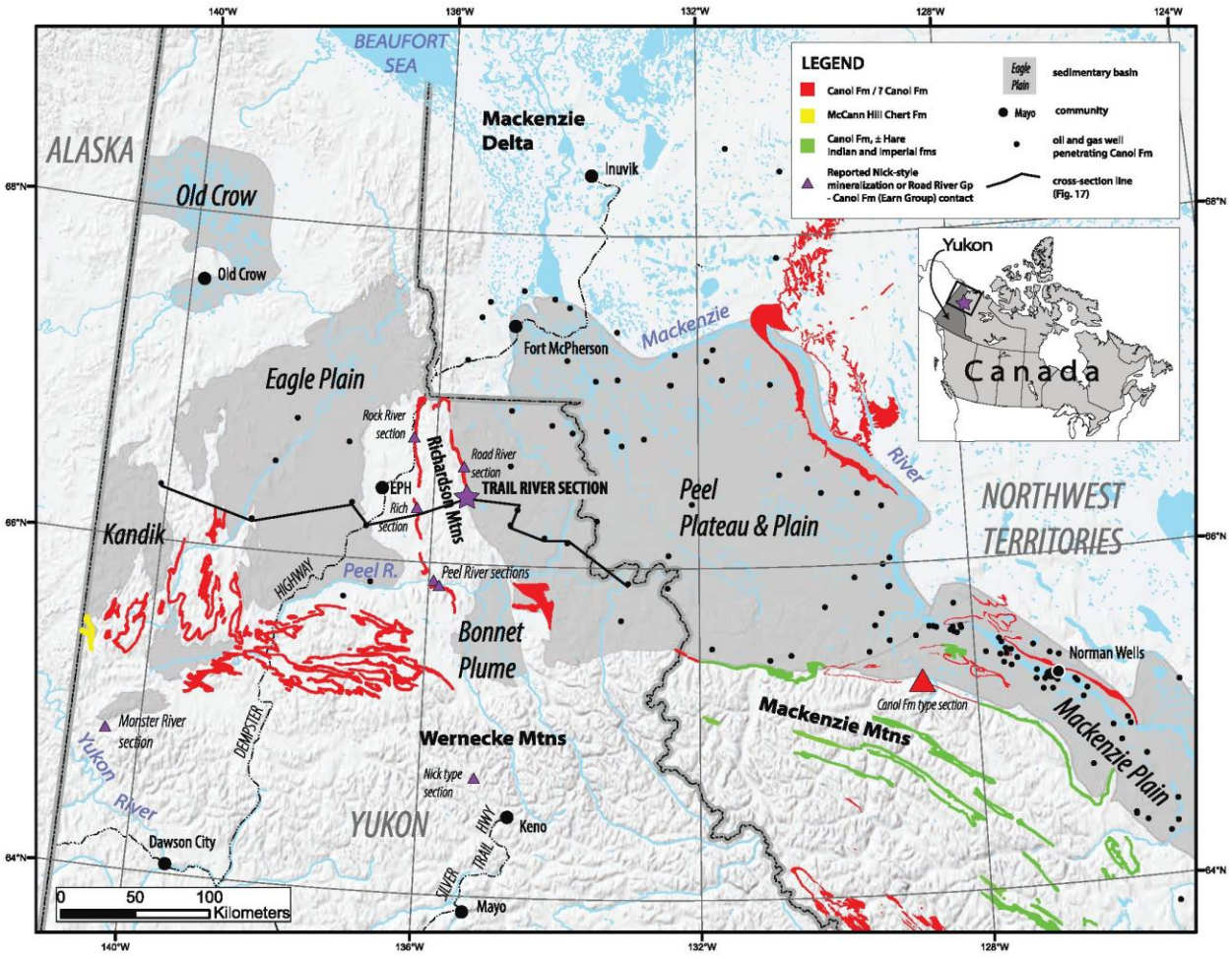


Figure 6. Map of northern Yukon and northwestern Northwest Territories displaying outcrop extent of the Canol Formation and its probable correlatives north of 64°N. From Fraser and Hutchison (2017) after Yukon Geological Survey (2015) and Okulitch and Irwin (2014). Note that the sedimentary basins shown are post-Devonian. The Rich section corresponds to the Moss section of Gadd et al. (2109). The Rock River section on the west side of the Richardson Mountains lies within the 2020 project area. Note: the nickel-molybdenum (NiMo) horizon appears to be faulted out at the Road River section and appears to be not developed at the Trail River and Road River sections (T. Fraser, pers. comm. 2020). EPH = Eagle Plains Hotel.

A map showing Paleozoic paleogeographic elements in part of northeastern Yukon, including the Richardson Trough, is shown in Figure 7. “This tectonic depression has been interpreted as a failed rift … and is bound to the east by the Mackenzie platform and to the west by the Yukon Stable Block, which for much of the early Paleozoic was a stable shelf (… Morrow, 1999). At the time of formation, the Richardson trough was situated near the equator…. The Richardson trough is characterized by >100 m of fine-grained, carbonaceous siliciclastic rocks of the Late Cambrian to Middle Devonian Road River Group (… Morrow 1999). The Canol Formation overlies the Road River Group, and consists of up to approximately 220 m of Middle Devonian to early Late Devonian siliceous, carbonaceous shale (Hutchison and Fraser, 2015). The nature of the contact between the Road River Group and the overlying Canol Formation has been described as both conformable … and unconformable…. At this contact, a discontinuous and thin (1–10 cm thick) Ni-Mo-Zn-PGE-rich HEBS” [hyper-enriched black shale] “layer occurs at many localities throughout northern Yukon…. The Late Devonian Imperial Formation, a deep-water shale interbedded with turbiditic sandstone, overlies the Canol Formation …” (Gadd et al., 2019, p. 164-166).

A west to east diagrammatic illustration of stratigraphic relationships of lower Paleozoic strata within and adjacent to the Road River Group is shown in Figure 8. A Devonian and Carboniferous lithostratigraphy of western Canada extending from near the northern Yukon – Alaska Border to central Alberta is presented in Figure 9.

A west to east stratigraphic section across the Eagle Plain Basin and Richardson Anticlinorium is shown in Figure 10. Cambrian to Devonian strata within the Richardson Anticlinorium were deposited within the Richardson trough. Note the absence of the Oglive Formation (limestone), which results in the Canol Formation lying immediately above the Road River Group, and the thickening of the Canol Formation within the Richardson Anticlinorium.

A subsurface stratigraphic cross-section of lower Paleozoic strata across the Richardson Trough, with gamma and sonic logs, is shown in Figure 11. The diagram illustrates (i) an increase of Canol Formation thickness within the Richardson Trough, (ii) an increase in radioactivity within Canol Formation strata and (iii) that Canol Formation radioactivity is less pronounced in the Richardson Trough well compared to wells through the Yukon Stable Block and the MacKenzie – Peel Shelf.

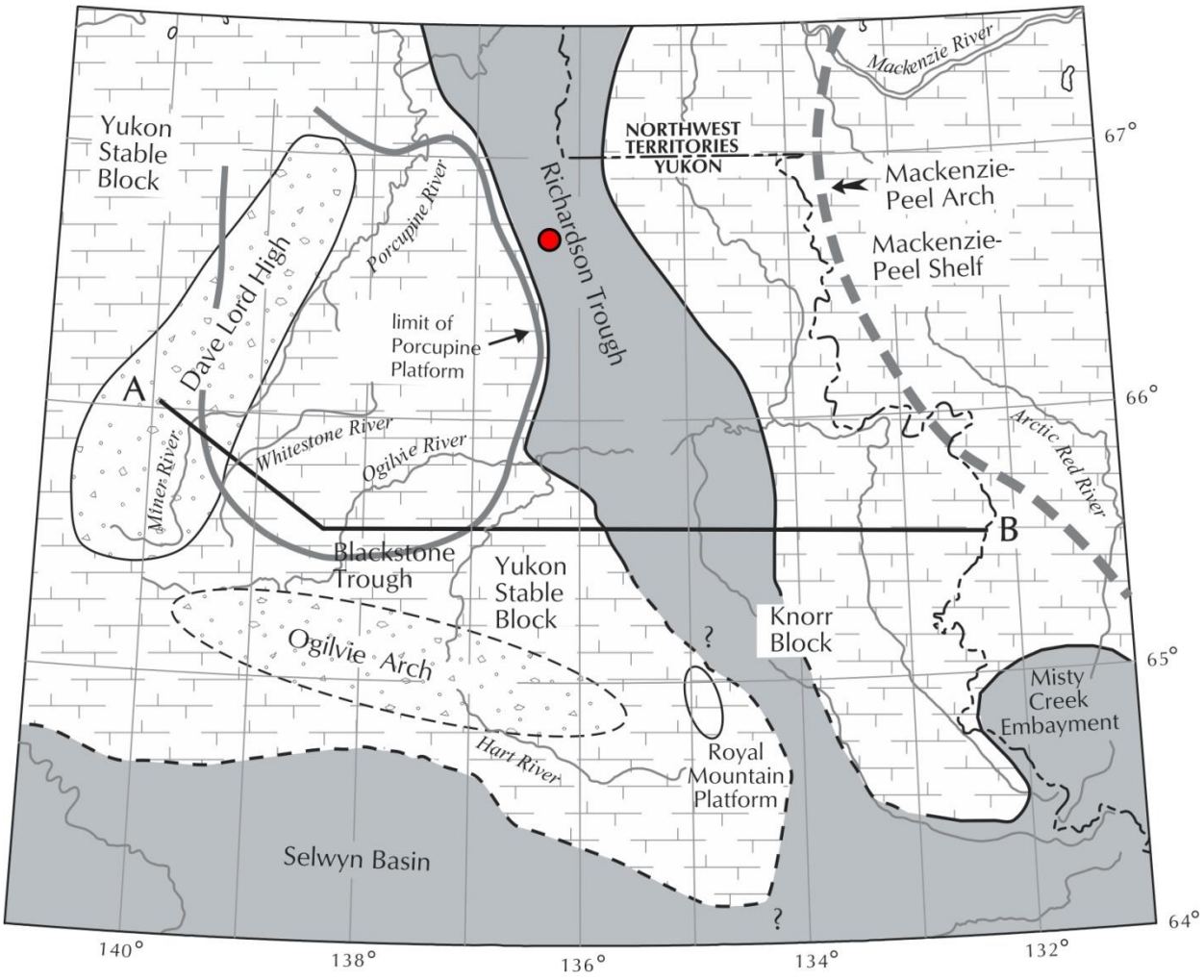


Figure 7. Paleozoic paleogeographic elements in part of northern Yukon including the Richardson Trough (Morrow, 1999; Osadetz et al., 2005). The red dot indicates the project area. Areas of predominantly shallow water carbonate deposition are filled with a modified brick pattern while the shaded regions are predominately regions of basinal shale deposition. The Mackenzie-Peel Shelf is equivalent to the Mackenzie Platform. Devonian and older succession along line A-B are illustrated in Figure 8.

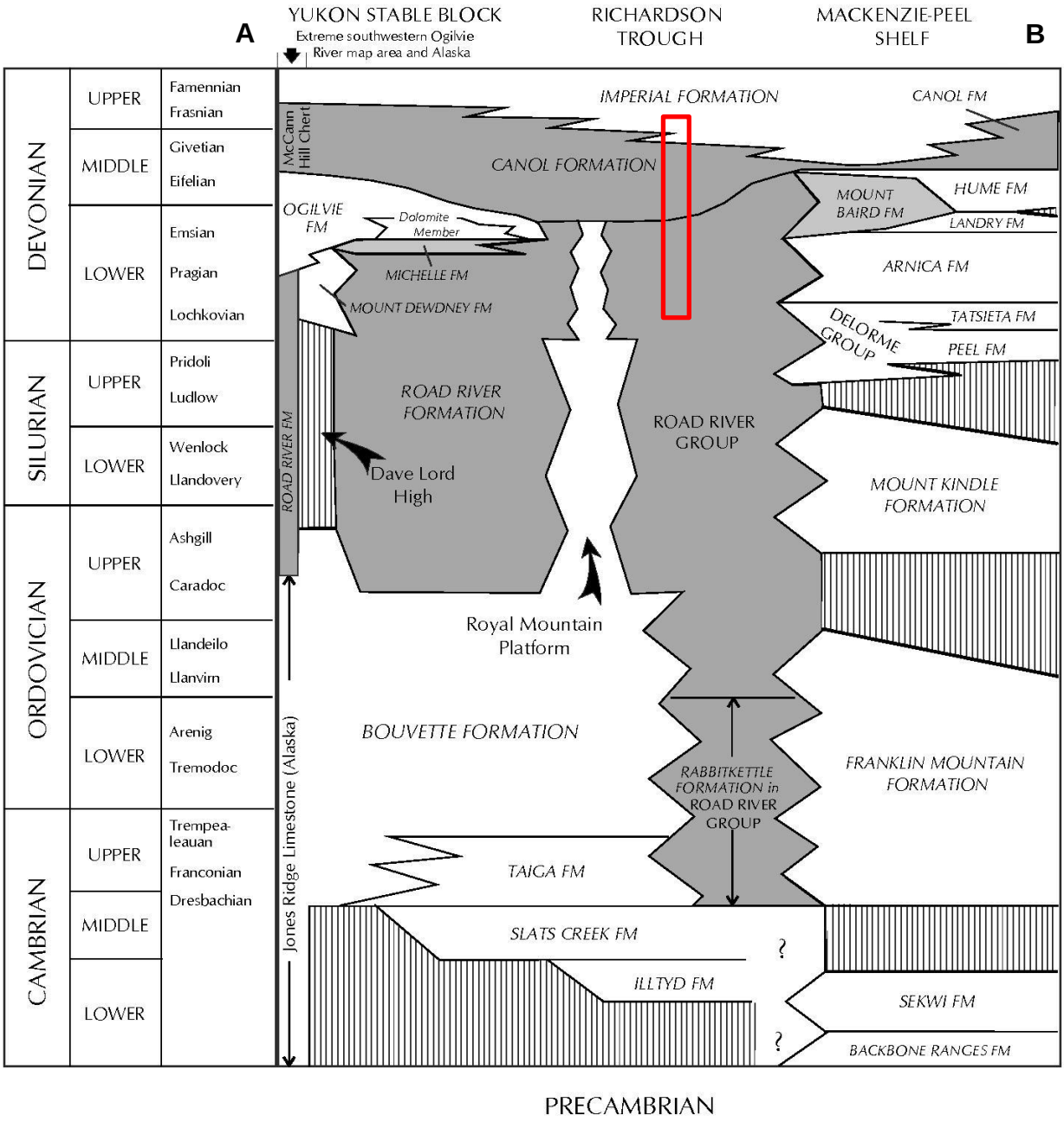


Figure 8. West to east diagrammatic illustration of stratigraphic relationships of lower Paleozoic (Cambrian to Devonian) strata within and adjacent to the Richardson Trough (Morrow, 1999; Osadetz et al, 2005). Location of section (A-B) shown in Figure 7. WRM project area stratigraphy shown with red rectangle.

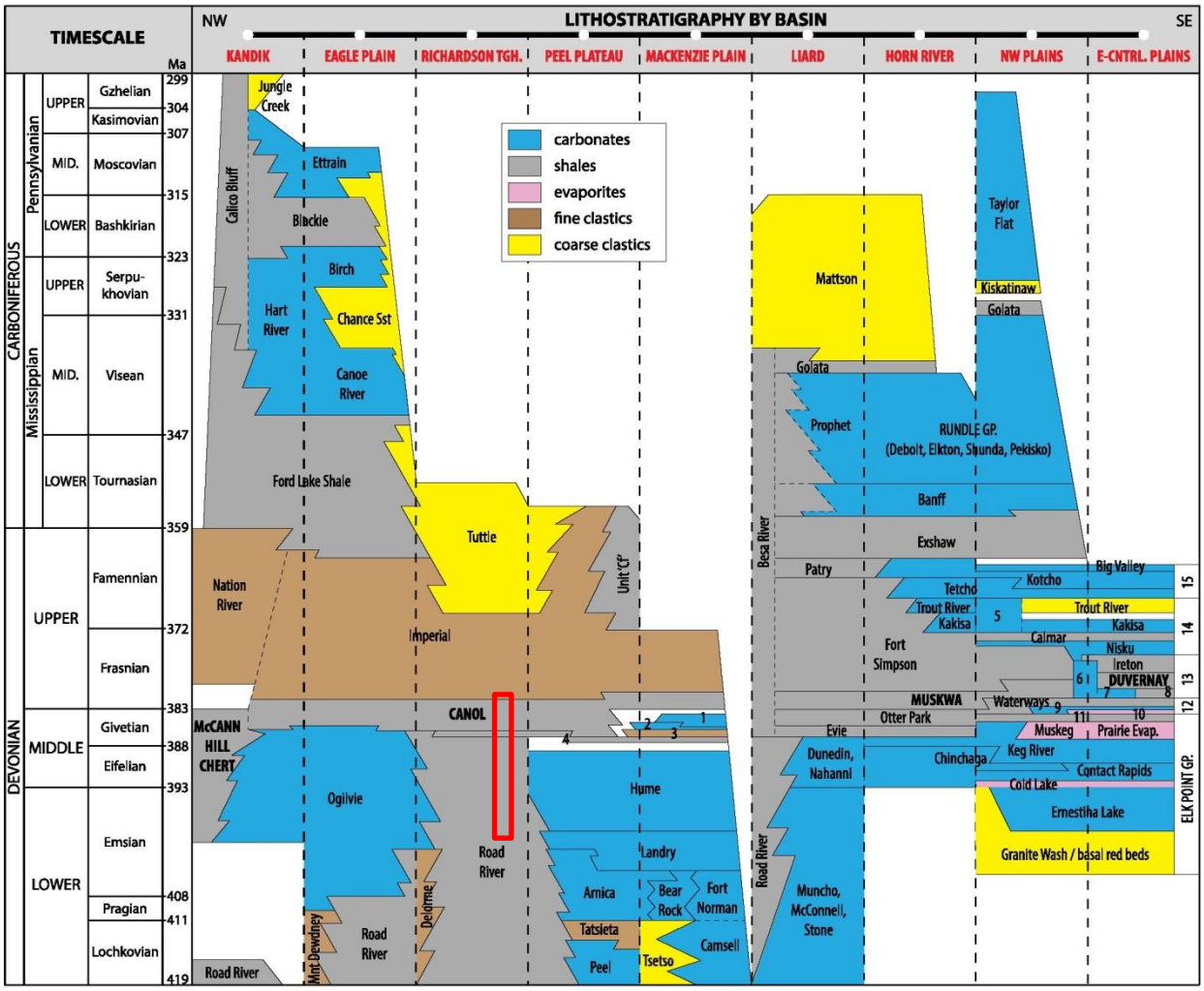


Figure 9. Devonian and Carboniferous lithostratigraphy of western Canada extending from near the northern Yukon – Alaska border (NW) to central Alberta (SE). From Fraser and Hutchinson, 2017). WRM project area stratigraphy shown with red rectangle. Stratigraphy compiled from the following: Yukon Territory (eastern Kandik, Eagle Plain, Richardson trough, Peel Plateau; Pigage 2007); Alaska (western Kandik; Van Kooten et al. 1997); Northwest Territories (Mackenzie Plain; Pyle et al. 2014); British Columbia (Liard and Horn River; Ferri et al. 2013, 2015); NW and E-Central Alberta Plains (Alberta Geological Survey, 2015). Numbered units: (1) Kee Scarp Mb, (2) Ramparts Fm, (3) Hare Indian Fm (incl. Bell Creek Mb), (4) Bluefish Mb, (5) Graminia Fm, (6) Leduc Fm, (7) Cooking Lake Fm, (8) Majeau Lake Fm, (9) Slave Point Fm, (10) Fort Vermilion Fm, (11) Watt Mountain Fm, (12) Beaverhill Lake Gp, (13) Woodbend Gp, (14) Winterburn Gp, (15) Wabamun Gp.

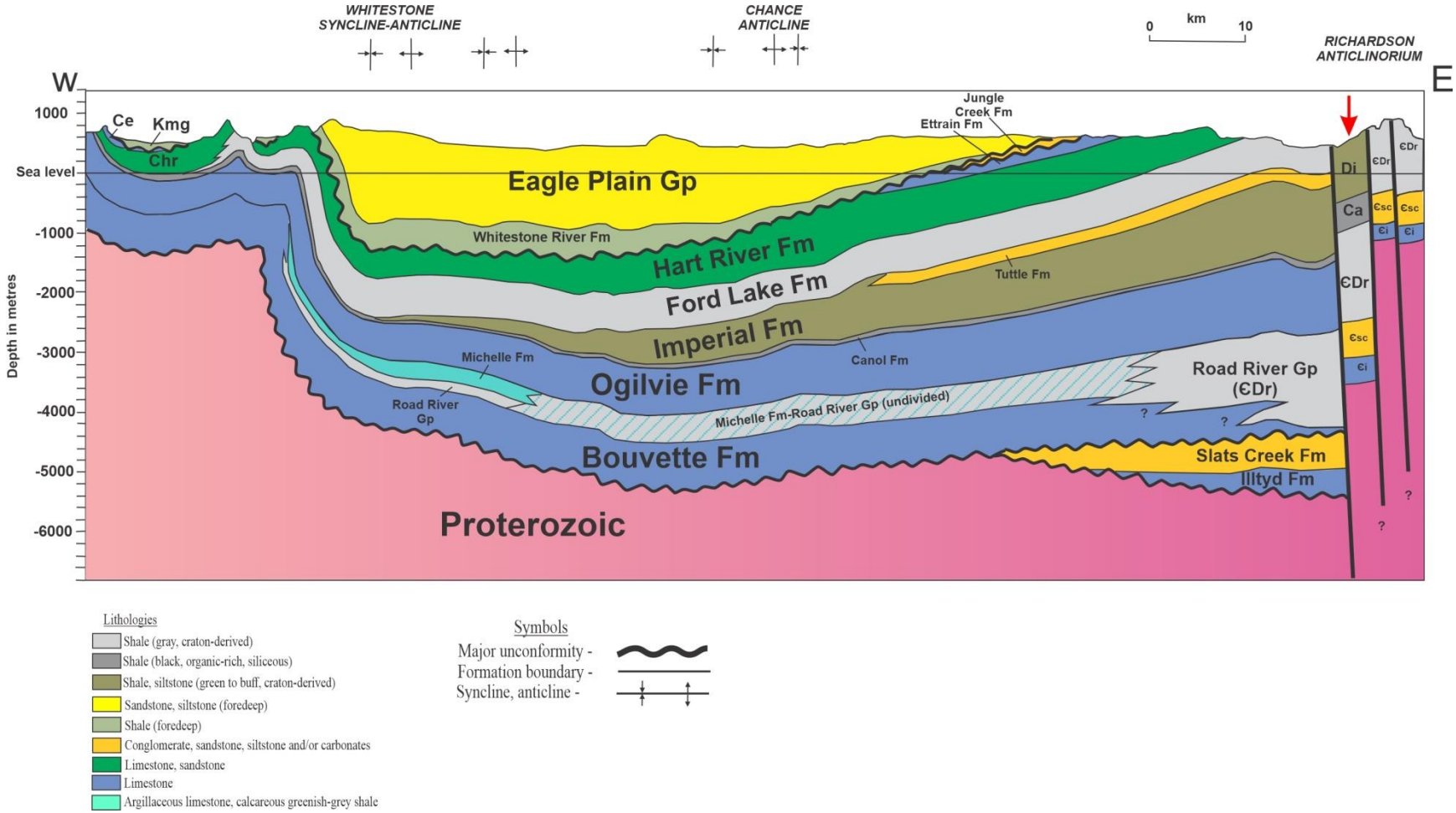


Figure 10. West to east stratigraphic section across the Eagle Plain Basin and Richardson Anticlinorium along 66°07'30" latitude within NTS map areas 116I and 116K (Morrow, 1999; Hannigan, 2014). The part of the section analogous to the project area is indicated by red arrow. Note that within the Richardson Anticlinorium (Cambrian to Devonian Richardson trough) the Oglive Formation (limestone) is absent, which results in the Canol Formation lying above the Road River Group, and the Canol Formation is thicker.

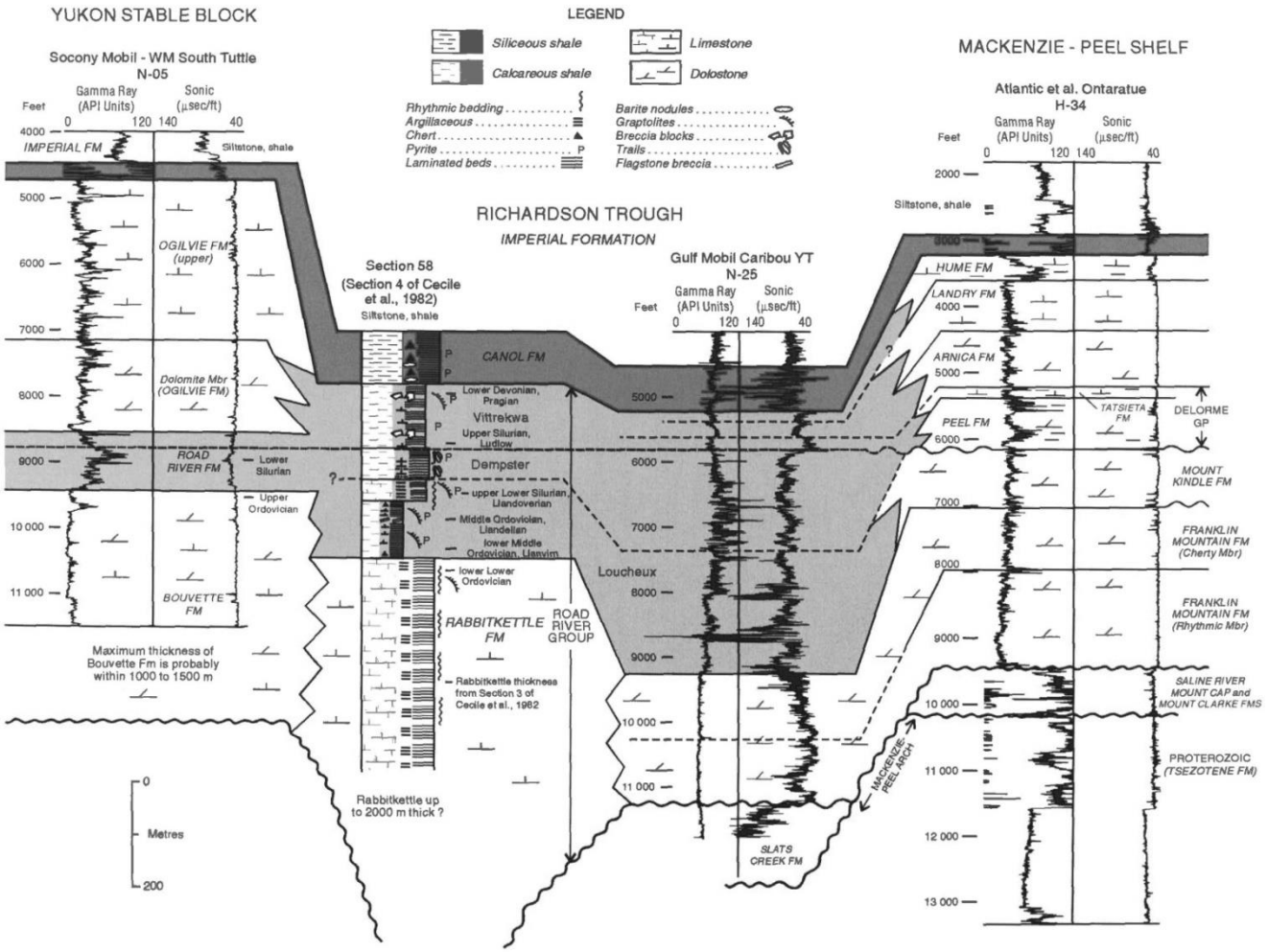


Figure 11. Subsurfacestratigraphic cross-section of lower Paleozoic strata showing the Yukon Stable Block in the west, the Richardson Trough, and the MacKenzie – Peel Shelf in the east (Morrow, 1999). The Sacony Mobile WM South Tuttle well (N-05) is located about 30 km southwest of the WRM project area and the Gulf Mobile Caribou YT (N-25) lies about 70 km southeast of the project area. Note increase in radioactivity (gamma ray log) in Canol Formation but that this increase in radioactivity is less pronounced in the Gulf Mobile Caribou YT well within the Richardson Trough (also note that the gamma ray curve "wraps" where values exceed 120 API units and the scale changes from 0-120 to 120-240 API units and that the vertical scales are in feet).

Richardson Trough Depositional History

Late Cambrian to Early Ordovician: "The oldest formation in the Road River Group is the Rabbitkettle Formation in Richardson Trough and western Selwyn Basin (Late Cambrian to Early Ordovician). It consists of dark grey to black argillaceous lime mudstone rhythmically alternating with silty limestone (Cecile et al., 1982). The formation is equivalent to Franklin Mountain Formation and ranges in thickness between 65 to 2000 m in Richardson Trough" (Hannigan, 2014, p. 12; Figure 8).

Middle Ordovician to Middle Devonian: "Upper Road River strata in Richardson Trough, Selwyn Basin and Misty Creek Embayment range in age from Middle Ordovician to Middle Devonian … making these rocks equivalent to the Mount Kindle to Hume formation platformal successions to the east. Three informal units were recognized by Cecile et al. (1982) in Upper Road River strata in Richardson Trough; Loucheux, Dempster and Vittrekwa. Loucheux strata consist of black, graptolitic silicified shale, limestone, black chert and resedimented carbonate breccia. Dempster strata contain argillite and argillaceous dolostone, calcareous shale, argillaceous lime mudstone, silty dolostone and granule conglomerate. Vittrekwa strata consist of rusty, black siliceous shale, conglomerate and lime mudstone (Cecile et al., 1982)" (Hannigan, 2014, p. 12; Figures 8 and 11).

"Major transgression signalled the beginning of deposition of the Middle Devonian Hume assemblage …. In Richardson and Blackstone troughs, dark and siliceous basinal facies shales of the Road River Group accumulated …. On Peel Platform, the siliciclastic basin fill consists of a unit of dark bituminous highly radioactive shale called the Bluefish Member of the Hare Indian Formation" (Hannigan, 2014, p. 14).

Late Middle Devonian: "During late Middle Devonian time, sedimentation patterns changed dramatically as turbiditic, chert-rich clastics derived from the north and west flooded the northern Cordillera…. Another change was an abrupt transition from shallow water to much deeper water sedimentation which is marked by deposition of the euxinic black siliceous Upper Devonian Canol shale…. Thicknesses range from 110 to 225 m. The Canol Formation conformably overlies the Road River Group in Richardson and Blackstone troughs and the Ogilvie Formation on the Yukon Stable Block. With the exception of a few isolated carbonate platform remnants from the Porcupine Platform, this 'Lower Fairholme' stratigraphic succession marks the end of carbonate platform deposition across all Lower Paleozoic shelf areas in northern Yukon" (Hannigan, 2014, p. 15; Figures 8 and 9).

Early Upper Devonian: "Early Upper Devonian Imperial deposition consists of siliciclastics dominated by detrital influx from the Ellesmerian Orogeny to the north and east. An Imperial depocentre occurs along the northern periphery of the basin where 2000 m of siliciclastic sediment accumulated during Late Devonian time…. Turbiditic flysch facies dominate beneath Peel Platform" (Hannigan, 2014, p. 15; Figures 8 and 9).

Regional Devonian Stratigraphy

A generalized stratigraphic column of Devonian units in the Richardson trough is presented in Figure 12. This diagram includes schematic stratigraphic sections displaying detailed hyper-enriched black shale (HEBS) sections at four locations in northern Yukon (see Figure 13 for section locations).

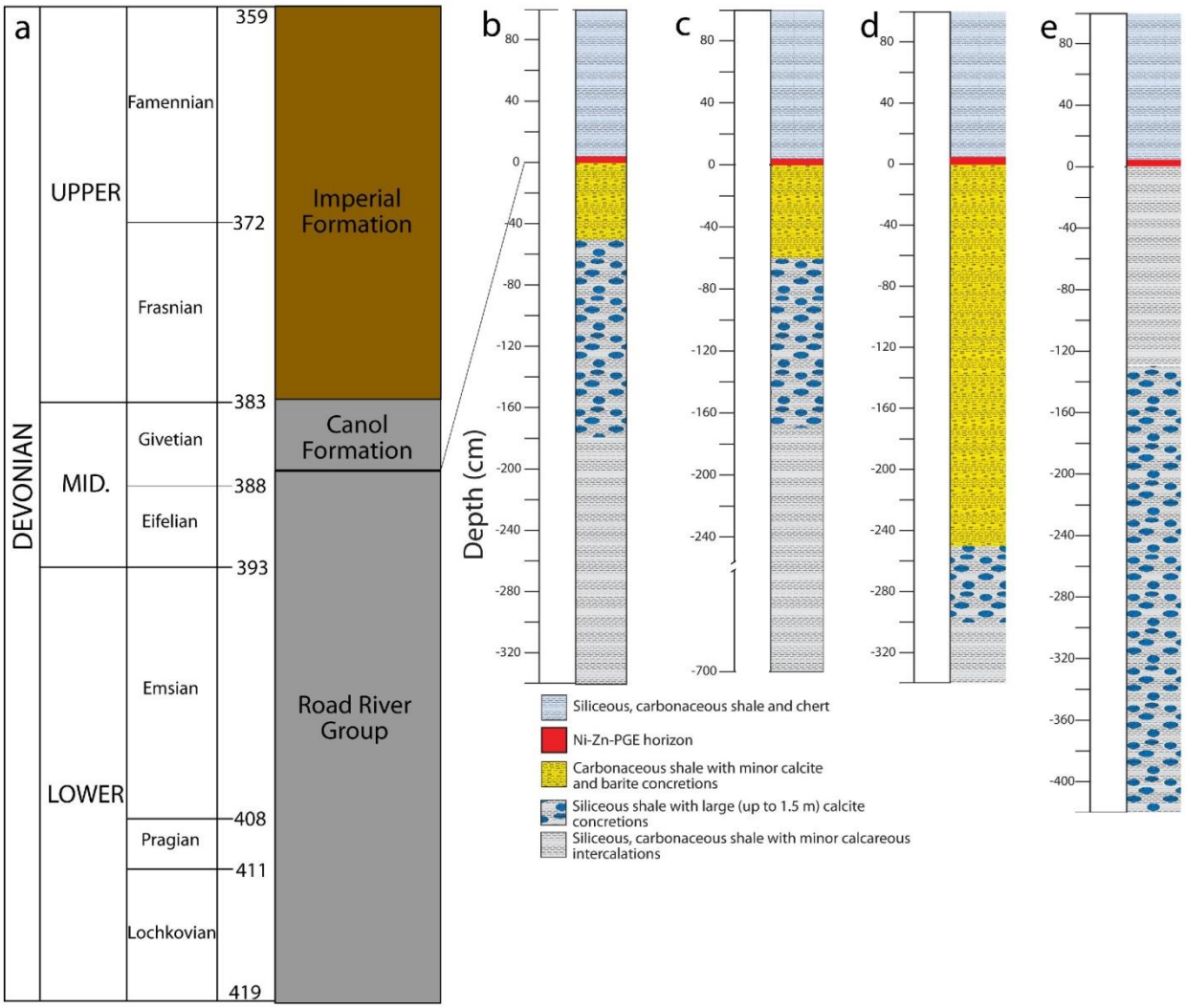


Figure 12. Devonian stratigraphy of Richardson trough in northern Yukon (a) with schematic stratigraphic sections that highlight the HEBS layer at: (b) Moss / Rich (Eagle Plains); (c) Peel River; (d) Monster River; and (e) Nick HEBS localities. From Gadd et al. (2018). Note that depth scales for detailed sections are in centimetres. See Figure 13 for section locations.

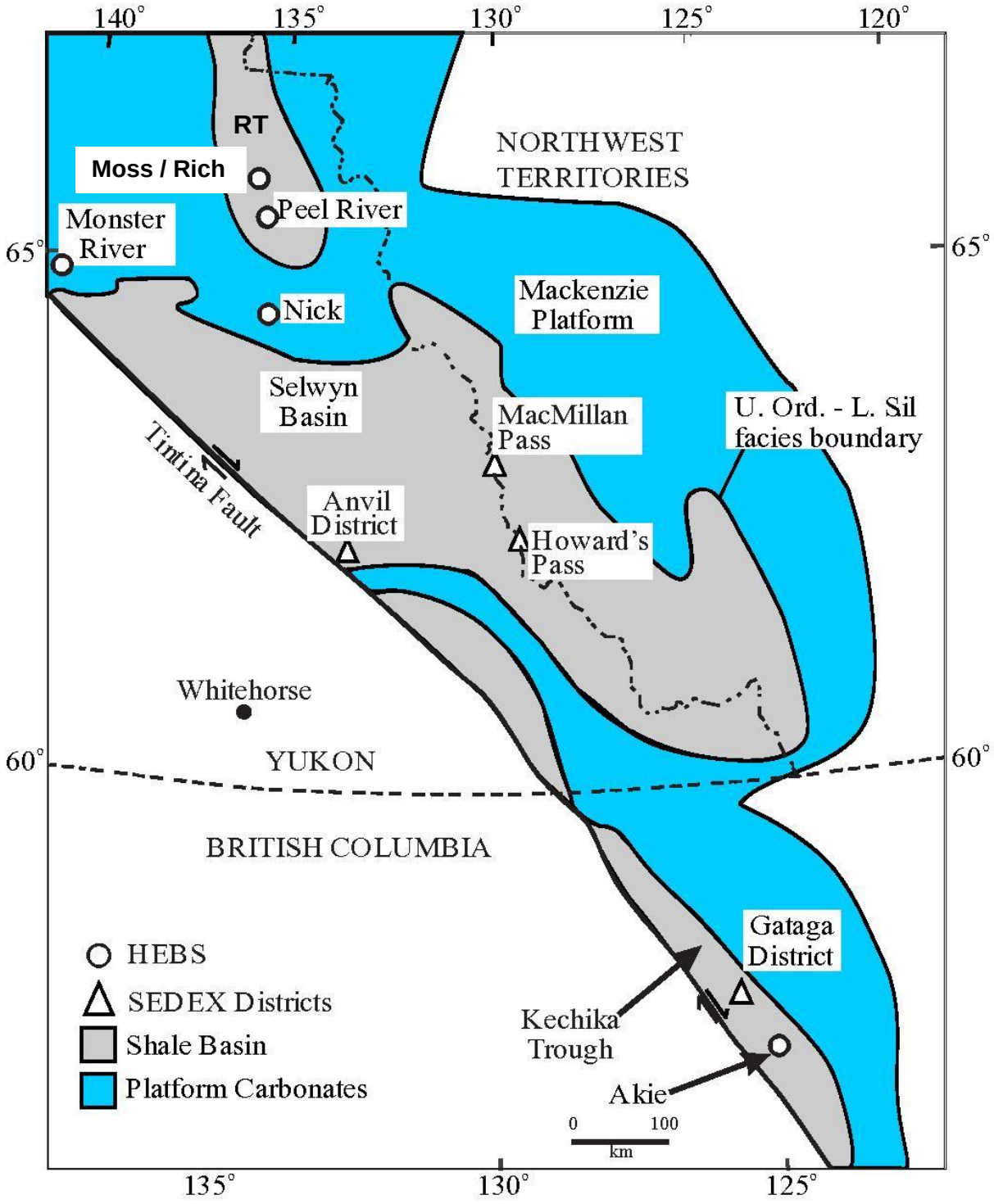


Figure 13. Map of ancestral North American passive continental margin displaying locations of HEBS occurrences and SEDEX districts (Gadd et al., 2018). RT = Richardson Trough. The WRM project areas lies north of the Moss / Rich HEBS occurrence.

Road River Group

The type section is located near 66°44'N and 135°46'W on a tributary of the Road River, which flows east into the Peel River on the east side of the Richardson Mountains. The base of the type section is faulted but thicknesses estimated nearby vary from 1677 to 2653 m. "Type section consists of a thick succession of alternating dark coloured graptolitic shales, argillaceous limestones and subordinate amounts of chert, dolomite, siltstone, and sandstone. This succession may be divided into a lower limestone and argillaceous limestone member, and an upper recessive shale, argillaceous limestone, shaly argillite, and chert member.… At the type location and throughout most of the Richardson Mountains, the Road River is unconformably overlain by Upper Devonian Canol Formation shale" (Hills et al., 1981).

"The uppermost Road River Group is latest Eifelian and older in age (≥387.7 Ma) and is primarily calcareous and dolomitic shale and mudstone, representing a slope environment below a carbonate platform that experienced cyclical turbidity current deposition" (Fraser and Hutchinson, 2017, p. 731).

Parts of NTS areas 106L and 116I, including the project area, were mapped by Cecile et al. (1982). They describe an unnamed unit immediately below the Canol Formation (i.e. the upper part of the Road River Group) as "graptolitic, black shale and shaly limestone; minor limestone, intraclast conglomerates and breccia. The upper 0-50 m is a white weathering, siliceous shale and chert; measured thicknesses 295 m … and 490 m" (Cecile et al. , 1982). Fraser et al. (2012) also noted that in the western Richardson Mountain the upper 50 m of the Road River Group is white weathering, siliceous shale and chert.

Road River Group – Canol Formation Contact (Hyper-Enriched Black Shale)

A thin (1 to 10 cm thick) Ni-Zn-PGE-rich hyper-enriched black shale (HEBS) layer at the Road River Group – Canol Formation contact is documented in many localities throughout northern Yukon (Figure 12). "The stratigraphy of each of the HEBS deposits is nearly identical. From the base upward …, a typical section comprises: 1) a 2 to 20 m thick carbonaceous shale with 1 to 1.5 m diameter calcareous concretions termed the "limestone ball member". Shale beds drape around concretions, and bedding is preserved within some concretions; 2) an up to 120 cm thick siliceous, carbonaceous shales with centimetre scale barite and calcite nodules; 3) a 1 to 10 cm thick stratabound, stratiform semi-massive Ni-Zn-Fe-sulphide HEBS layer; 4) carbonaceous, siliceous shale to black-cherty shale that is in sharp contact with the underlying HEBS mineralization" (Gadd et al., 2018, p. 194; Figures 12 and 13).

Canol Formation

Cecile et al. (1982) describe the Canol Formation as "whitish-grey weathering, jarositic, siliceous shale; chert, which, in the western map area, contains units of calcareous shale; contains lensoidal to ovoid metre-scale limestone nodules; measured thicknesses 410 m … and 235 m."

"The Canol Formation and time-equivalent strata represent the northernmost expression of a Devonian maximum sea-level transgression…. It is one of the source formations for the conventional oil reservoirs near Norman Wells, NWT" (Fraser and Hutchinson, 2017, p. 732). "The Canol Formation is confined to the latest Givetian to middle Frasnian stages (383.2–376.7 Ma) and consists of rhythmically bedded, biogenically sourced, siliceous shale and chert that was deposited in an anoxic (and likely euxinic) to oxic basin that evolved from moderately to strongly hydrographically restricted over time" (Fraser and Hutchinson, 2017, p. 731).

Imperial Formation

The Upper Devonian Imperial Formation … is a thick package of siliciclastic strata representing shelf, slope, and basin deposits derived from the Ellesmerian orogeny north of the study area…. In the western Richardson Mountains, the Imperial Formation consists of three lithologically different units: a lower rusty weathering, siliceous siltstone and shale with minor sandstone …, a middle unit dominated by siliceous siltstone, turbiditic sandstone and shale, and an upper portion of light grey weathering, laminated shale and siltstone with thin orange weathering pyritic sandstone beds. The lower portion has been dated in the study area as Frasnian to Famennian…. In the subsurface of Eagle Plain, the Imperial Formation attains a maximum thickness of 1229 m in well intersections" (Fraser et al., 2012, p, 49).

Road River Group and Canol Formation in the Richardson Mountains: Measured Sections

Trail River Section

Trail River Section − Geology

The Trail River section, measured by Fraser and Hutchinson (2017), lies on the west side of the Richardson Anticlinorium about 32 km southeast of the WRM project area. “Four distinct lithostratigraphic units were observed at Trail River that in stratigraphic order are assigned to the Road River Group (17.4 m), Road River – Canol contact zone (2.3 m), Canol Formation (227.3 m), and Imperial Formation (12.0 m)” (Fraser and Hutchinson, 2017; Figures 14a, 14b and 15).

Road River Group (upper part)

“Upper Road River Group strata consist of recessive dolomitic and calcareous shale (fissile) and mudstone (non-fissile), with 10% resistant bioclastic packstone beds and one 15 cm normally graded bed of chert-pebble conglomerate comprising rip-up clasts of chert fining upwards to fine-grained sandstone. Dolomitic and calcareous shale and mudstone are dark grey on fresh surfaces and weather grey-brown, and they are laminated and occur in beds ~2–10 cm thick…. Fine-grained pyrite, both disseminated and laminated, is present. Packstone beds range up to 28 cm in thickness, are medium grey in colour, and exhibit scoured lower and sharp upper contacts, with no obvious grading. Bioclasts include fragmented crinoids, brachiopods, and bivalves. The chert–pebble conglomerate consists of randomly oriented, matrix-supported, subangular, flat, and elongate pebbles (≤5 cm long and ≤2 cm wide) in a sandy matrix, with local dolostone cobbles…. The bed shows moderate to poor sorting and is normally graded. The uppermost 1.5 m of the Road River consists of bed-parallel, microcrystalline dolostone concretions up to 4.5 m long and 1 m thick. Internal planar lamination is preserved, and the concretions are surrounded by differentially compacted carbonates mudstone …. A possible 8 cm long nautiloid long-axis impression was observed in one concretion in addition to several 1 cm rounded cross-sections” (Fraser and Hutchinson, 2017, p. 735-736; Figure 15).

“Road River Group mudstone shows a predominance of dolomite (54%–59%), quartz (19%–35%), and calcite (4%–13%)” (Fraser and Hutchinson, 2017, p. 741).

Canol Formation

“The Canol Formation on Trail River is characterized by rhythmically bedded siliceous shale and chert comprising three lithofacies: siliceous shale, interbedded siliceous shale and chert (with variable

percentages of each greater than 10%), and chert …. All lithofacies are characterized by disseminated and framboidal pyrite and concretionary carbonate and pyrite. The exposure is resistant, forming a canyon in the river valley and is highly fractured, with three dominant joint-sets occurring at high-angles to bedding" (Fraser and Hutchinson, 2017, p. 736-738; Figure 15).

Canol Formation Lithofacies 1: Siliceous Shale:

> Siliceous shale is black on fresh surfaces and weathers dark grey to black and olive grey, often with a distinctive yellow–grey–green weathering residue. The shale is fissile, cleaving into sheets dependent on laminae thickness…. Laminae are planar and contacts are sharp. Two variants of this lithofacies are (i) thicker-bedded units, with beds up to 10 cm thick, which require a hammer to break; and (ii) recessive, finely laminated units, composed of beds up to 3 cm thick that are softer, easy to break with the hand, and locally weather to a soft clay-consistency (also referred to as wafery shale). This lithofacies includes up to 10% chert beds. The high silica content of these shales was indicated in the field by the "broken glass" sound when walking on scree piles. Siliceous shale is more dominant than chert in the upper half of the Canol Formation (above 146 m measured depth)" (Fraser and Hutchinson, 2017, p. 738).

Canol Formation Lithofacies 2: Chert

> Chert is black on fresh surfaces and weathers dark to medium grey to black. Unlike the fissility of the shale, the chert exhibits conchoidal fracture and is very difficult to break with a hammer …. Laminations (millimetre-scale) can be observed on weathered surfaces; however, the chert will only separate along certain bedding planes. Bed thicknesses are commonly 1–10 cm, but they may be as thick as 16 cm. This unit may include up to 10% siliceous shale partings in intervals <5 cm thick. Chert dominates the lower half of the Canol Formation, below 146 m measured depth" (Fraser and Hutchinson, 2017, p. 738).

Canol Formation Lithofacies 3: Interbedded Siliceous Shale and Chert

> This facies comprises interbedded siliceous shale and chert end-members described above, with variations in proportions of each greater than 10%. It is more common in the upper half of the measured section, above 126 m measured depth" (Fraser and Hutchinson, 2017, p. 738).

Analyses of Canol Formation samples "… indicate 92%–100% quartz with lesser muscovite (≤4%), jarosite and pyrite (≤4%), and barite and gypsum (≤1%). The only exception is the very basal Canol Formation sample at 19.7–20.0 m, which contains less quartz than the rest of the formation (79%) and more muscovite (11%) and pyrite (6%)" (Fraser and Hutchinson, 2017, p. 741).

Trail River Section − Geochemistry

Nickel–Molybdenum Suite: The NiMo horizon does not occur at the Trail River section. Maximum values within the 2.3 m thick Road River – Canol transition zone (RCTZ) include 213 ppm Ni, 43 ppm Mo and 403 ppm Zn (Fraser and Hutchinson, 2017). Twelve of the 13 samples from this interval contain only modest S values (1.89% to 6.96% S). However, one near the middle of the RCTZ (sample 14-TF-

001 18.2 m) returned 29.57% S and 38.4% Fe_2O_3 but only 67.7 ppm Ni and 5.7 ppm Mo (Fraser and Hutchinson, 2017).

Vanadium: The maximum vanadium values obtained from the systematic sampling of the Trail River section were 88 ppm V in the upper Road River Group (10 samples), 453 ppm V in the Road River – Canol transition zone (13 samples), 1444 ppm V in the Canol Formation (117 samples), and 266 ppm V in the lower Imperial Formation (7 samples). A plot of V versus stratigraphic height for the Trail River samples is presented in Figure 16 (along with U and Mo). Note the overall enrichment of V in the lower part of the Canol Formation (lithochemozones C and D) particularly over the interval from 58 to 130 m, which has an average of 884 ppm V (0.16% V_2O_5) over 72 m including an average of 1112 ppm V (0.20% V_2O_5) over 14 m from 76 to 90 m (Fraser and Hutchinson, 2017).

Silicon: "The very high SiO_2 composition (average 83%) of the Canol Formation is supported both by facies interpretations (dominance of chert and siliceous shale) and by XRD results where quartz averages 96% …. A biogenic silica source for the Canol Formation is inferred based on a negative correlation between SiO2 versus Zr ….. The biogenic source is likely the hemipelagic production of radiolarian tests and lesser sponge spicules (observed in biostratigraphic samples) that either rained out onto the seafloor or were dissolved in the water column and then reprecipitated as silica cement in the ocean floor" (Fraser and Hutchinson, 2017, p. 751).

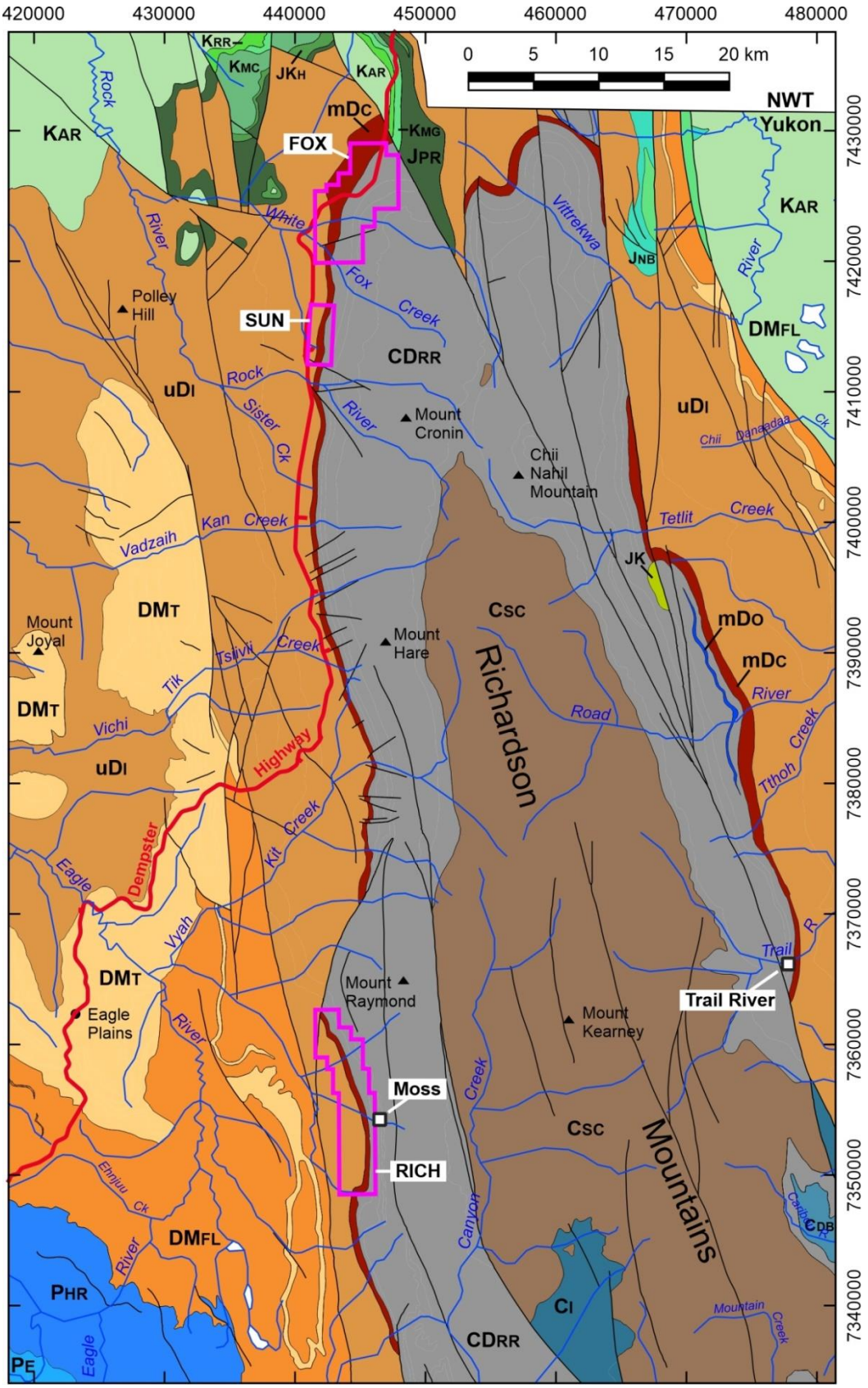


Figure 14a. WRM project area geology map (Cecile et al., 1983; Yukon Geological Survey, 2018) showing locations of measured sections (Trail River, Moss) and former mineral properties (FOX, SUN, RICH). See Figure 14b for legend.

Lower Cretaceous

- KAR — Arctic Red Formation: dark grey to brown or black shale and interbeds of siltstone
- KRR — Rat River Formation: interbedded units of sandstone and shale
- KMG — Mount Goodenough Formation: sandstone, siltstone, shale and local conglomerate
- KMC — Martin Creek Formation: fine-grained quartz arenite

Upper Jurassic – Lower Cretaceous

- JK — Unnamed unit: undivided shale, siltstone, sandstone, minor conglomerate
- JKH — Husky Formation: dark grey shale, siltstone and ironstone

Middle – Upper Jurassic

- JPR — Porcupine River Formation: siltstone and light grey fine to very fine-grained sandstone
- JNB — North Branch Formation: light grey glauconitic conglomeratic sandstone, shale and siltstone

Pennsylvanian

- PE — Ettrain Formation: fossiliferous limestone and glauconitic sandy carbonate
- PHR — Hart River Formation: thinly laminated, cherty spiculite and spicule lime packstone

Upper Devonian – Mississippian

- DMFL — Ford Lake Formation: pyritic shale, siltstone, lesser sandstone, conglomerate and silty limestone
- DMT — Tuttle Formation: chert granule to pebble conglomerate, sandstone, interbedded sandstone and shale

Upper Devonian

- uDI — Imperial Formation: dark grey shale and siltstone, lithic sandstone

Middle Devonian

- mDC — Canol Formation: dark grey to black non-calcareous shale
- mDO — Ogilvie Formation: dark grey and black, fine-grained limestone

Cambrian – Middle Devonian

- CDRR — Road River Group: graptolitic black shale, calcareous shale, shaly limestone, limestone, minor chert
- CDB — Bouvette Formation: grey and buff-weathering dolostone and limestone

Cambrian

- CSC — Slats Creek Formation: turbiditic, quartz sandstone with minor shale and siltstone
- CI — Illtyd Formation: fine crystalline, dark grey limestone

- Outline of former mineral property (quartz claims)
- Measured section

Figure 14b. Geological legend for Figure 14a.

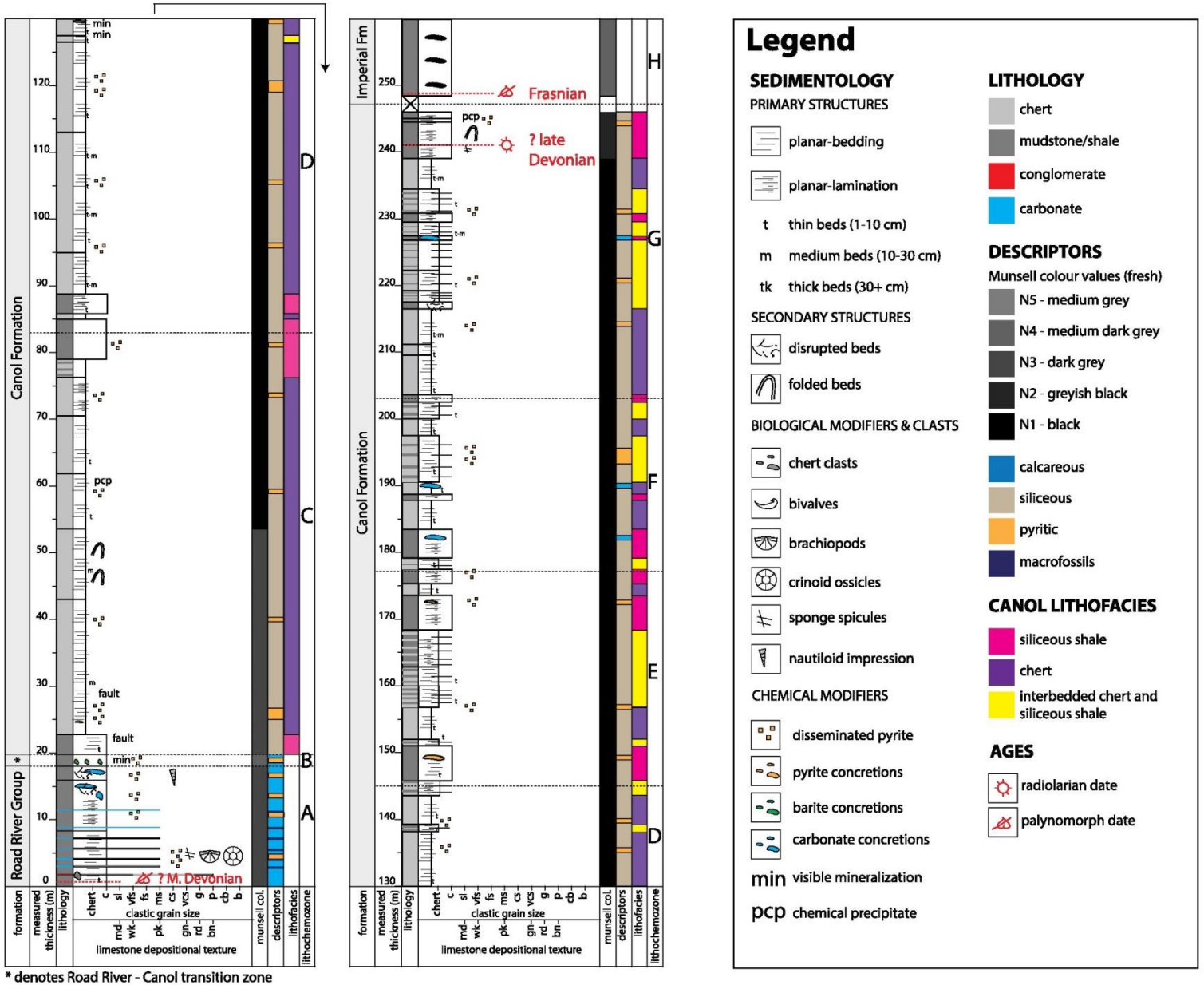


Figure 15. Composite sedimentary and lithofacies log of the Canol Formation measured section Trail River. From Fraser and Hutchinson (2017).

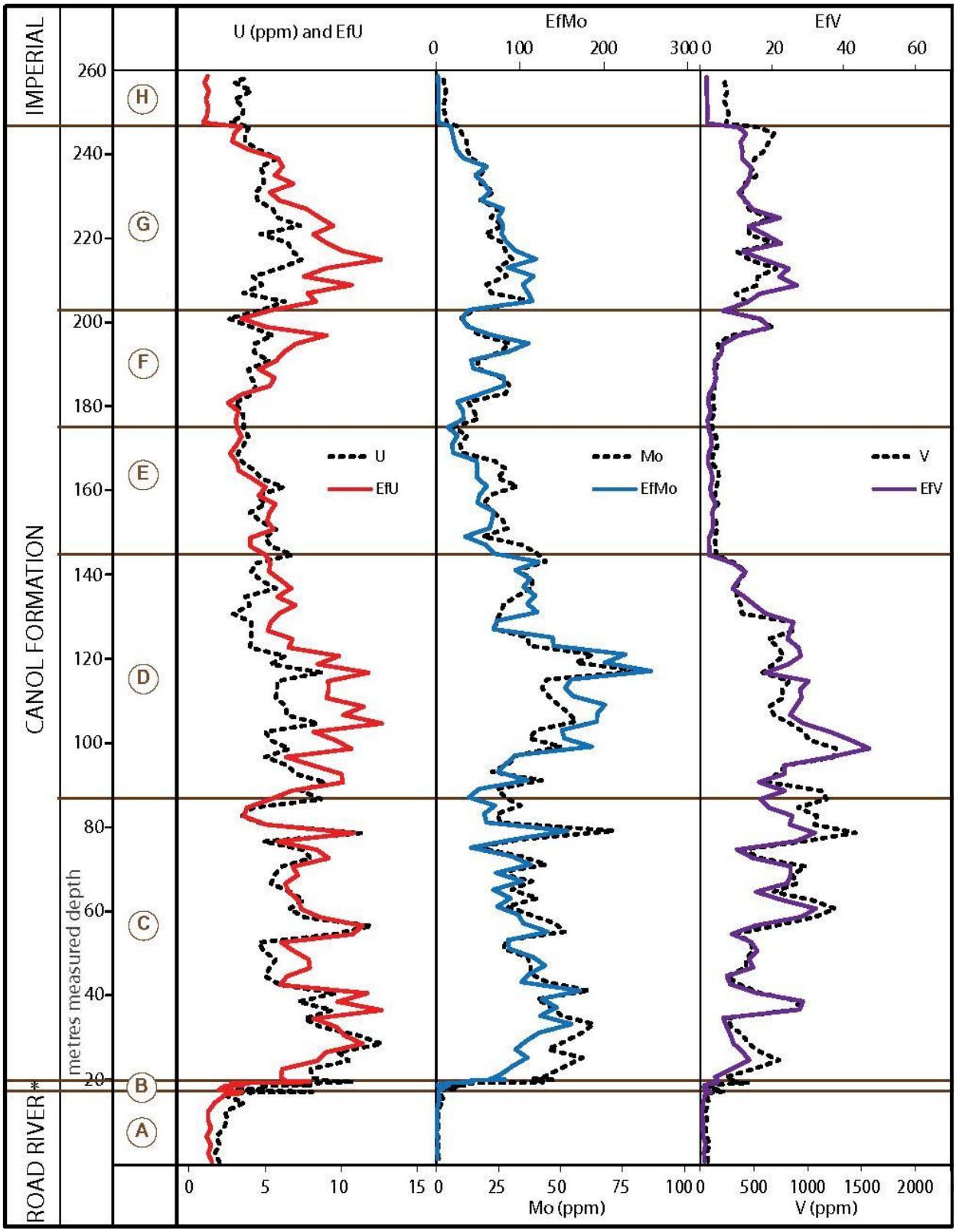


Figure 16. Trail River section U, Mo and V profiles (from Fraser and Hutchinson, 2017). Note that ppm values are displayed by black, dashed lines. See Fraser and Hutchinson (2017) for a definition of "Ef" values.

Moss Section

Moss Section – Geology

The Moss section, which includes a hyper-enriched black shale (HEBS) showing, is located in outcrop at 66°18'13"N, 136°11'36"W (Figures 14a, 14b and 17). This is near the HEBS (NiMo horizon) drill core intersections reported by Dumala (2007c) on the former Rich property (the Nickelrich occurrence (occurrence number 116I 085) of the Yukon Geological Survey) about 27 km south of the WRM project area. The 22 m of exposed strata at the Moss section "… comprises the following (from the base to the top): 1) Carbonaceous and siliceous shale with minor calcareous and pyritic intercalations. The rocks consist of several fining-upward sequences with minor scoured surfaces …. The bottom of the section is not constrained at the Moss showing. 2) Carbonaceous shale (1 to 2 m thick) with 0.5 to 1.5 m diameter elongated calcareous concretions. Shale beds drape around concretions … bedding is preserved within some concretions that conform to surrounding shale laminae. 3) Up to 120 cm thick siliceous, carbonaceous shales with centimetre scale, spheroidal barite and carbonate nodules. 4) A 1 to 4 cm thick stratabound, stratiform semi-massive sulphide HEBS layer…. 5) Carbonaceous, siliceous shale to cherty shale that is in sharp contact with the underlying HEBS mineralization" (Gadd et al., 2019, p. 166). Figure 17 displays the Moss measured section and accompanying photographs.

Moss Section – Geochemistry

Nickel–Molydenum Suite: Five samples from the 1 to 4 cm thick, hyper-enriched black shale (HEBS) layer returned 22.80 to 40.21% Fe_2O_3 (total Fe), 23.7–39.5% S, 3.11–4.10% Ni, 320–1720 ppm Zn, 2863–5500 ppm As, 1760–2460 ppm Se, 2370–2980 ppm Mo, 2060–2410 ppm Hg, 2.07–2.25 ppm Ag, 67–167 ppb Au, 255–368 ppb Pt and 154–228 ppb Pd (Gadd et al., 2019; Gadd pers. comm., 2020).

Vanadium: The HEBS samples returned 5 to 304 ppm V and 12 samples from the lower 1.5 m of the Canol Formation returned 123 to 434 ppm V. Samples from the upper 2.85 m of the Road River Group returned 184 to 1787 ppm V with 8 of the 19 samples containing ≥ 1000 ppm V. The three lowest samples of the Road River Group in the measured section, from 2.05 to 2.85 m below the Road River–Canol contact, average 1367 ppm V (0.24% V_2O_5) over 0.80 m (Gadd et al., 2019; Gadd pers. comm., 2020).

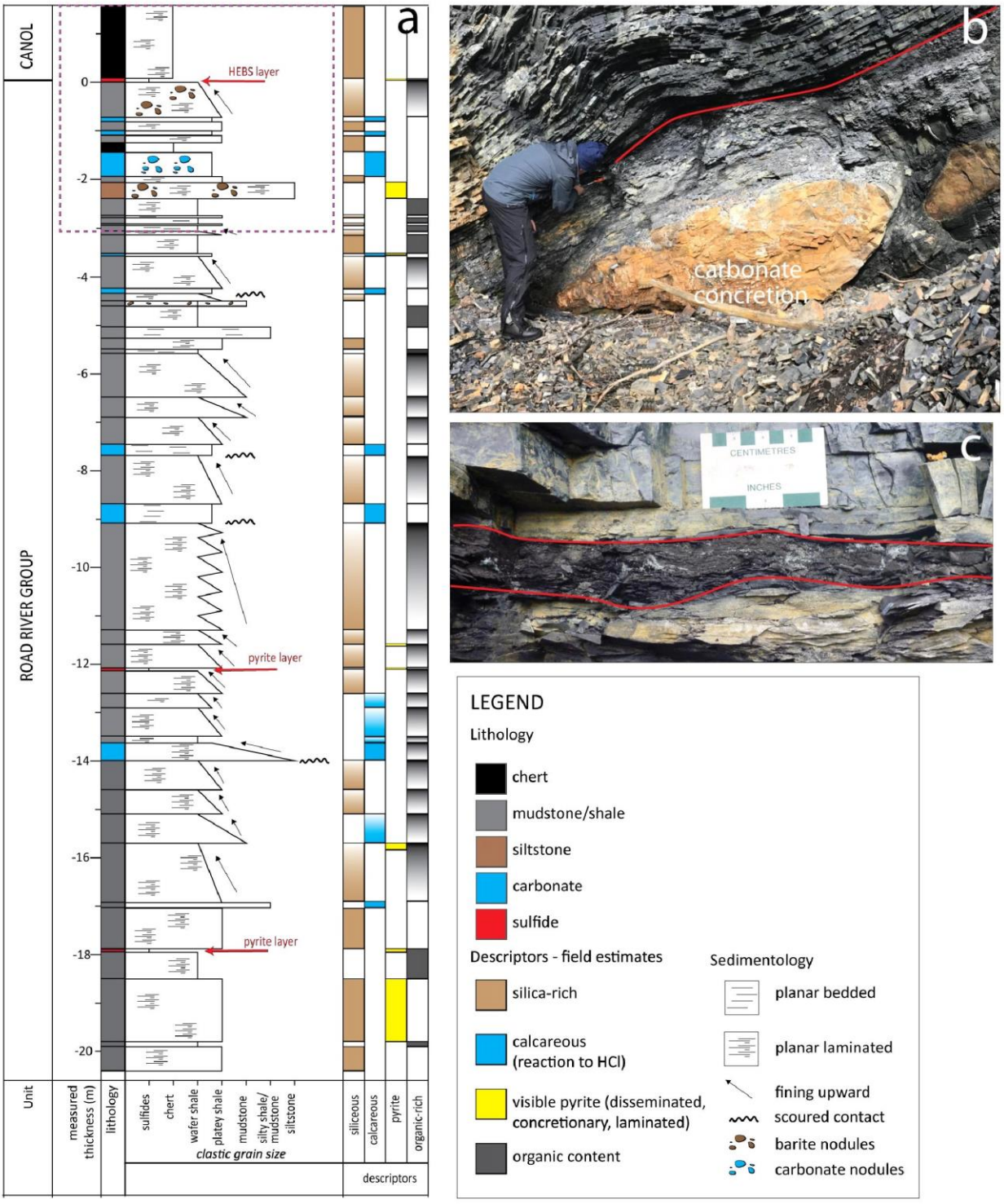


Figure 17. a) Schematic sketch of the stratigraphic succession at the Moss locality showing lithological descriptors and sedimentary features (Gadd et al., 2019). The '0 m' stratigraphic marker defines the HEBS mineralized zone. b) Photograph of the upper portion of the stratigraphic succession at Moss showing a large carbonate concretion and its relationship to the overlying HEBS layer (red line). c) Close-up photograph of the HEBS layer at the Moss showing (outlined by red lines).

Sulphide Hosted Nickel-Molybdenum and Shale Hosted Vanadium in the Western Richardson Mountains: Data from Previous Exploration

Rich Property

Rich Property – Geology

The hyper-enriched black shale (also referred to as the NiMo horizon) was observed in drill core from several holes drilled in 2007 on the former Rich property, about 20 km south of the WRM project area (Dumala, 2007c; Figure 14a). A generalized stratigraphic column that accompanied the Dumala (2007c) report is presented in Figure 18.

Road River Group

> "The Road River Group comprises calcareous, finely laminar, evenly bedded, black shale that is distinguished from shale belong to the Canol Formation by its vigorous reaction with dilute hydrochloric acid. Distinctive brecciated limestone balls commonly occur within one to three metres of the Canol-Road River contact. Lower in the formation, crinoid stem fragments are often found within limestone beds, which exhibit a grainstone texture. The Road River Group also contains finely laminar, fine-grained sulphides (dominantly pyrite) in bands, lenses and beds and in disseminated form" (Dumala, 2007c, p.7).

NiMo Horizon (Hyper-Enriched Black Shale)

> "The NiMo horizon consists of very fine-grained, bronze-to-gold, sulphide-rich laminae. Individual laminae range in thickness from < 1 mm up to about 2 mm. They are wavy and commonly exhibit a pinch-and-swell texture. Mild to moderate bioturbation and physical disruption of individual laminae is characteristic of the horizon. Out of the 14 holes that intersected the Canol–Road River contact, only four did not intersect visible NiMo mineralization. Two of these four holes (RI07-14A and RI07-14B) had poor recovery in the contact zone. The other two holes (RI07-19 and -20) intersected sulphide mineralization near the predicted intersection of the contact; however, samples collected from these intervals returned only weak to moderate values of NiMo indicator elements. The thickness of the NiMo horizon ranges from approximately 1 cm to 196 cm (RI07-08). Excluding the interval in RI07-08 the individual layers of NiMo mineralization averaged 3.5 cm. The NiMo horizon in hole RI07-08 displays signs of soft sediment deformation, while the sediments above and below the horizon appear undeformed" (Dumala, 2007c, p.7).

Canol Formation

> "The Canol Formation shale is black, non-calcareous, and finely laminar. It is slightly to moderately weathered, fissile and somewhat friable. Barite rich nodules, phosphate rich nodules, cherty layers, micrite and carbonate laminae/beds are also present towards the lower contact. The Canol Formation also exhibits rare to common, thinly bedded, sulphide rich laminae and lenses, as well as uncommon to common, finely laminar, non-fossiliferous, grey to black micritic limestone beds up to several centimetres thick …. Except for their varying carbonate content, the Canol Formation and Road River Group are mineralogically similar." (Dumala, 2007c, p.7).

Rich Property − Rock Geochemistry

Nickel–Molydenum Suite in Outcrop: During 2007, 15 chip samples were collected on the former Rich property from the Road River – Canol contact area along four different canyons. Three samples were collected from the NiMo horizon (C38516, C385617 and C385636) and these samples returned high values for Ni, Mo and other elements (Table 1; Dumala, 2007c). Interestingly, some samples that were not collected from the NiMo horizon returned significantly elevated values of Ni and Mo (e.g. sample C385623: 7410 ppm Ni, 783 ppm Mo and 4500 ppm Zn over 21 cm's and sample C385620: 4350 ppm Ni, 410 ppm Mo, 5340 ppm Zn over 15 cm). Also note the high Au, Pt, Pd and Re values in samples C358624 and C358626 despite their modest Ni and Mo contents (these samples were described as "potential" or "weathered" NiMo horizon).

Sample	Int.	Ni	Mo	Zn	Au	Pt	Pd	Re	Ag	As	Se	Tl
	(cm)	(ppm)	(ppm)	(ppm)	(ppb)	(ppb)	(ppb)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
C385613	3.5	124.5	168.5	38	165	322	214	31.8	2.27	90.7	162	25.80
C385616*	**5**	**4.78%**	**2380**	**6170**	**120**	**315**	**196**	**38.4**	**2.33**	**4310**	**2580**	**257.00**
C385617*	**1.5**	**1.29%**	**2530**	**189**	**356**	**464**	**296**	**49.9**	**4.12**	**4390**	**5990**	**213.00**
C385619	1.5	1010	374	2930	27	33	25	3.700	4.79	891	225	14.50
C385620	15	4350	410	5340	18	33	28	4.210	4.47	876	358	20.30
C385621	14	457	28.6	637	3	10	4	0.641	0.29	38	44	2.14
C385622	9	1585	80.6	2130	4	11	4	0.900	0.74	119	70	4.48
C385623	21	7410	783	4500	21	76	37	7.720	4.81	1520	565	36.10
C385624	1.5	198	112	181	256	449	296	48.8	3.6	56	300	14.90
C385625	28	62.1	161.5	27	7	11	3	0.692	0.82	47.8	92	52.60
C385626	0.5	679	349	193	468	638	391	>50	3.96	131	361	62.70
C385634	7	45.3	41.6	87	<1	<5	1	0.049	0.40	31.3	10	4.81
C385635	30	339	22.3	564	<1	<5	2	0.017	0.25	22.9	10	2.62
C385636*	**8**	**4.16%**	**2690**	**299**	**241**	**470**	**282**	**>50**	**3.23**	**3820**	**4680**	**248.00**
C385637	28	406	116	23	5	5	6	0.737	0.36	157	131	33.70

Table 1. Results of 2007 chip sampling program on the former Rich property (Dumala, 2007c). *Samples C38516, C385617 and C385636 are from the NiMo horizon and samples C385619, C358624 and C358626 were described as "potential" or "weathered" NiMo horizon).

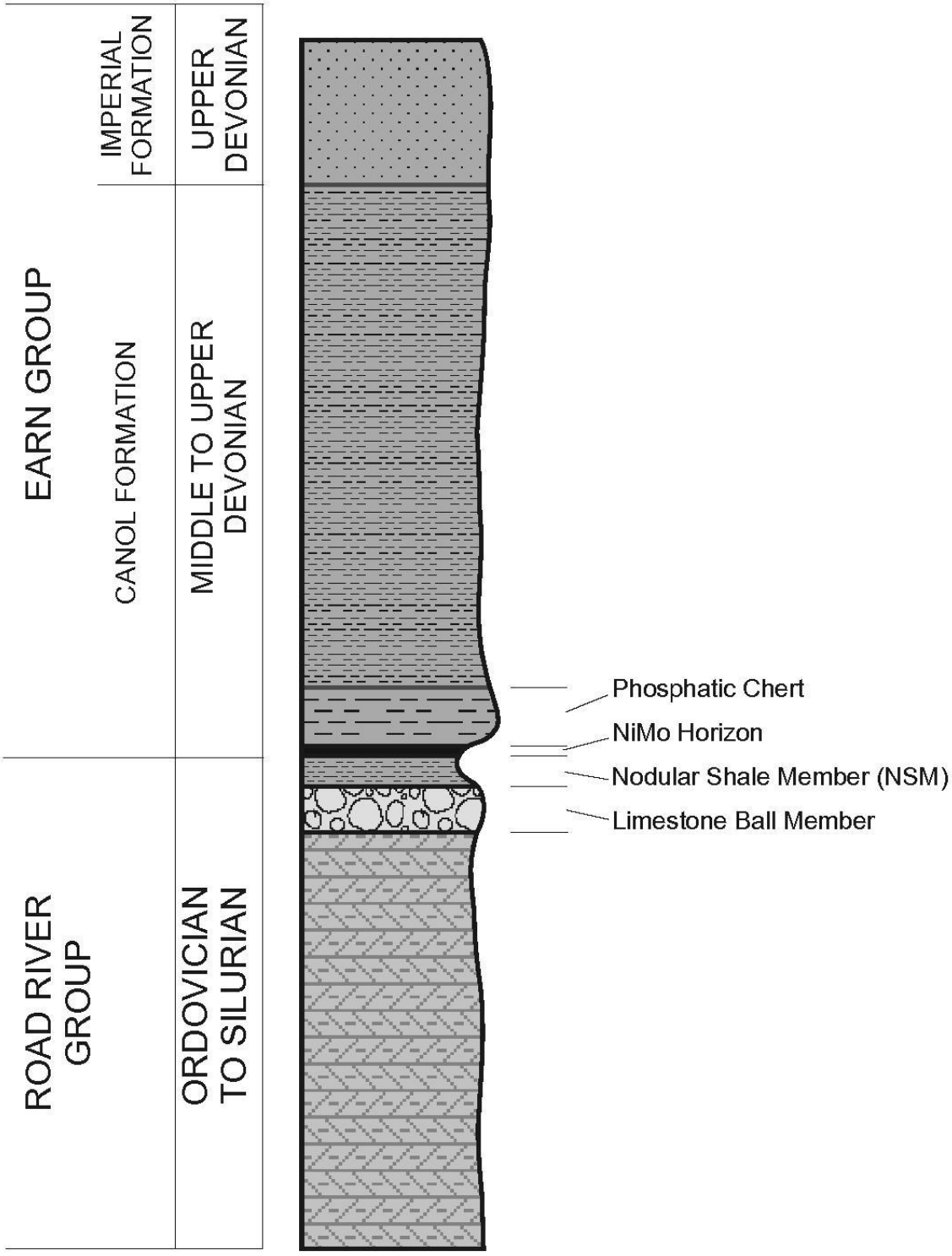


Figure 18. Generalized stratigraphic column from Rich Property 2007 drilling report (Dumala, 2007c).

Vanadium in Outcrop: Three of the 15 outcrop chip samples returned >2000 ppm V: 2540 ppm V in sample C385619; 2600 ppm V in sample C385620 and 2040 ppm V in sample C385625 (Dumala, 2007c; Table 2).

Sample	Int. (cm)	V (ppm)	V_2O_5 (%)	Description
C385619	1.5	2540	0.45	rusty layer, black to dark grey shale, possible NiMo horizon; 2.66% S, 2.65% Fe, 2930 ppm Zn, 1010 ppm Ni, 374 ppm Mo; 4.79 ppm Ag
C385620	15	2600	0.46	black, very calcareous, sooty shale with botryoidal carbonate encrustation; reacts strongly with HCl; 3.84% S, 2.30% Fe, 5340 ppm Zn, 4350 ppm Ni, 410 ppm Mo, 4.47 ppm Ag
C385625	28	2040	0.36	fissile, black shale with 1 cm x 3 cm chert? nodules; no reaction with HCl; yellow (oxidation products?); weathers light grey; 1.08% S, 1.82% Fe, 27 ppm Zn, 62.1 ppm Ni, 161.5 ppm Mo, 0.82 ppm Ag

Table 2. Vanadium results of >2000 ppm from 2007 chip sampling on the former Rich property (Dumala, 2007c).

Nickel–Molydenum Suite in Drill Core: During 2007, 25 holes were drilled on the former Rich property targeting the NiMo horizon over a strike length of 7 km. Significant assay results for samples from the NiMo horizon are summarized in Table 3. "The NiMo horizon shows an elevated concentrations of nickel, molybdenum, zinc, gold, platinum, palladium, rhenium, arsenic, antimony, cobalt, copper, germanium, indium, phosphorous, selenium, tellurium, thallium and uranium relative to the wallrocks" (Dumala, 2007c, p.8). Samples of wall rock up to 14 m above and 20 m below the NiMo mineralization generally returned low metal values.

Hole	From (m)	To (m)	Int. (m)	Ni (%)	Mo (ppm)	Zn (%)	Au (ppb)	Pt (ppb)	Pd (ppb)	Re (ppm)	Se (ppm)	Ag (ppm)
R107-05	152.56	152.58	0.02	3.90	714	4.25	70	184	156	9.35	1225	1.86
R107-06	52.37	52.38	0.01	3.30	1000	0.38	234	315	412	10.10	NA	NA
R107-06	58.62	58.66	0.04	3.91	1250	2.36	96	196	142	13.00	NA	NA
R107-07	158.64	158.67	0.03	3.60	2500	0.46	97	207	128	29.60	NA	NA
R107-08*	62.22	64.18	1.96	1.31	1189	0.10	46	92	41	9.68	476	0.46
R107-10	65.82	65.88	0.06	2.64	1350	0.59	245	148	109	8.80	NA	NA
R107-12	82.72	82.74	0.02	3.04	1270	0.32	101	186	102	15.95	NA	NA
R107-12	83.12	83.17	0.05	1.78	930	0.98	71	75	75	12.35	NA	NA
R107-15	101.50	101.53	0.03	2.66	2820	0.38	100	174	98	17.35	>1000	1.92
R107-16	91.90	91.91	0.01	4.56	2790	1.05	158	225	152	38.50	>1000	3.85
R107-17	96.74	96.75	0.01	7.04	2460	1.54	89	254	158	38.60	>1000	2.14
R107-18	70.68	70.73	0.05	4.30	1720	0.72	79	194	125	29.60	1265	2.06
R107-19	80.59	80.62	0.03	0.65	237	0.29	17	50	19	3.12	250	0.50
R107-20	74.42	74.51	0.09	0.080	129.5	0.04	17	5	6	0.47	20	0.34

Table 3. Significant diamond drill intersections on former Rich property (Dumala, 2007c). *The values for hole RI07-08 are the weighted averages of 20 samples.

"Individual samples collected from within the 1.96 m thick NiMo horizon in RI07-08 show a considerable variation of metal values. These variations in metal content suggest that this intersection crosses the horizon, instead of running along it. The samples collected near the top and bottom of the interval are more enriched in most elements, implying a possible second pulse of mineralization. The material between these two enriched layers is more diluted with sediments and shows signs of soft sediment deformation" (Dumala, 2007c, p.8). Individual sample results for the NiMo horizon in RI07-08 are summarized in Table 4.

From (m)	To (m)	Int. (cm)	Ni (%)	Mo (ppm)	Zn (%)	Au (ppb)	Pt (ppb)	Pd (ppb)	Re (ppm)	Se (ppm)	Ag (ppm)
62.22	62.22	<1	1.14	766	0.68	331	169	78	1.72	>1000	1.69
62.22	62.29	7	0.47	125.5	0.18	32	58	23	2.11	214	0.32
62.29	62.39	10	1.85	468	0.15	68	129	56	9.20	590	0.74
62.39	62.50	11	2.10	550	0.14	65	152	61	10.15	585	0.76
62.50	62.61	11	1.37	386	0.08	46	113	42	7.81	401	0.42
62.61	62.71	10	1.72	472	0.08	54	122	48	10.50	500	0.52
62.71	62.76	5	1.66	467	0.08	46	114	45	10.25	484	0.51
62.76	62.90	14	0.86	288	0.05	21	45	16	5.76	271	0.29
62.90	63.03	13	0.25	118.5	0.02	14	11	11	2.08	103	0.16
63.03	63.20	17	1.53	398	0.08	37	130	49	10.70	486	0.40
63.20	63.31	11	1.37	434	0.07	70	104	40	11.20	504	0.38
63.31	63.41	10	1.06	511	0.05	75	88	37	9.03	486	0.43
63.41	63.58	17	1.27	377	0.06	61	99	40	11.10	513	0.36
63.58	63.74	16	1.03	324	0.05	50	74	37	9.33	431	0.34
63.74	63.85	11	1.15	270	0.05	33	62	39	12.10	502	0.32
63.85	63.95	10	0.73	187.5	0.04	15	46	25	8.10	328	0.27
63.95	64.00	5	1.89	498	0.13	41	119	72	18.95	899	0.78
64.00	64.08	8	2.85	713	0.25	61	169	105	23.10	>1000	1.14
64.08	64.11	3	1.89	1055	0.99	NA	NA	NA	13.75	960	0.95
64.11	64.18	7	1.12	501	0.25	32	76	37	9.37	539	0.57

Table 4. Results for samples from drill hole RI07-08 NiMo horizon intersection on the former Rich property (Dumala, 2007c).

Vanadium in Drill Core: Hole RI07-18 returned 2030 ppm V (0.36% V_2O_5) from 70.37 to 70.99 m (0.62 m core interval; sample C488361). This sample was collected from finely laminar non-calcareous black shale of the Road River Group immediately below the NiMo horizon. Other analytical values include 5.33% S, 4.93% Fe, 848 ppm Zn, 358 ppm Ni, 100.5 ppm Mo and 0.82 ppm Ag.

Sun Property

Sun Property – Geology

Three diamond drill holes (SN07-01 to SN07-03) were drilled in 1997 on the former Sun property near the WRM project area (Dumala, 2007b; Figure 19). The hyper-enriched black shale (NiMo horizon) was only intersected in hole SN07-03.

"Diamond drilling intersected shales belonging to the Canol Formation and Road River Group in holes SN07-02 and -03, but hole SN07-01 recovered only Road River strata, which put it too deep in section to intersect the NiMo horizon …. Hole SN07-02 intersected the contact area within a heavily weathered interval near surface so that the NiMo horizon may have been leached out" (Dumala, 2007b, p. 5).

Sun Property – Rock Geochemistry

Nickel–Molydenum Suite in Drill Core: "The NiMo intersection from SN07-03 returned 3.01% nickel, 1170 ppm molybdenum, 6300 ppm zinc, 65 ppb gold, 171 ppb platinum, 97 ppb palladium, 19.3 ppm rhenium and 2.5 ppm silver over 1 cm. A sample collected 4.89 m above that sample graded 2570 ppm nickel, 13.75 ppm molybdenum, 8320 ppm zinc and 80.6 ppm uranium over 4 cm" (Dumala, 2007b, p. 5). A summary of Ni, Zn, Mo and V values obtained from drill core from the former Sun and Fox properties is presented in Table 5.

Vanadium in Drill Core

The NiMo horizon intersected in hole SN07-03 returned only 365 ppm V (from 86.64 to 86.65 m). Continuous core samples collected from hanging wall and footwall strata between 77.73 m and 90.15 m returned V values of 114 ppm to 767 ppm V (Dumala, 2007b).

In hole SN07-01, which was drilled entirely within overburden and the Road River Group, continuous core sampling between 62.63 m and 66.30 m (7 samples over a core length of 3.67 m) returned up to 258 ppm Ni, 3490 ppm Zn, 71.1 ppm Mo and 2970 ppm V. The weighted average V value over the 3.67 m core interval is 2267 ppm V (0.40% V_2O_5; Table 6). The core is described as very fine grained, calcareous and carbonaceous shale that is mainly black with some medium and dark grey horizons. Some thin lenses of pyrite were noted as well as a 2 cm thick sulphide horizon from 64.45–64.47 m. From surface to 14.1 m hole SN07-01 was drilled in overburden so the sampled V rich interval (starting at 62.63 m) occurs at least 49 m down hole from the NiMo horizon (Dumala, 2007b). The samples from 62.63 m and 66.30 m are the shallowest samples from the hole. The only other drill core samples from this hole of were

collected between 95.96 and 97.73 m. The lowermost sample (G0870102) returned 1450 ppm V over 0.5 m.

In hole SN07-02 the Road River Group – Canol Formation contact is placed at 33.34 m although the NiMo horizon was not observed. Continuous core sampling from 32.18 m to 37.50 m (7 samples over a core length of 5.32 m) returned maximum values of 396 ppm Ni, 2610 ppm Zn, 93.8 ppm Mo and 3080 ppm V. The weighted average V value over the 5.32 m core interval is 2609 ppm V (0.47% V_2O_5). The drill core is described as fine grained, black to dark grey shale with 2-10 cm thick carbonate horizons. This was the only core sampled from this hole (Dumala, 2007b).

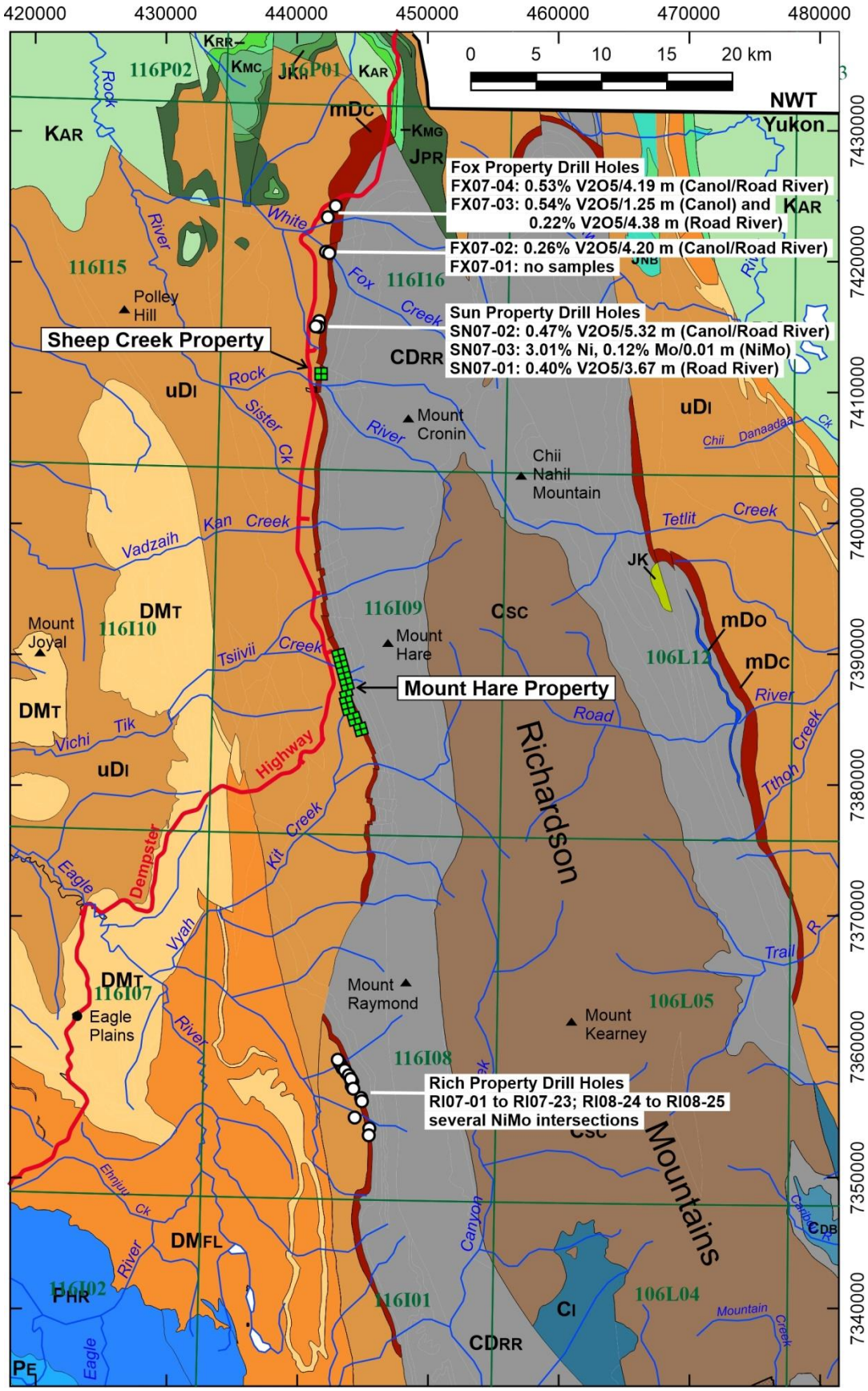


Figure 19. WRM project area geology map showing locations of 2007 and 2008 drill holes (and intersections). See Figure 14b for legend.

Property	Hole	Unit	From (m)	To (m)	Sample Interval (m)	Sample	Ni (ppm)	Zn (ppm)	Mo (ppm)	V (ppm)
SUN	SN07-01	Road River	62.63	63.63	1.00	G087001	235	2520	48.40	2500
SUN	SN07-01	Road River	63.63	64.13	0.50	G087002	258	3270	56.90	2970
SUN	SN07-01	Road River	64.13	64.43	0.30	G087003	242	3490	71.10	2790
SUN	SN07-01	Road River	64.43	64.50	0.07	G087004	219	1090	49.80	2130
SUN	SN07-01	Road River	64.50	64.80	0.30	G087005	219	1615	68.30	2100
SUN	SN07-01	Road River	64.80	65.30	0.50	G087006	205	1030	53.80	1960
SUN	SN07-01	Road River	65.30	66.30	1.00	G087007	196	1295	30.30	1740
SUN	SN07-01	Road River	95.96	96.76	0.80	G087009	269	1145	15.60	575
SUN	SN07-01	Road River	96.76	96.93	0.17	G087010	116	661	8.08	267
SUN	SN07-01	Road River	96.93	97.23	0.30	G087011	307	1210	18.15	774
SUN	SN07-01	Road River	97.23	97.73	0.50	G087012	318	1675	58.30	1450
SUN	SN07-02	Canol	32.18	33.34	1.16	G087013	316	2610	75.2	2510
SUN	SN07-02	Road River	33.34	33.84	0.50	G087014	310	1760	73.6	2380
SUN	SN07-02	Road River	33.84	34.34	0.50	G087015	309	1510	57.3	2570
SUN	SN07-02	Road River	34.34	34.50	0.16	G087016	396	1450	93.8	3080
SUN	SN07-02	Road River	34.50	35.00	0.50	G087017	300	1820	91.0	2540
SUN	SN07-02	Road River	35.00	36.00	1.00	G087019	265	1990	78.6	2800
SUN	SN07-02	Road River	36.00	37.50	1.50	G087020	254	2250	76.2	2620
SUN	SN07-03	Canol	77.73	79.23	1.50	G087021	161	355	29.0	210
SUN	SN07-03	Canol	79.23	80.73	1.50	GO87022	156.5	548	225.0	142
SUN	SN07-03	Canol	80.73	81.71	0.98	G087023	109	218	24.9	193
SUN	SN07-03	Canol	81.71	81.75	0.04	G087035	2570	8320	13.8	393
SUN	SN07-03	Canol	81.75	82.25	0.50	G087024	142	326	31.7	303
SUN	SN07-03	Canol	82.25	82.40	0.15	G087025	350	453	72.3	675
SUN	SN07-03	Canol	82.40	82.93	0.53	G087026	248	255	53.1	434
SUN	SN07-03	Canol	82.93	84.43	1.50	G087027	181.5	401	37.5	114
SUN	SN07-03	Canol	84.43	86.14	1.71	G087028	204	463	40.2	267
SUN	SN07-03	Canol	86.14	86.64	0.50	G087030	143	142	40.6	175
SUN	SN07-03	NiMo	86.64	86.65	0.01	G087031	30100	6300	1170	365
SUN	SN07-03	Road River	86.65	87.15	0.50	G087032	87.3	257	24.4	484
SUN	SN07-03	Road River	87.15	88.65	1.50	G087033	125.5	750	22.9	495
SUN	SN07-03	Road River	88.65	90.15	1.50	G087034	114	438	28.8	767
FOX	FX07-01	No Samples								
FOX	FX07-02	Canol	66.30	67.30	1.00	G087036	184.5	39	69.5	1505
FOX	FX07-02	Canol	67.30	68.30	1.00	G087037	366	323	83.9	1629
FOX	FX07-02	RR / Canol	68.30	68.50	0.20	G087038	478	113	75.1	1790
FOX	FX07-02	Road River	68.50	69.50	1.00	G087039	519	2330	67.2	1465
FOX	FX07-02	Road River	69.50	70.50	1.00	G087040	427	1780	36.7	1095
Property	**Hole**	**Unit**	**From (m)**	**To (m)**	**Sample Interval (m)**	**Sample**	**Ni (ppm)**	**Zn (ppm)**	**Mo (ppm)**	**V (ppm)**
FOX	FX07-03	Canol	79.79	80.29	0.50	G087041	267	3350	79.6	2880
FOX	FX07-03	Canol	80.29	80.54	0.25	G087042	251	3600	70.1	2490

FOX	FX07-03	Canol	80.54	81.04	0.50	G087043	262	5130	83.5	3470
FOX	FX07-03	Road River	114.56	115.56	1.00	G087044	242	1570	40.2	1740
FOX	FX07-03	Road River	115.56	116.56	1.00	G087045	249	1960	57.4	1925
FOX	FX07-03	Road River	116.56	116.84	0.28	G087046	293	1710	39.7	1535
FOX	FX07-03	Road River	116.84	117.84	1.00	G087047	210	1000	26.4	789
FOX	FX07-03	Road River	117.84	118.94	1.10	G087048	187.5	741	10.9	426
FOX	FX07-04	Canol	33.52	34.52	1.00	G087049	251	2820	74.5	2700
FOX	FX07-04	Canol	34.52	35.52	1.00	G087050	260	3030	78.6	2850
FOX	FX07-04	Road River	35.52	35.71	0.19	G087051	224	2860	62.5	2500
FOX	FX07-04	Road River	35.71	36.71	1.00	G087052	282	3750	88.1	3240
FOX	FX07-04	Road River	36.71	37.71	1.00	G087053	271	3470	87.3	3230

Table 5. Ni, Mo, Zn and V data for drill core samples from the former Sun and Fox properties.

Property	Hole	From (m)	To (m)	Unit	Interval (m)	Weighted Average V (ppm)	Weighted Average V_2O_5 (%)
SUN	SN07-01	62.63	66.30	Road River	3.67	2267	0.40
SUN	SN07-01	96.93	97.73	Road River	0.80	1197	0.21
SUN	SN07-02	32.18	37.50	Canol / Road River	5.32	2609	0.47
FOX	FX07-02	66.30	70.50	Canol / Road River	4.20	1441	0.26
FOX	FX07-03	79.79	81.04	Canol	1.25	3038	0.54
FOX	FX07-03	114.56	118.94	Road River	4.38	1222	0.22
FOX	FX07-04	33.52	37.71	Canol / Road River	4.19	2982	0.53

Table 6. Significant vanadium intervals in drill core from the former Sun and Fox properties.

Fox Property

Fox Property – Geology

The former Fox mineral property was located near the northern end of the WRM project area (Figure 14a). Four drill holes were completed on the former Fox property in 2007 (Figure 19). "Diamond drilling intersected shales belonging to the Canol Formation and the Road River Group in all holes except for FX07-01, which collared directly into Road River Group" (Dumala, 2007a, p. 5).

"In drill core, the Canol Formation shale is black, non-calcareous and finely laminar. It is slightly to moderately weathered, fissile and somewhat friable. The Road River Group comprised calcareous, finely laminar, black shale that is distinguished from shale belonging to the Canol Formation by its vigorous reaction with dilute hydrochloric acid" (Dumala, 2007a, p. 5).

Fox Property – Rock Geochemistry

Nickel–Molydenum Suite in Drill Core

"Drill core from FX07-03 and FX07-04 was very hard, almost cherty. The only recognizable differences between the Canol Formation and Road River Group were increases in carbonate content and competency within the Road River. The contact was often gradational, occurring over several metres and was not marked by a sulphide horizon or limestone ball member like other NiMo properties" (Dumala, 2007a, p. 5). A total of 13 samples was taken from these holes returning an average of 250 ppm nickel, 2692 ppm zinc, 61 ppm molybdenum and 2.82 ppm silver" (Dumala, 2007a, p. 5; Table 5).

The NiMo horizon was not observed in hole FX07-02 (no sulphides were observed in any of the core from this hole). "The contact area in FX07-02 exhibits sharper changes in carbonate content, competency and hardness. Five samples were taken from this hole returning an average of 395 ppm nickel, 917 ppm zinc, 66 ppm molybdenum and 1.00 ppm silver" (Dumala, 2007a, p. 5).

Vanadium in Drill Core

Hole FX07-02: The Road River – Canol contact in hole FX07-02 was placed at 68.37 m (NiMo horizon not present). Continuous sampling across the contact between 66.3 and 70.5 m (5 samples over 4.2 m of core) returned maximum values of 519 ppm Ni, 2330 ppm Zn, 83.9 ppm Mo and 1790 ppm V. The weighted average V content over the 4.2 m core interval is 1441 ppm V (0.26% V_2O_5). The Canol Formation is described as moderately hard, black shale. The Road River Group is described as medium to dark grey shale. No sulphides were observed in any of the core. This is the only interval of core sampling for the hole (Dumala, 2007a; Tables 2 and 6).

Hole FX07-03: The Road River – Canol contact in hole FX07-03 was placed at 113.56 m (the NiMo horizon was not observed). Samples were collected from two intervals of core – from 79.79 to 81.04 m and from 114.56 m to 118.94 m (Dumala, 2007a). Both of these intervals contain anomalous vanadium concentrations.

Three core samples from the Canol Formation between 79.79 and 81.04 m returned maximum values of 267 ppm Ni, 5130 ppm Zn, 83.5 ppm Mo and 3470 ppm V. The weighted average V content over the 1.25 m core interval is 3038 ppm V (0.54% V_2O_5). The core is described as black, very hard, competent shale with 1-3 cm carbonate horizons spaced every 0.1 to 1.5 m in the core along with 0.25 m interval of carbonate breccia (both rock types contain some pyrite). This interval is 32.5 m above (up hole from) the Road River – Canol contact (i.e. the expected location of the NiMo horizon).

Five core samples from the Road River Group between 114.56 m and 118.94 m returned maximum values of 293 ppm Ni, 1960 ppm Zn, 57.4 ppm Mo and 1925 ppm V. The weighted average V content over the 4.38 m core interval is 1222 ppm V (0.22% V_2O_5). This interval begins 1 metre below the Road River – Canol contact. The core is described as competent, black shale with a 1.2 m interval of light grey nodules.

Hole FX07-04: The Road River – Canol contact in hole FX07-04 was placed at 35.52 m (the NiMo horizon was not observed). Five core sample across the contact from 33.52 m to 37.71 m returned maximum values of 282 ppm Ni, 3750 ppm Zn, 88.1 ppm Mo and 3240 ppm V. The weighted average V content over the 4.19 m core interval is 2982 ppm V (0.53% V_2O_5). The core is described as black shale with thin (~1 mm thick) pyrite beds. This is the only interval of core sampling for the hole (Dumala, 2007a).

Geology and Geochemistry of the WRM Project Area

A geological map showing part of the Western Richardson Mountains including the WRM project area is presented in Figure 20.

The mineral assessment study of the Eagle Plains area by Heon (2006), which covered the area of the WRM project area, included the following stratigraphic unit descriptions.

Upper Road River Group

> "The youngest unit of the Road River, the upper Silurian to lower middle Devonian CDR4 (Norris) / Sdv (also vittrekwa formation, informal name) (Cecile), consists of recessive carbonaceous graptolitic black shales, interbedded with limestone and white-weathering black chert. Locally, the shale is very poorly lithified (disaggregated) and samples resemble peat. Pyrite nodules and bands are common. Limestone pods or balls occur near the top of the succession. A secondary white crystalline coating, probably gypsum, is common on cliffy exposures in the northern part of the study area" (Heon, 2006, p. 17).

Canol Formation

> "Unconformably overlying the Road River Group, the Canol Formation (Dca/ Dc) consists of rusty-weathering, thin bedded (pyritic) chert, blue-weathering siliceous shale and local limestone pods. The shales and cherts weather with a distinctive yellow iron-rich earthy coating (jarosite?)" (Heon, 2006, p. 17).
>
> "In the southern part of the study area, the contact between the top of the Road River Group and the Canol Formation is exposed and is characterized by a specific lithologic sequence …. The top of the Road River Group is marked by a limestone concretion-bearing unit within carbonaceous shales. This unit consists of meter-scale limestone balls strung out along one bed. This distinctive horizon is overlain by a 30 to 50 cm thick horizon of highly fractured siliceous shale that contains small, locally pyritic, disc-shaped barite nodules that seem to replace limestone. Immediately overlying this horizon, a thin sulphide-rich horizon is host to Ni-PGE-Au mineralization …. This horizon is in turn overlain by the rusty weathering thin-bedded cherts of the Canol Formation. This same setting has been traced for more than 9 km along strike. Outcrops of this contact have not been found in the northern part of the study area due to its recessive nature" (Heon, p. 17-19).

Structure

> The project area is located on the western limb of the northern Richardson Anticlinorium, which has a northerly plunge in the area. Strata in the project area have northerly trends and westerly dips. Measurements of bedding in the project area indicate that dips vary from as shallow as 6°W in the northern part of the area, near the nose of the fold, to as steep as 85°W in the southern project area (Cecile et al., 1982).

Glacial History

The WRM project area lies within unglaciated terrain (Duk-Rodkin, 1999).

Geochemistry

Geological and geochemical data obtained during 2007 and 2008 exploration of the former Fox and Sun properties, which were located near the proposed 2020 project area, are described in previous sections of this report.

The field locations of rock samples obtained during the Eagle Plain area mineral assessment study (Heon, 2006) containing ≥ 400 ppm V and collected near the 2020 project area are shown in Figure 20 and listed in Table 7. Most of the vanadium rich samples, including sample 96DH021D with 2300 ppm V (0.41% V_2O_5), are from the Road River Group. Note that some of these samples also show enrichment in Ag, As, Ba, Cu, Mo, Ni, Sb, and Zn.

Analytical data for stream sediment samples collected by the Geological Survey of Canada from NTS map areas 116I/09 and 116I/16, which includes the WRM project area, do not include vanadium analyses (Hornbrooke and Lynch, 1977; Heon, 2006).

Total Organic Carbon: Fraser et al. (2012) completed total organic carbon (TOC) analyses on industry drill core from the Fox, Rich and Pe properties (the Pe property is located near the Peel River). "Total organic carbon values for the Canol Formation are 0.3 to 20.1 wt % with most samples containing 2 to 5 wt % TOC. For the Road River Group, TOC values are 1.0 to 19.3 wt % with most less than 5 wt %. The Imperial Formation TOC values are mainly below 1 wt %" (Fraser et al., 2012, p. 45). These high TOC values are important as vanadium is commonly associated with organic matter in marine sediments. The highest TOC values in the Road River Group and the Canol Formation were not associated with the Road River Group – Canol Formation contact.

Joyal Occurrence: A description of the Joyal occurrence (Minfile 116H 071), which occurs in the 2020 project area, is provided by Heon (2006). "A quartz and calcite vein of very coarse grain size contains 1% interstitial chalcopyrite, malachite and limonite. Sample 95DH-53 returned values of 6810 ppm Cu and 80 ppb Au …. Coarse calcite veins are common in the area but this rare instance of copper mineralization coincides with the rare occurrence of quartz in this vein" (Heon, 2006, p. 16).

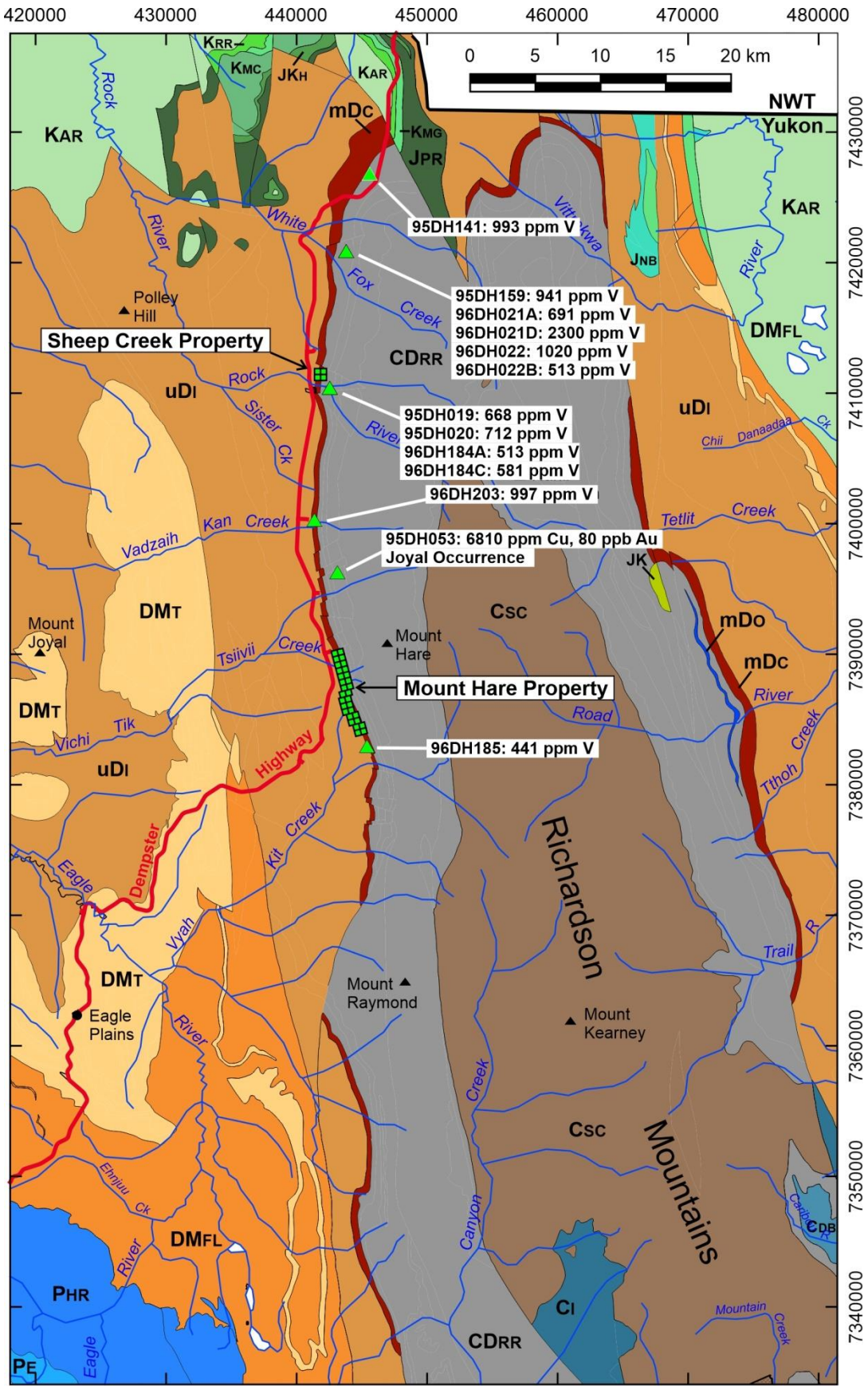


Figure 20. WRM project area geology map (Cecile et al., 1982; Yukon Geological Survey, 2018) showing selected rock sample analytical results from Heon (2006). See Figure 14b for legend.

Sample	East	North	Datum	Unit	Description	Ag (ppm)	As (ppm)	Ba (ppm)	Cu (ppm)	Mo (ppm)	Ni (ppm)	Sb (ppm)	U (ppm)	V (ppm)	V_2O_5 %	Zn (ppm)
95DH019	442532	7410243	NAD83	Canol? / Road River?	0.5 m chip of fractured shales coated w rusty and white gypsum?	2.4	60	110	124	10	205	8	10	668	0.12	1190
95DH020	442532	7410243	NAD83	Road River?	brecc. shale w lim-gyps-qtz? Coating on fract and lining Fx. tr malach. Float	3.2	86	160	309	25	148	52	<10	712	0.13	832
95DH141	445588	7426650	NAD83	Canol?	platy shales w yellow weathering, chip 0.5 m	0.2	14	490	48	70	95	<2	<10	993	0.18	126
95DH159	443789	7420715	NAD83	Road River	rusty carb grapt sh w 2 thin horizons semi-mass py, chip of 0.3 m	1.6	34	40	116	62	182	6	<10	941	0.17	900
95DH185	445385	7382791	NAD83	Canol	layer of decomposed Rx or soil gouge w/in sil shales, incl crumbly rusty mat	0.8	260	510	301	27	162	14	40	441	0.08	168
96DH021D	443789	7420715	NAD83	Road River	siliceous shales, brown-orange-red weathering, o/c	1.6	40	1020	40	95	77	4	<10	2300	0.41	334
96DH021A	443789	7420715	NAD83	Road River	beige baritic pod? Containing small carb xtals, s/c	0.6	14	6240	22	16	53	<2	<10	691	0.12	400
96DH022	443789	7420715	NAD83	Road River	black carbonaceous graptolitic shales, o/c	0.8	46	1580	123	55	184	2	10	1020	0.18	848
96DH022B	443789	7420715	NAD83	Road River	thin red-rusty horizon, locally punky, beige green, disintegrated sulph, o/c	0.8	68	100	83	99	166	10	<10	513	0.09	556
96DH184A	442532	7410243	NAD83	Road River	flaky black grungy shale, some malach-az? Coating, round vugs? o/c	1.4	78	440	361	29	112	106	<10	513	0.09	1325
96DH184C	442532	7410243	NAD83	Road River	grungy broken up zone in sh w malach-az coating w carb or gypsum veining, o/c	1.8	218	70	939	37	1255	218	<10	581	0.10	2340
96DH203	441353	7400126	NAD83	Road River	chips of beige weathering chert and cherty shale, float	0.8	18	410	43	26	42	8	<10	997	0.18	152

Table 7. List of rock samples with >400 ppm vanadium collected during Eagle Plain area mineral assessment (Heon, 2006).

Review of Global Shale Hosted Vanadium Projects with Calculated Resources

Resource data for several advanced shale-hosted vanadium projects where vanadium is the dominant or only economic component are presented in Table 8. The grade and tonnage values of these deposits, along with cutoff grades, indicate that values of 0.20% V_2O_5 (and possibly lower) in shale are economically significant.

Deposit	Area	Resource Category	Mt	V_2O_5 (%)	Notes and Data Sources	Geology
Gibellini	Nevada	Measured and Indicated	23	0.286	cut-off grade of 0.101% V_2O_5 in oxide zone) and 0.086% V_2O_5 in transition zone	Devonian Woodruff Formation black shale
		Inferred	15	0.175		
Louie Hill	Nevada	Inferred	7.52	0.276	cut-off grade of 0.101% V_2O_5; part of Gibellini Vanadium project	Devonian Woodruff Formation black shale
Bisoni McKay	Nevada	Indicated	11.9	0.390	0.2% V_2O_5 cut-off grade	Devonian Woodruff Formation black shale
		Inferred	7.05	0.420		
Carlin Vanadium	Nevada	Indicated	24.6	0.615	43-101 (2019); 0.3% V_2O_5 cut-off grade	Devonian Woodruff Formation black shale
		Inferred	7.19	0.520		
Viken	Sweden	Indicated	8.9	0.199	also 274 ppm Mo and 156 ppm U	Cambrian black shale (Alum Shale)
		Inferred	214	0.201	also 288 ppm Mo and 155 ppm U	
Julia Creek	Queensland, Australia	Indicated and Inferred	2760	0.300	cut-off grades of 0.20% V_2O_5 for the oil shale and 0.15% V_2O_5 for the coquina units; resources consist of 220 Mt indicated and 2540 Mt inferred; also 201 ppm Cu, 166 ppm Mo, 170 ppm Ni, 1043 ppm Zn and contingent oil resource	black oil shale and coquina of the Cretaceous (Albian) Toolebuc Formation

Table 8. Summary of resource data for shale hosted vanadium projects where vanadium is the dominant or only economic component. Mt = million tonnes (million metric tons). All resource figures are from NI 43-101 reports except for Julia Creek. Sources: Gibellini and Louie Hill – Hanson et al. (2018); Bisoni McKay – Bentzen (2016); Carlin Vanadium – Stryhas (2019); Viken – Puritch et al. (2010); Julia Creek – QEM website [qldem.com.au/project/ accessed 2020-APR-10] and Lewis et al. (2010).

Review of Vanadium in the Western Richardson Mountains (Based on Pre-2020 Work)

Economically significant vanadium results (≥ 0.20% V_2O_5) have been obtained from outcrop and drill core samples collected in the western Richardson Mountains. Note that several of the drill core intersections are open above and below (i.e. no samples were collected from core above or below the vanadium mineralized interval). The data were collected during (i) industry exploration of the NiMo horizon and (ii) government research of the NiMo horizon so most of the available data is for samples collected within a few 10's of metres of the Road River Group – Canol Formation contact. Shale containing high vanadium content is not necessarily visually distinctive and most of the core from the industry drilling in the western Richardson Mountains was not sampled.

Diamond drilling on the former on the former Sun and Fox properties occurred between 3 and 13 km north of the WRM project Rock River (Sheep Creek) field area; Figure 19). Ni, Zn, Mo and V results for drill core samples collected from the 2007 drilling on the former Sun property (SN holes) and Fox property (FX holes) is listed in Table 5 and a summary of vanadium grades from all of the sampled core intervals is presented in Table 6.

The four best intersections are (i) 0.53% V_2O_5 over 4.19 m in drill hole FX07-04, (ii) 0.47% V_2O_5 over 5.32 m on hole SN07-02, (iii) 0.40% V_2O_5 over 3.67 m in drill hole SN07-01, and (iv) 0.54% V_2O_5 over 1.25 m in drill hole FX07-03. In all of these intersections the mineralized interval is open above and below. Based on core logging:

- The V-rich zone in hole SN07-01 occurs in the Road River Group several 10's of metres below the Road River – Canol contact.
- The V-rich zones in holes SN07-02 and FX07-04 straddle the Road River – Canol contact.
- The V-rich zone in hole FX07-03 occurs in the Canol Formation about 30 m above the Road River – Canol contact.

The only hole that intersected the NiMo horizon during the 2007 drilling on the former Sun and Fox properties, hole SN07-03, returned 3.01% Ni, 0.63% Zn and 1170 ppm Mo across 1 cm (86.64 to 86.65 m). The NiMo horizon returned only 365 ppm V and the strata above and below the NiMo horizon are not particularly enriched V (the maximum V value from contiguous samples between 77.73 m and 90.15 m is 675 ppm).

Field Exploration Overview

Field work completed on the WRM project in 2021 included geological mapping, stream silt sampling, soil and scree sampling, and rock sampling. Field sample descriptions, laboratory methods and analytical results are presented in Appendices 1 to 7. Work was undertaken in the Sheep Creek property area and the Mount Hare property area (Figure 20). Details of the 2020 field program are included in Prior (2021).

Exploration work in 2021 was undertaken on the Sheep Creek and Mount Hare property areas, which are located east of the Dempster Highway within the western foothills of the Richardson Mountains. Access was obtained by a combination of truck travel (along the Dempster Highway), quad travel and hiking. The Richardson Mountains are generally north trending and streams on the western flank tend to flow in a westerly direction. This drainage tends to create westerly sloping valleys separated by minor ridges or spurs with east-west orientations and ridgelines that, overall, slope relatively gently to the west (Figures 21 and 22).

Stream silt samples were collected from fine grained sediments and/or from moss mats. Samples were collected from several locations within an area of a few metres and, where possible, active (in stream) material was chosen. Large pleated kraft sample bags were filled to maximum capacity.

Soil and scree sampling traverse were undertaken along the ridgelines of the east-west trending minor ridges (spurs) to take advantage of the thin overburden. Areas covered in scree are common and samples varied from material that was nearly 100% “fines” (clay to very coarse sand) to nearly 100% scree fragments (rock fragments larger than very coarse sand). Sand-sized material was uncommon and most fine grained material is silty although silty clay, clayey silt, and clay were encountered locally. The organic (Ah horizon) varied from non-existent (scree areas) to a few 10’s of centimetres in thickness. Mineral soil profiles are generally poorly developed with enriched upper-B horizon rarely evident. Permafrost was encountered as some sites.

Soil and scree samples were collected with a long handled geotul (combined hammer and mattock) or shovel at depths of 15 to 40 cm and placed in a large, pleated kraft sample bag. The bags were filled from 5 to 8 cm above the base). Rock fragments greater that 1 cm across were excluded from the sample material except in rare cases during the 2020 sampling program where the scree was unusually coarse and material up to 2 cm across was included (noted in sample description comments). Nominal sample spacing along traverses was 25 m with some variability due the presence of absence of suitable sampling sites. Scree characteristics were included in field notes at sites where a significant component of scree was present. Observations included the degree to which the fragments were calcareous (based on reaction to dilute [10%] HCl) and the percentage of chert fragments.

Canol Formation scree tends to be dominantly composed of small (typically < 5 cm across) fragments of weakly blocky to moderately fissile, non-calcareous, medium grey weathering, dark grey to black siliceous shale with laminae commonly visible on weathered surfaces. Black, black weathering chert fragments typically 1 to 5 cm thick and up to >10 cm thick (representing original thickness of chert beds

or lenses) commonly form a minor component of Canol Formation scree but are not ubiquitous (chert locally forms up to 50% of the Canol Formation scree but generally forms <5%).

The Road River Group scree encountered on sampling traverses tends to be light to medium grey, light to medium grey weathering, weakly to strongly fissile and weakly to strongly calcareous. Platy scree fragments, which may be >10 cm across, are common at some sites.

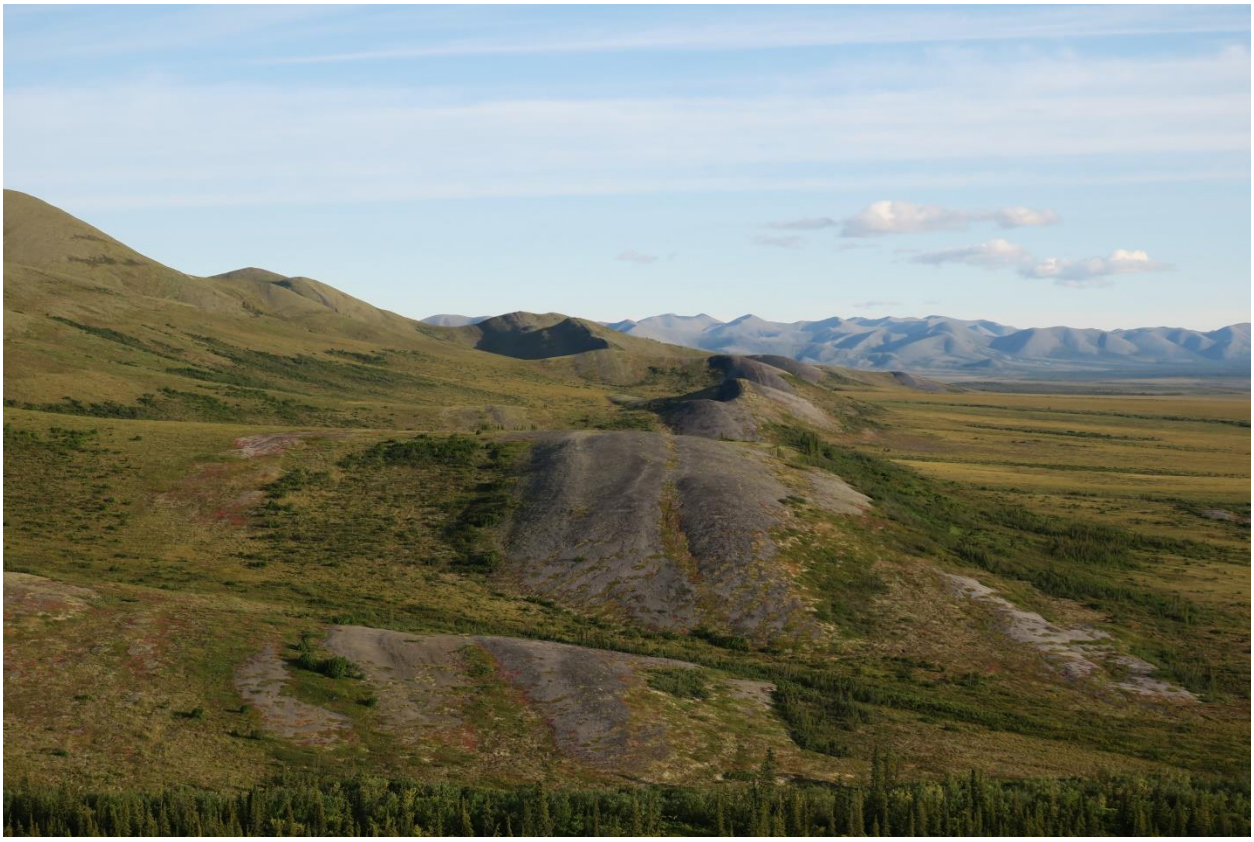


Figure 21. Southerly view of foothills topography of the western Richardson Mountains in the Mount Hare property area. The low, dark grey, scree covered hills (knobs) to the west (right) are underlain by the Canol Formation. The steeply sloping hills to east (left) are underlain by the Road River Group. The overall trend of the Richardson Mountains in approximately north-south (parallel to stratigraphy). However, easterly flowing streams dissect the foothills and create minor ridges (spurs) that trend east-west. Soil and scree traverses were undertaken along the ridgelines of the minor ridges. Note that the dark colour of the Canol Formation scree is caused, in part, by black lichen. View to 165° from 442967E, 7390144N (NAD83, Zone 8W).

Figure 22. Easterly view along a minor ridge in the Mount Hare property area. The minor ridge (foreground) is underlain the Canol Formation. The ridges and peaks in the background are underlain by the Road River Group. The scree in the foreground (partly in shadow) is composed of medium grey weathering, non-calcareous shale and black weathering chert of the Canol Formation. Thirty to fifty percent of the surface area of the foreground scree is covered by black lichen, which contributes to the dark colouration. Photo taken near soil/scree sample site RM538. View to 070° from 442807E, 7390084N (NAD83, Zone 8W).

Rock sample were obtained from stream bank outcrops in the Rock River (Sheep Creek) area by collecting continuous rock chips over a width of 50 cm perpendicular to bedding. Two samples were collected at each site: (i) a sample for laboratory analysis and (ii) a representative sample to be retained. Samples submitted for geochemical analyses typically weighed about 0.5 kg.

Location information was obtained using a Garmin GPSMAP 64st instrument. Location units are presented in the UTM NAD83 coordinate system (Zone 8W). Horizontal accuracy, as measured by the instrument, is generally within 3 m. The instrument does not display vertical accuracy but it is much poorer than horizontal accuracy.

Soil, scree samples and silt samples collected in 2021 were analyzed at Bureau Veritas in Vancouver, BC where they underwent multi-acid digestion digestion and ICP-MS analyses. Multi-acid digestion was chosen in order to obtain near-total values for vanadium (methods described in Appendix 4).

Rock samples collected in 2021 were shipped to MSALABS in Langley, British Columbia where they underwent whole rock analyses by lithium borate fusion – ICP/OES for major oxides and vanadium, carbon and sulphur determinations by the LECO method, and multi-element analyses for base metals, gold, silver and other elements by aqua regia digestion and ICP-AES/MS determination (methods described in Appendix 4).

Sheep Creek Property Area

Sheep Creek Property Description

The Sheep Creek Property is a group of 4 quartz claims (SC 1 to SC 4) located east of the Dempster Highway and north of Rock River (also known as Sheep Creek) in NTS map area 116I/16 (Table 9, Figure 3 and Figure 23). The claims are registered in the Dawson Mining District to Glen Prior.

Property	Claim Name	Tag Number	Recording Date
Sheep Creek	SC 1	YF74711	2020-08-28
	SC 2	YF74712	2020-08-28
	SC 3	YF74713	2020-08-28
	SC 4	YF74714	2020-08-28

Table 9. Sheep Creek property (MH claims) – claim list.

Note on Rock River – Sheep Creek Terminology: The westerly flowing Rock River, as identified on the 1:50,000 topographic map, lies south of the Sheep Creek property and is crossed by the Dempster Highway at about 7409900 m north (UTM, NAD83, Zone 8W). However, a highway sign at this crossing identifies this stream as Sheep Creek. At about 325 m upstream from the highway the stream divides into two major branches (east branch and south branch). Both branches are similar in size – the 1:50,000 topographic map identifies the south branch as being the upstream continuation of Rock River.

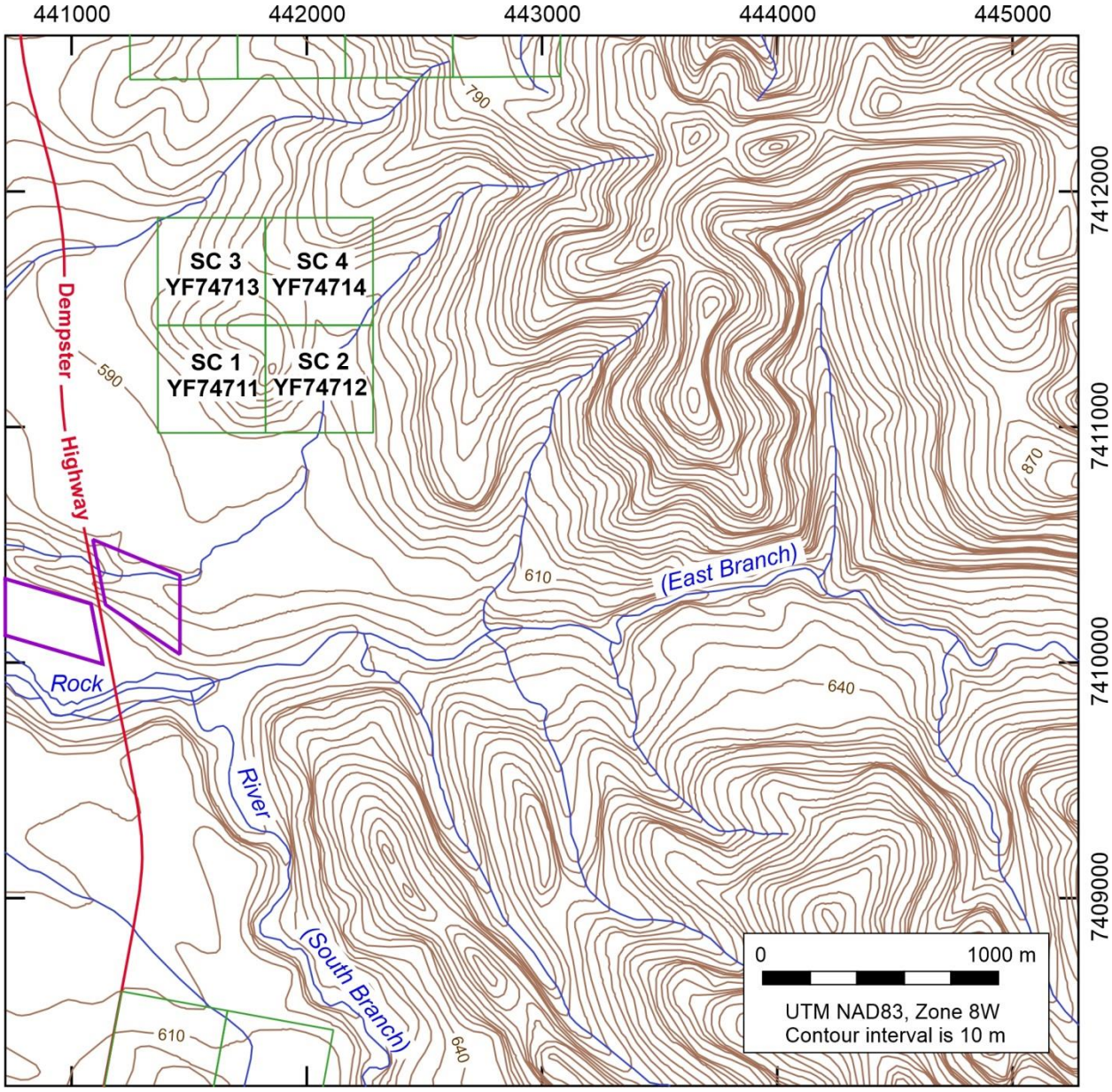


Figure 23. Claims of the Sheep Creek property (quartz claims SC 1 to SC 4). Claim boundaries shown in green. First Nation Settlement Lands shown with purple boundaries.

Geology

The government geological map of the area (Cecile et al., 1982: Yukon Geological Survey, 2018) has been modified based on 2020 and 2021 field observations and geochemical data (chemostratigraphy; Figures 24 and 25). Government geological mapping (Cecile et al., 1982; Yukon Geological Survey, 2018) shows this to be an area of structural complexity with the Road River Group – Canol Formation contact offset by both earlier, approximately east-west faulting and a later northwest trending fault.

Interbedded grey limestone (limy shale), black calcareous shale and black chert (in beds that are locally >20 cm thick of River Group unit CDR4 were observed about 900 m east of the Road River Group – Canol Formation contact along the east branch (sample sites RM402 to RM405; Figure 26).

Most of the Road River Group observed along the east and south branches consists of calcareous shale (unit CDR5 of Yukon Geological Survey, 2018; Figures 27 and 28). Graptolites occur locally.

Canol Formation outcrops along the north side of the east branch consist primarily of siliceous, non-calcareous shale. These strata appear to conformably overlie the Road River Group. However, the NiMo horizon, which commonly occurs at this contact, was not observed. It is possible that contact is a fault and that this section is similar to the one mapped by Fraser and Hutchinson (2017) on the Trail River, where the NiMo layer is missing and the Road River Group – Canol Formation contact is interpreted to be faulted. Canol Formation strata north of the east branch, in apparent stratigraphic contact with the underlying Road River Group, is consistent with the mapping of Cecile et al. 1982), which places the local east-west trending fault in the valley of the east branch of the Rock River (Sheep Creek).

The observed Canol Formation west of the south branch (sample sites RM426 and RM427) consists of shaly chert and chert with a tendency to be cliff forming (Figures 29 and 30).

Field observations and geochemical results indicate that within the rock sampling area only the northern (downstream) part of the south branch lies within the Canol Formation with the rest of the area (at least at stream level) being underlain by Road River Group strata. A northeast trending fault was observed in the western bank of the south branch at 441656E, 7409477N (UTM NAD 83, Zone 8W). Calcareous Road River Group shale occurs to the south of the fault while the non-calcareous Canol Formation occurs to the north. Bending of bedding toward the fault suggests north side down relative displacement (this is consistent with the fault juxtaposition of younger Canol Formation strata (to the north) against older Road River Group strata (to the south). The surface that appears to be the main fault plane has an orientation of 056°/62°N.

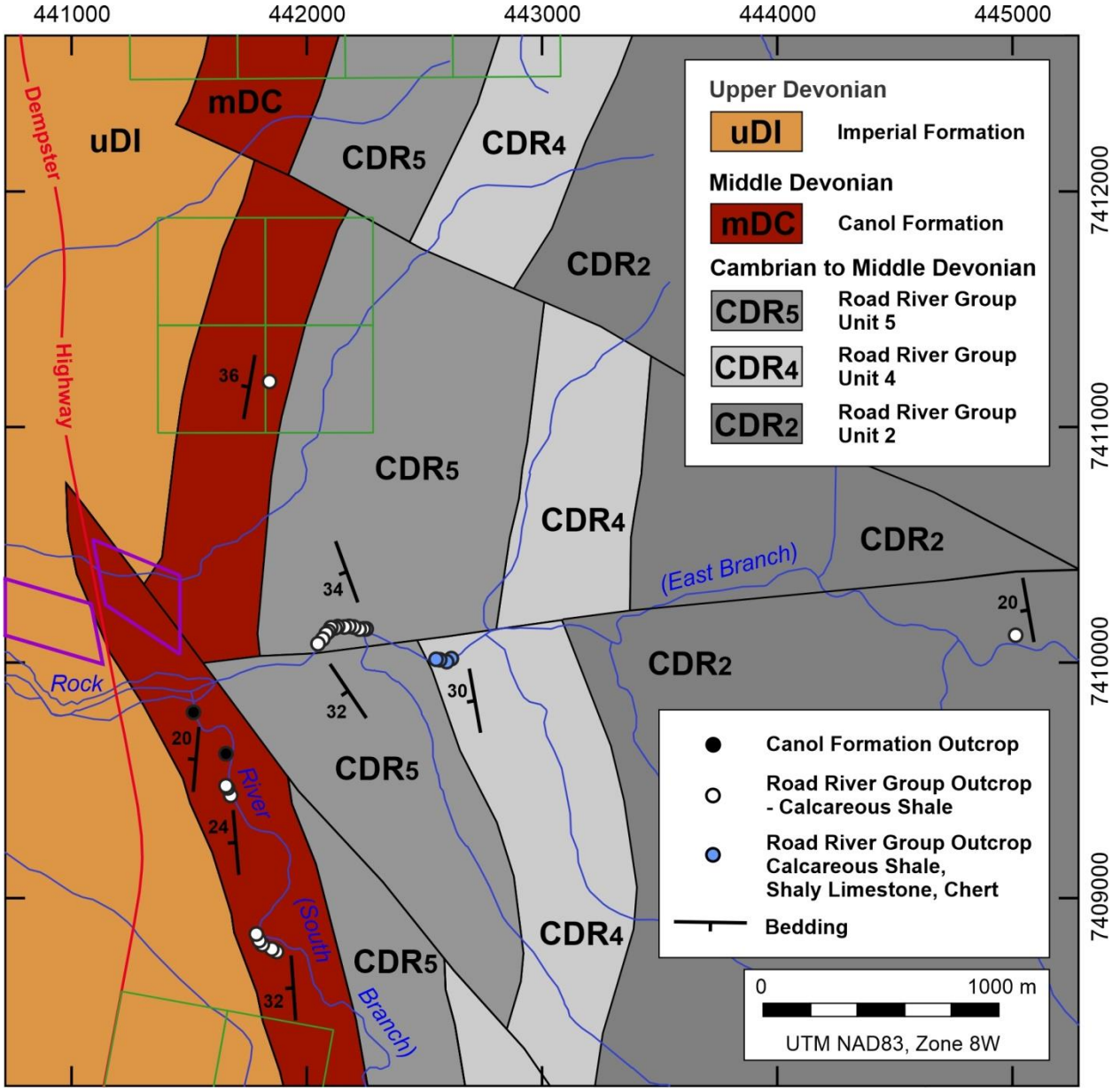


Figure 24. Geology of the Rock River (Sheep Creek) field area (Cecile et al., 1982: Yukon Geological Survey, 2018). The Sheep Creek property consists of the 4 claims shown north of the Rock River. Claim boundaries shown in green. Boundary of First Nation Settlement Lands in purple.

uDl – Imperial Formation: dark grey shale, siltstone, sandstone

mDC – Canol Formation: dark grey to black, non-calcareous shale

CDR_5 – Road River Group unit 5: black shale and shaly limestone

CDR_4 – Road River Group unit 4: shaly limestone and dolostone, subordinate black, calcareous shale

CDR_2 – Road River Group unit 2: shaly limestone, black chert, shale

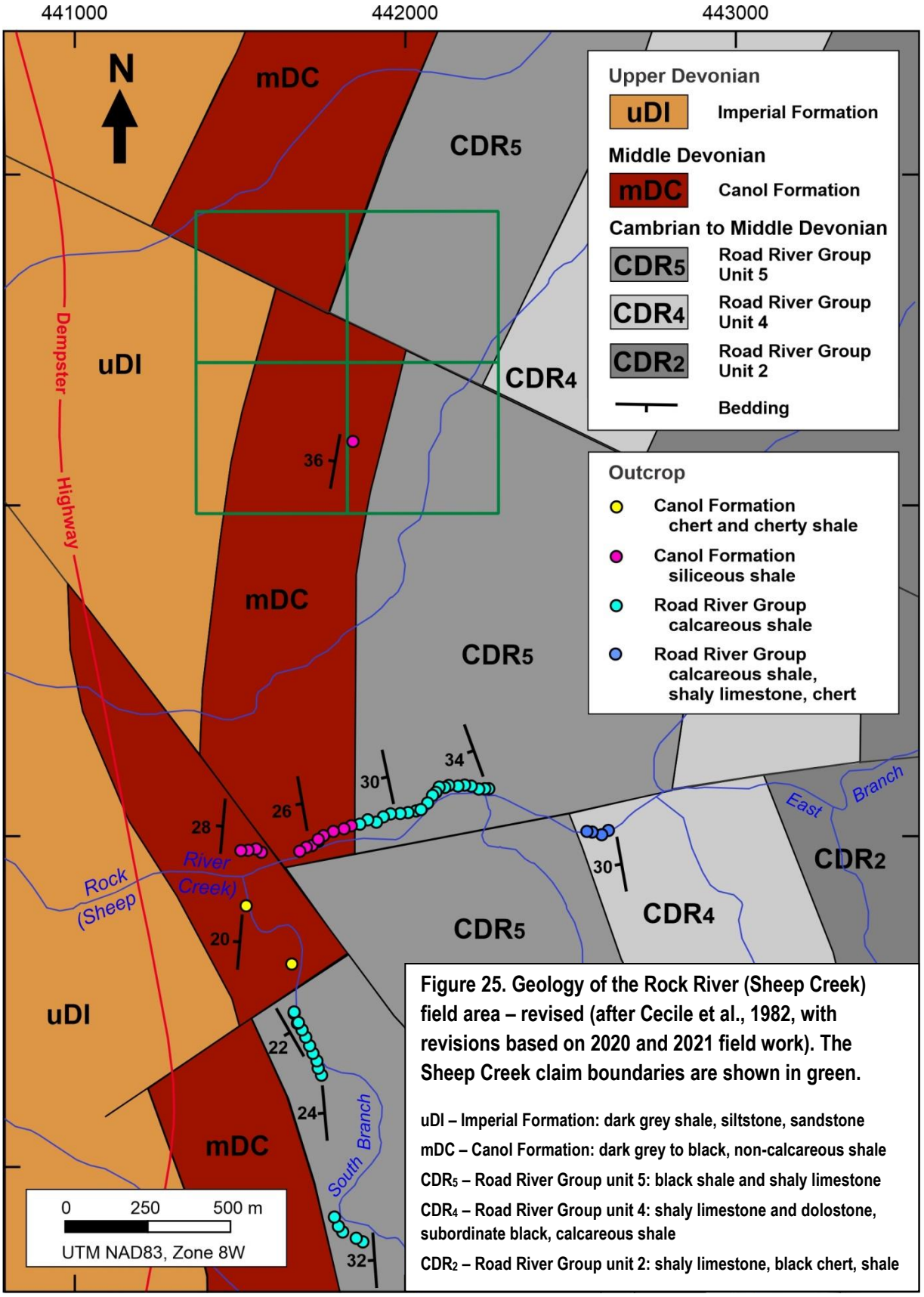


Figure 25. Geology of the Rock River (Sheep Creek) field area – revised (after Cecile et al., 1982, with revisions based on 2020 and 2021 field work). The Sheep Creek claim boundaries are shown in green.

uDl – Imperial Formation: dark grey shale, siltstone, sandstone

mDC – Canol Formation: dark grey to black, non-calcareous shale

CDR_5 – Road River Group unit 5: black shale and shaly limestone

CDR_4 – Road River Group unit 4: shaly limestone and dolostone, subordinate black, calcareous shale

CDR_2 – Road River Group unit 2: shaly limestone, black chert, shale

Figure 26. Interbedded grey limestone (limy shale), black calcareous shale (e.g.at hammer head) and black chert (e.g. above end of hammer handle) at sample site RM 405 within the Road River Group unit CDR4 about 900 m east of the Road River Group – Canol Formation contact. View to south from 442549E, 7410014N (UTM, NAD 83, Zone 8W). Hammer handle is about 70 cm long.

Figure 27. Section of Road River Group unit CDR5 calcareous shale exposed in north bank of the east branch of Rock River (Sheep Creek). This photo shows part of the section from which the RM406 to RM418 series of rock chip samples was collected. View is to 290° from 442273E, 7410117N (UTM, NAD 83, Zone 8W).

Figure 28. View of rock chip sample site RM410 (calcareous shale of the Road River Group unit CDR5). North bank of east branch of Rock River (Sheep Creek). View to north from 442179E, 7410154N (UTM, NAD 83, Zone 8W). Hammer is about 70 cm long.

Figure 29. Cliff of Canol Formation shaly chert / chert near confluence of the south and east branches of Rock River (Sheep Creek). This cliff lies between sample sites RM426 and RM427. View is to the west from 441675E, 7409660N (UTM, NAD 83, Zone 8W).

Figure 30. Near-vertical exposure of Canol Formation shaly chert / chert (rock chip sample RM427sample site). Hammer handle is about 70 cm long (442273E, 7410117N; UTM, NAD 83, Zone 8W).

Rock Samples

Fifty-five rock chip samples (50 cm chips across bedding) were collected from outcrops exposed in steep banks along the east and south branches of Rock River (Sheep Creek) with 26 collected in 2000 and 29 collected in 2021 (Figure 31). At selected locations with extensive shale outcrop a series of rock chip samples were collected at nominal spacing of 25 m.

The rock geochemical data set consist of analyses for (i) two Canol Formation chert and cherty shale samples, (ii) 12 samples of Canol Formation siliceous shale, (iii) 37 calcareous shale samples assigned to unit CDR5 of the Road River Group, and (iv) 4 samples of interbedded limestone (limy shale), calcareous shale and chert assigned to unit CDR4 of the Road River Group (Figures 32 to 38).

The data presented below demonstrate that chemostratigraphy based on silica, calcium and barium (determined using fusion digestion methods) can be used to identify the Road River Group – Canol Formation contact in the section north of Rock River (Sheep Creek). The presence of high Ba levels in the upper Road River Group is consistent with the presence of barite concretions in strata below the Road River Group – Canol Formation contact observed in sections measured by Fraser and Hutchinson (2017) and Gadd et al. (2018).

The geochemical results also show that significant enrichment in vanadium, nickel, molybdenum and zinc occur in the upper Road River Group and the lower Canol Formation.

Rock SiO_2 (Figure 32)

- Canol Formation shaly chert / chert: 85.30 and 86.78% SiO_2.
- Canol Formation siliceous shale: 70.89 to 92.36% SiO_2.
- Road River Group calcareous shale (unit CDR5): 26.81 to 68.23% SiO_2.
- Road River Group limestone / calcareous shale / chert (unit CDR4): 42.5 to 78.33% SiO_2. The amount of limestone, shale and chert varies widely in the sampled outcrop.

Rock CaO (Figure 33)

- Canol Formation shaly chert and chert: 0.09% and 0.14% CaO.
- Canol Formation siliceous shale: 0.03% to 7.02% CaO (mainly <3% CaO).
- Road River Group calcareous shale (unit CDR5): 0.87 to 13.48% CaO (mainly >4% CaO).
- Road River Group interbedded limestone, calcareous shale and chert (unit CDR4): 6.91 to 27.62% CaO.

Rock BaO (Figure 34)

- Canol Formation shaly chert and chert: 0.20% and 0.22% BaO.
- Canol Formation siliceous shale: 0.13% to 0.65% BaO (mainly <0.4% BaO).
- Road River Group calcareous shale (unit CDR5): 0.57% to 3.98% BaO (mainly >0.8% BaO).
- Road River Group limestone / calcareous shale / chert (unit CDR4): 0.05 to 0.19% BaO.

Rock V (Figure 35)

- Canol Formation shaly chert and chert: 0.09 and 0.12% V.
- Canol Formation siliceous shale: 0.06 to 0.27% V.
- Road River Group calcareous shale (unit CDR5): 0.02 to 0.23% V.
- Road River Group limestone / calcareous shale / chert (unit CDR4): <0.1 to 0.02% V.

There is a pronounced vanadium enrichment in samples collected from the upper Road River Group (upper part of unit CDR5) and the lower Canol Formation.

- Samples RM1401 to RM1416, collected over a 372 m traverse spanning (and roughly perpendicular to) the Road River Group – Canol Formation contact, returned an average of 0.17% V (0.31% V_2O_5). Note that these are 0.5 m chip samples collected about 25 m apart. This interval includes:
    - an average of 0.21% V (0.37% V_2O_5) for samples collected over 225 m, and
    - an average of 0.27% V (0.48% V_2O_5) for samples collected over 55 m (the three highest vanadium values (0.26 to 0.28% V) were collected from sites within the lower Canol Formation).

Rock Ni (Figure 36)

- Canol Formation shaly chert and chert: 8.2 and 8.4 ppm Ni.
- Canol Formation siliceous shale: 8.7 to 193.8 ppm Ni.
- Road River Group calcareous shale (unit CDR5): 36.5 to 256.4 ppm Ni.
- Road River Group limestone / calcareous shale / chert (unit CDR4): 14.6 to 40.5 ppm Ni.

Samples RM414 to RM418 and RM1401 to RM1416, collected over a distance of 464 m spanning the Road River Group – Canol Formation contact, returned an average of 164 ppm Ni. The four highest values, 256.4, 254.0, 207.1 and 207.0 ppm Ni, were obtained from samples collected in the upper Road River Group.

Rock Mo (Figure 45):

- Canol Formation shaly chert and chert: 34.85 and 46.75 ppm Mo.
- Canol Formation siliceous shale: 25.66 to 76.17 ppm Mo.
- Road River Group calcareous shale (unit CDR5): 2.19 to 104.2 ppm MO.
- Road River Group limestone / calcareous shale / chert (unit CDR4): 3.14 to 7.07 ppm Mo.

Samples RM415 to RM418 and RM1401 to RM1416, collected over a distance of 451 m spanning the Road River Group – Canol Formation contact, returned an average of 60 ppm Mo. The three highest values, 104.2, 96.39 and 91.53 ppm Ni, were obtained from samples collected in the upper Road River Group.

Rock Zn (Figure 46)

- Canol Formation shaly chert and chert: 7 and 9 ppm Zn.
- Canol Formation siliceous shale: 6 to 2751 ppm Zn
- Road River Group calcareous shale (unit CDR5): 79 to 1920 ppm Zn.
- Road River Group limestone / calcareous shale / chert (unit CDR4): 16 to 105 ppm Zn,

Samples RM1404 to RM1415, collected over a distance of 441 m spanning the Road River Group – Canol Formation contact, returned an average of 1429 ppm Zn. A subset of this interval, collected over a distance of 94 m within the Canol Formation, return an average of 2005 ppm Zn.

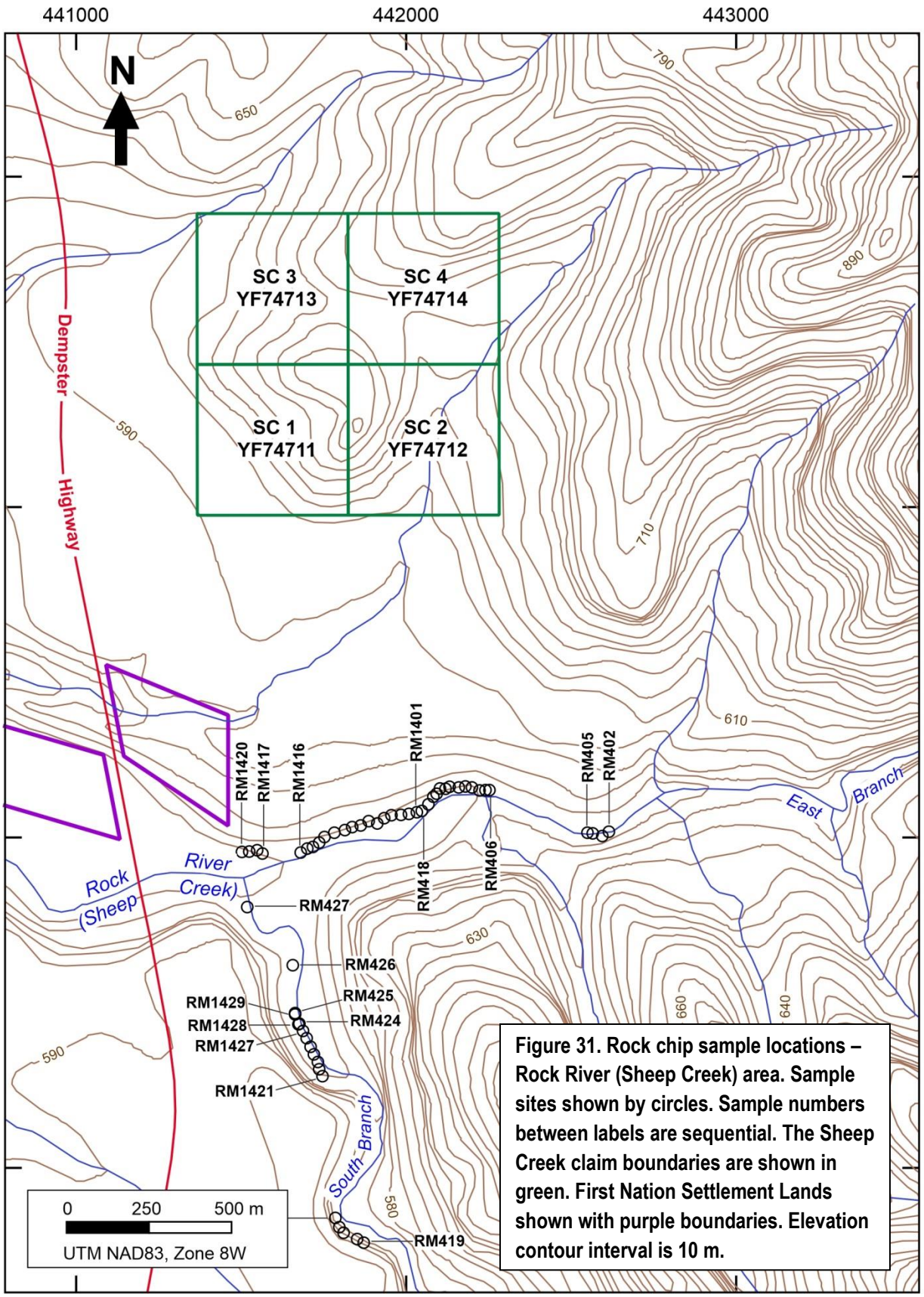


Figure 31. Rock chip sample locations – Rock River (Sheep Creek) area. Sample sites shown by circles. Sample numbers between labels are sequential. The Sheep Creek claim boundaries are shown in green. First Nation Settlement Lands shown with purple boundaries. Elevation contour interval is 10 m.

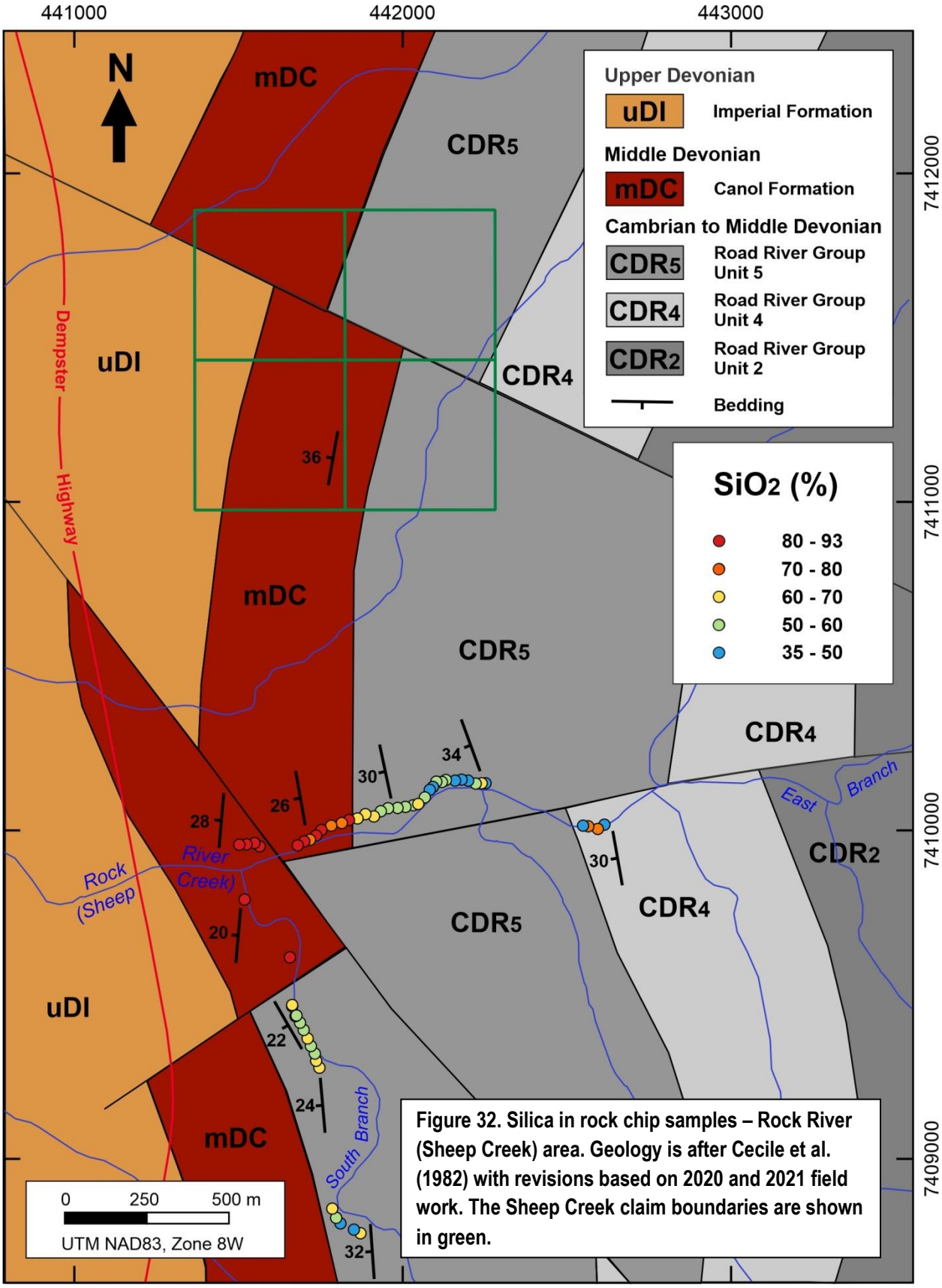


Figure 32. Silica in rock chip samples – Rock River (Sheep Creek) area. Geology is after Cecile et al. (1982) with revisions based on 2020 and 2021 field work. The Sheep Creek claim boundaries are shown in green.

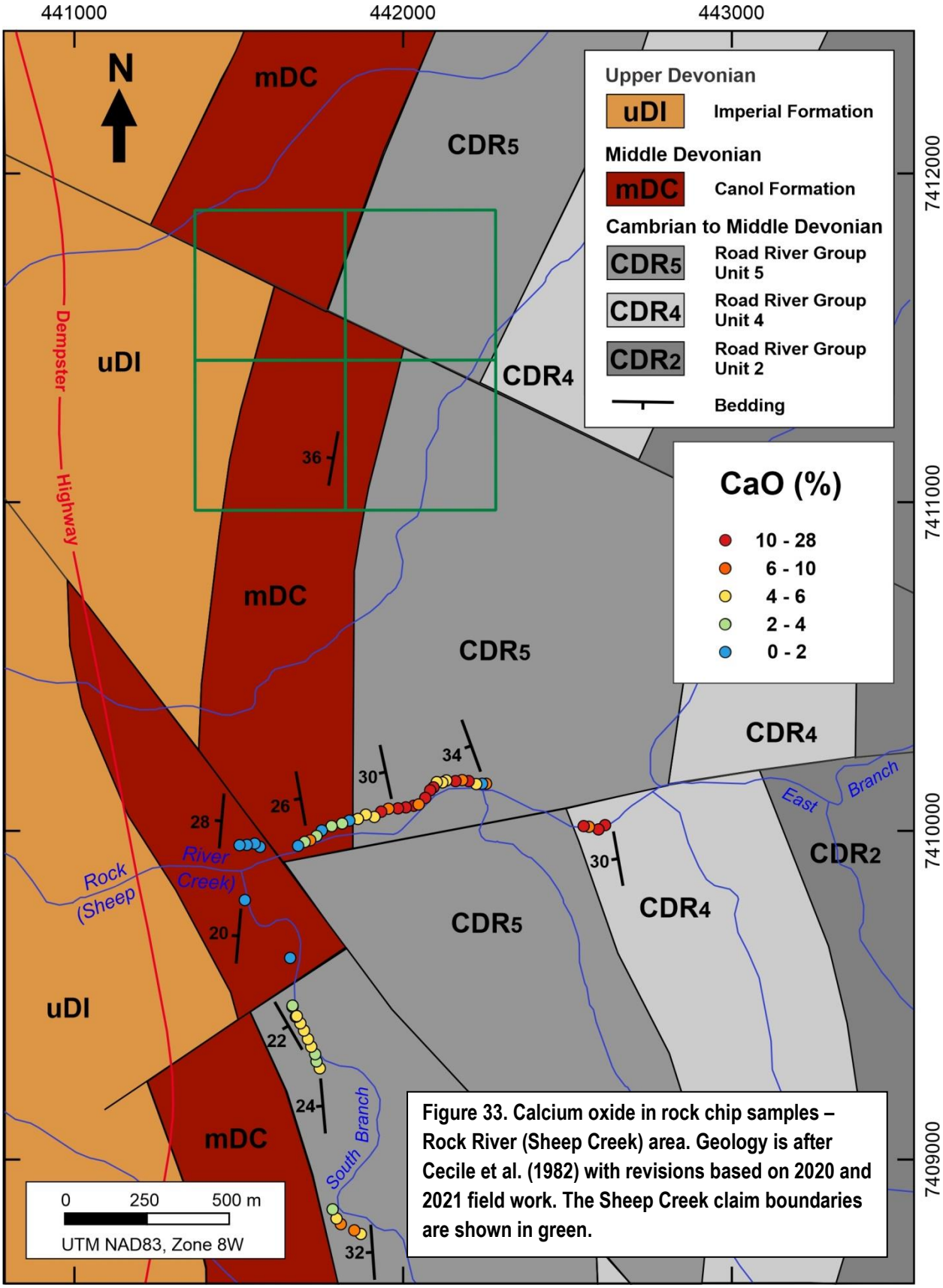


Figure 33. Calcium oxide in rock chip samples – Rock River (Sheep Creek) area. Geology is after Cecile et al. (1982) with revisions based on 2020 and 2021 field work. The Sheep Creek claim boundaries are shown in green.

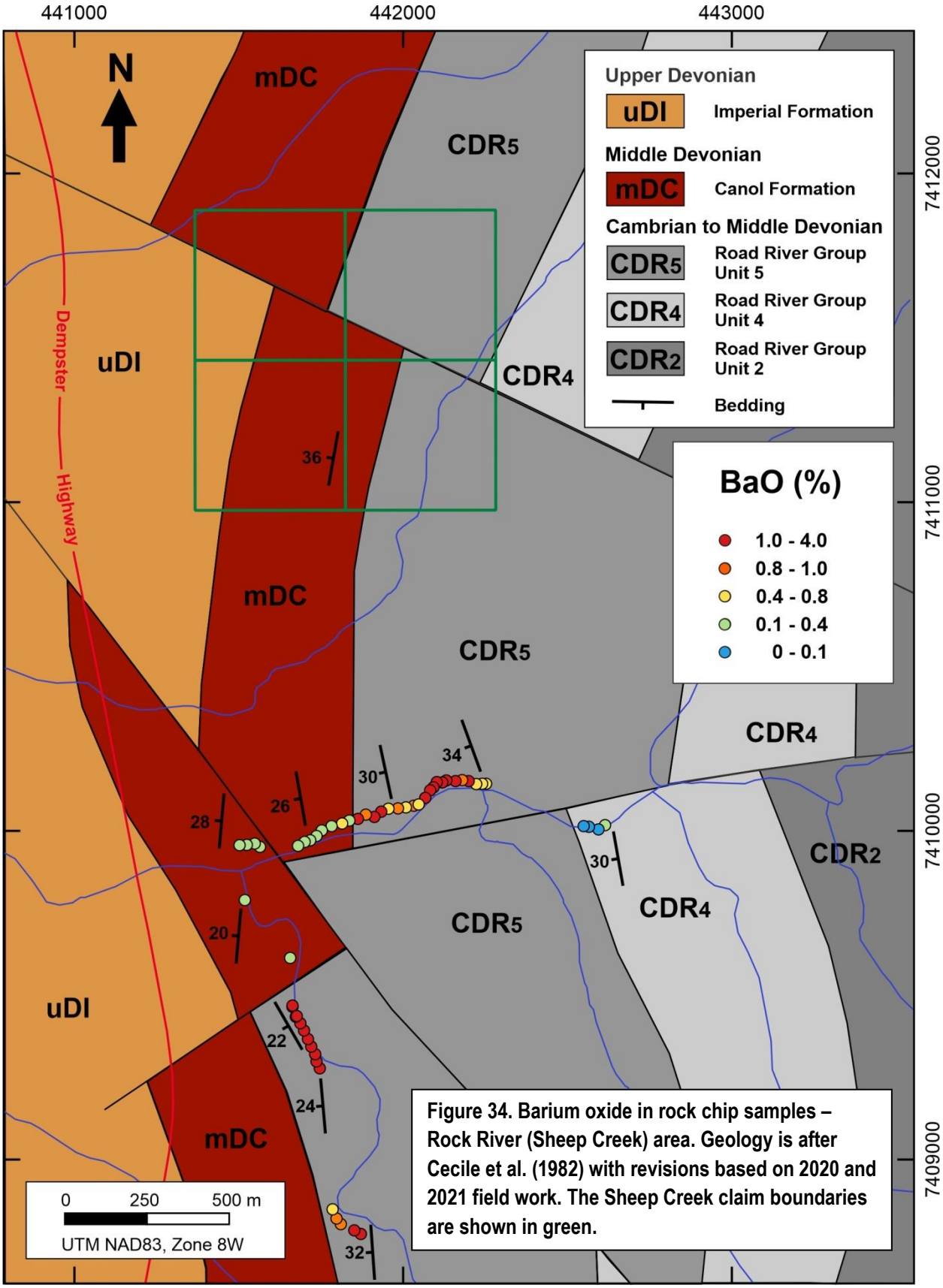


Figure 34. Barium oxide in rock chip samples – Rock River (Sheep Creek) area. Geology is after Cecile et al. (1982) with revisions based on 2020 and 2021 field work. The Sheep Creek claim boundaries are shown in green.

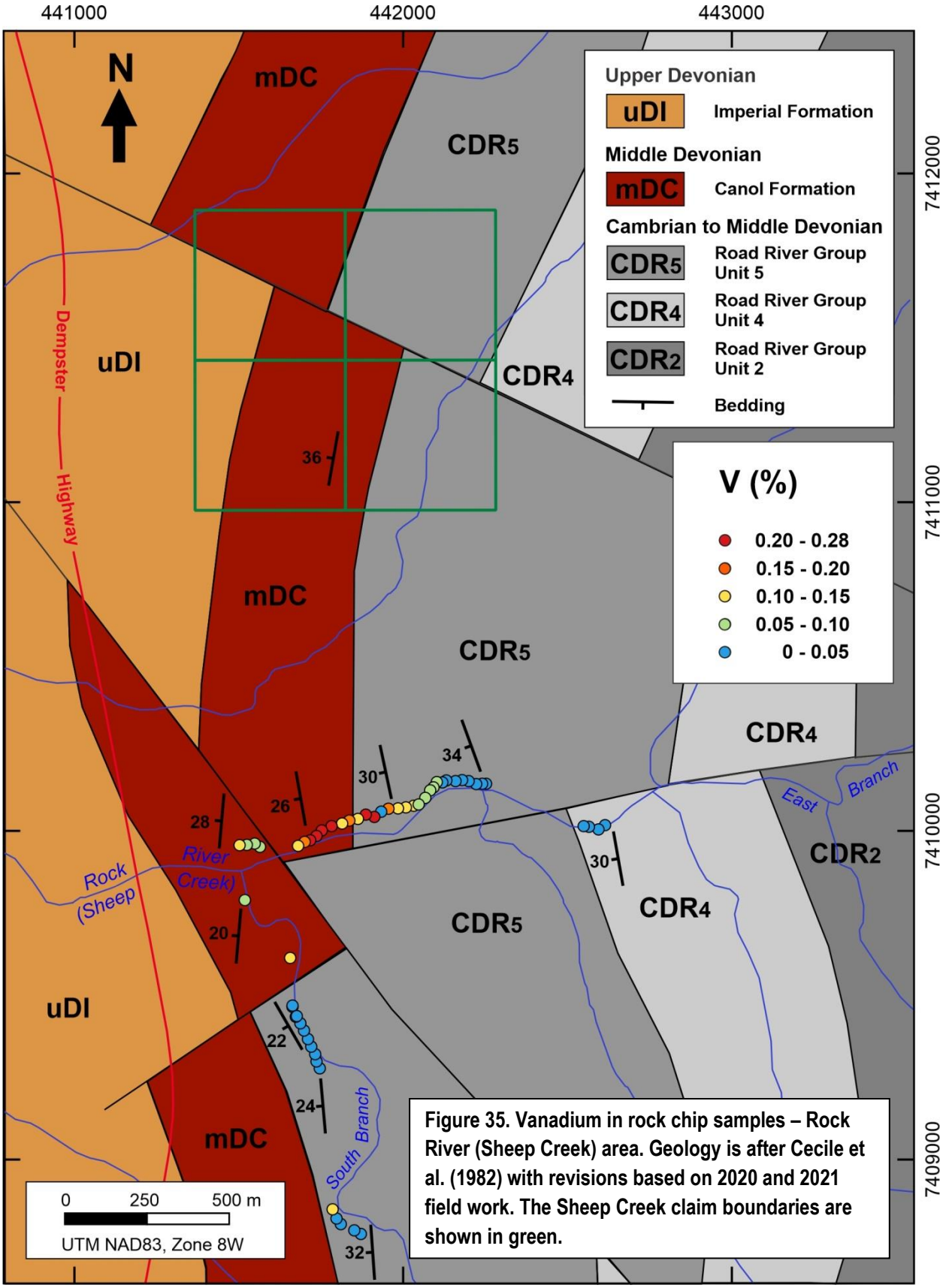


Figure 35. Vanadium in rock chip samples – Rock River (Sheep Creek) area. Geology is after Cecile et al. (1982) with revisions based on 2020 and 2021 field work. The Sheep Creek claim boundaries are shown in green.

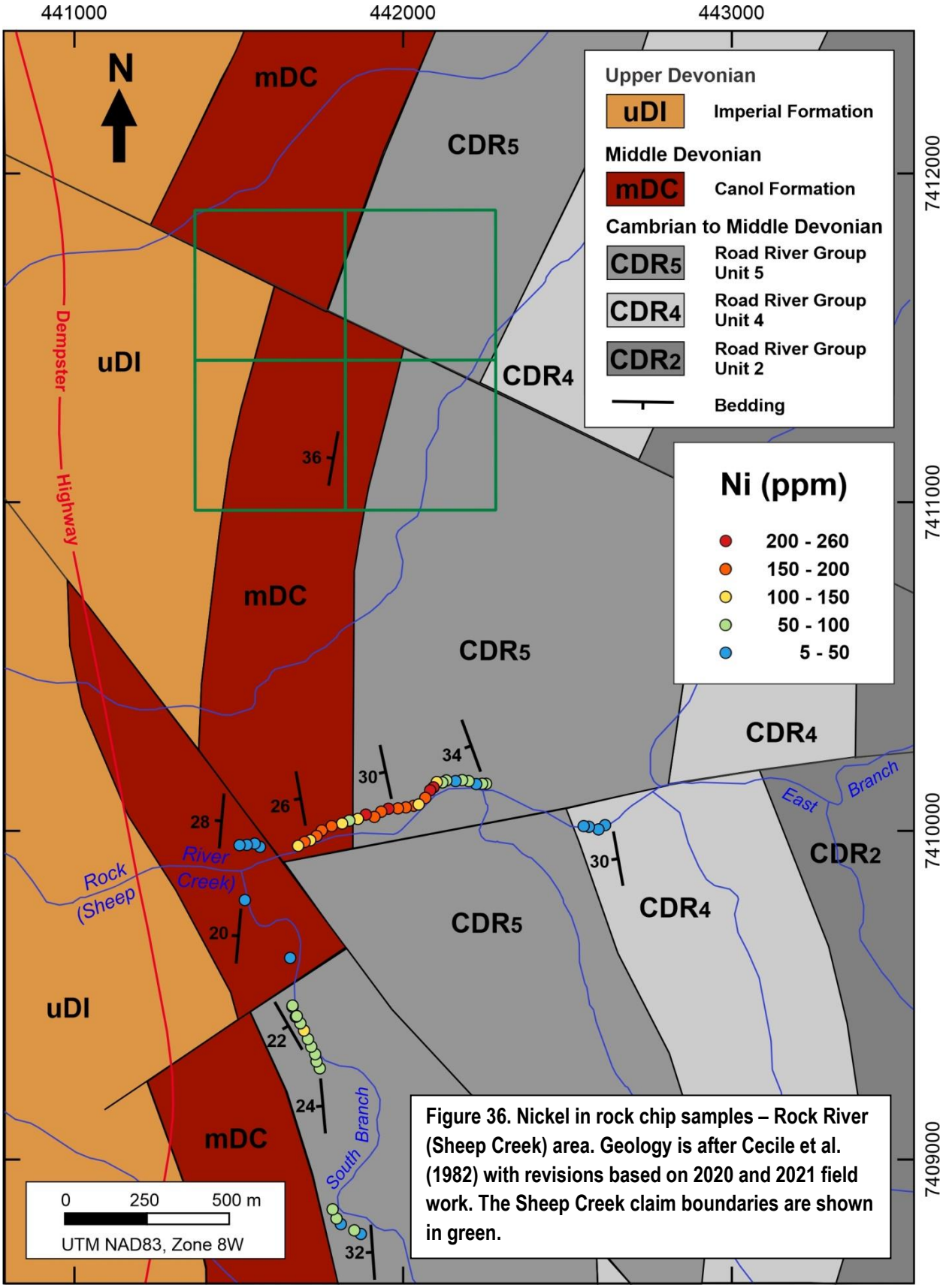


Figure 36. Nickel in rock chip samples – Rock River (Sheep Creek) area. Geology is after Cecile et al. (1982) with revisions based on 2020 and 2021 field work. The Sheep Creek claim boundaries are shown in green.

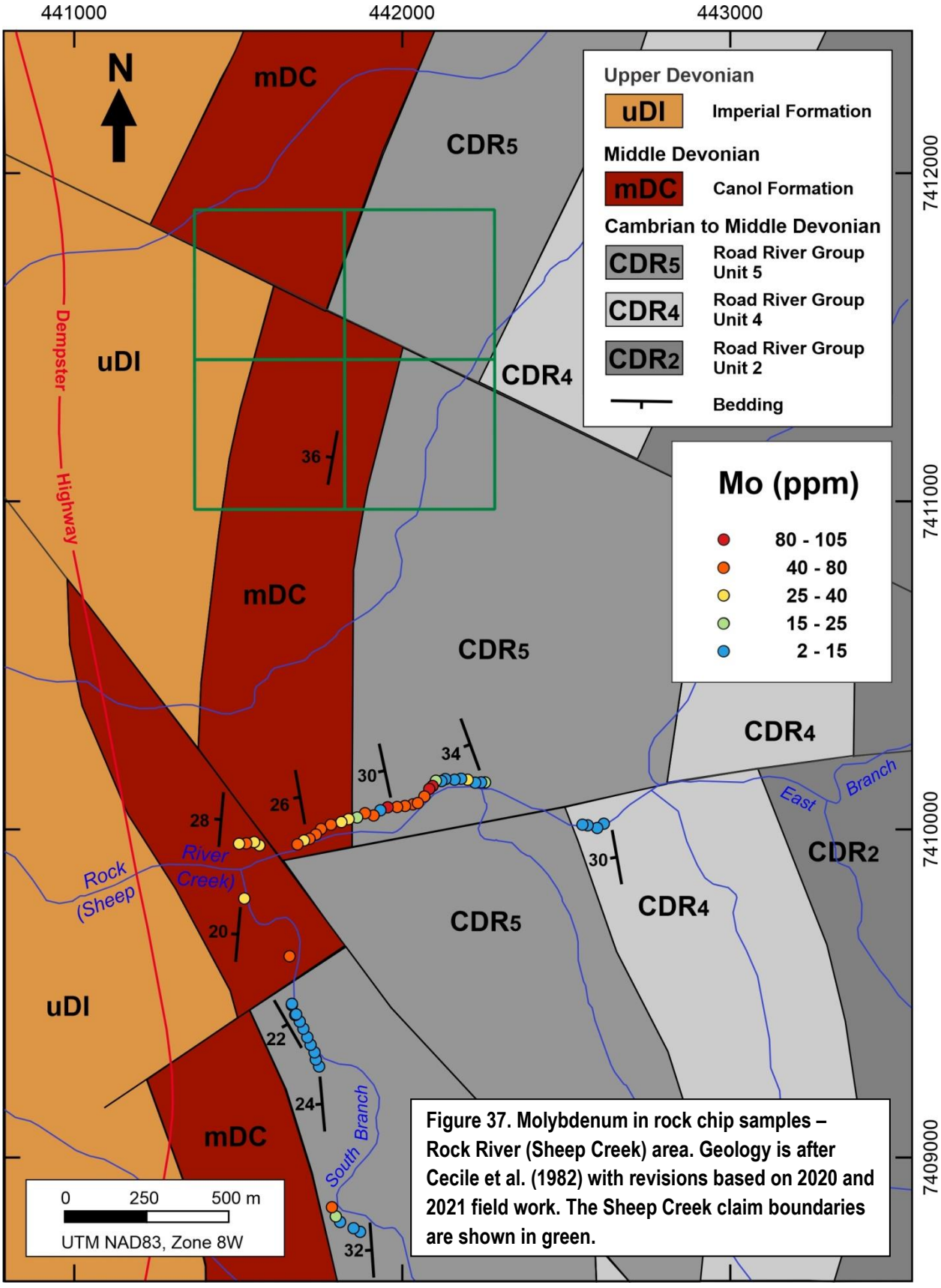


Figure 37. Molybdenum in rock chip samples – Rock River (Sheep Creek) area. Geology is after Cecile et al. (1982) with revisions based on 2020 and 2021 field work. The Sheep Creek claim boundaries are shown in green.

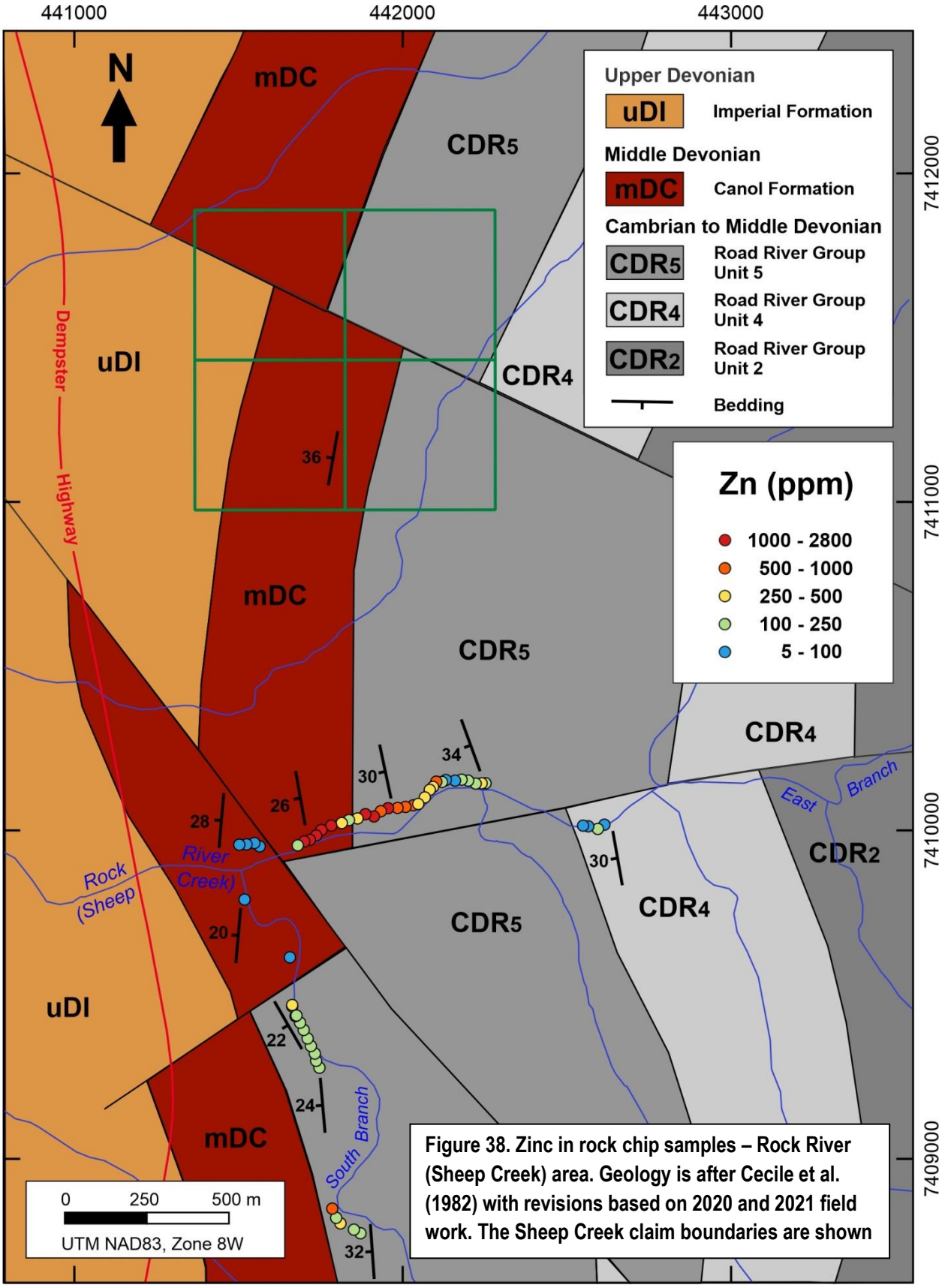


Figure 38. Zinc in rock chip samples – Rock River (Sheep Creek) area. Geology is after Cecile et al. (1982) with revisions based on 2020 and 2021 field work. The Sheep Creek claim boundaries are shown

Soil and Scree Samples

Thirty-eight soil and scree samples were collected in 2021 along two Sheep Creek property traverses (Figure 39). Chert scree fragments were commonly observed at sites along the southern traverse and near the western end of the northern traverse. The southern traverse was terminated at its eastern end near the top of a steep talus slope descending eastward into a narrow stream valley. High metal values characterize the samples at the western end of the northern traverse and it is probable that this traverse did not span the entire mineralized interval.

Vanadium (Figure 40)

- Southern Traverse: The samples from the seven most easterly sites (RM1269 to RM1275), collected over a distance of 150 m, returned an average of 2242 ppm V (4003 ppm V_2O_5). Within this interval the five most easterly samples, collected over a distance of 104 m, returned an average of 2597 ppm V (4636 ppm V_2O_5).

  It is informative to compare these results to those obtained from the bedrock section that spans the Road River Group – Canol Formation contact along the Rock River (Sheep Creek) about 1.4 km to the south:
  - an average of 2100 ppm V (3700 ppm V_2O_5) for samples collected over 225 m, and
  - an average of 2700 ppm V (4800 ppm V_2O_5) for samples collected over 55 m.

  These data suggest that the vanadium values obtained from bedrock and the values obtained from overlying soil and scree samples are similar.

- Northern Traverse: The samples collected from the four most westerly sites (RM1349 to RM1352), collected over a distance of 80 m, returned an average of 1681 ppm V (3001 ppm V_2O_5).

Nickel (Figure 41)

- Southern Traverse: The samples from the seven most easterly sites (RM1269 to RM1275), collected over a distance of 150 m, returned an average of 275 ppm Ni. The highest value obtained was 916.7 ppm Ni.
- Northern Traverse: The samples collected from the four most westerly sites (RM1349 to RM1352), collected over a distance of 80 m, returned an average of 111 ppm Ni.

Molybdenum (Figure 42)

- Southern Traverse: The samples from the four most easterly sites (RM1272 to RM1275), collected over a distance of 83 m, returned an average of 91 ppm Mo.
- Northern Traverse: The sample with the highest Mo value from this traverse, collected from the second most westerly site, returned 51.4 ppm Mo.

Zinc (Figure 43)

- Southern Traverse: The samples from the seven most easterly sites (RM1269 to RM1275), collected over a distance of 150 m, returned an average of 952 ppm Zn with a maximum value of 2168 ppm Zn.
- Northern Traverse: The samples collected from the four most westerly sites (RM1349 to RM1352), collected over a distance of 80 m, returned an average of 984 ppm Zn with a maximum value of 1598 ppm Zn.

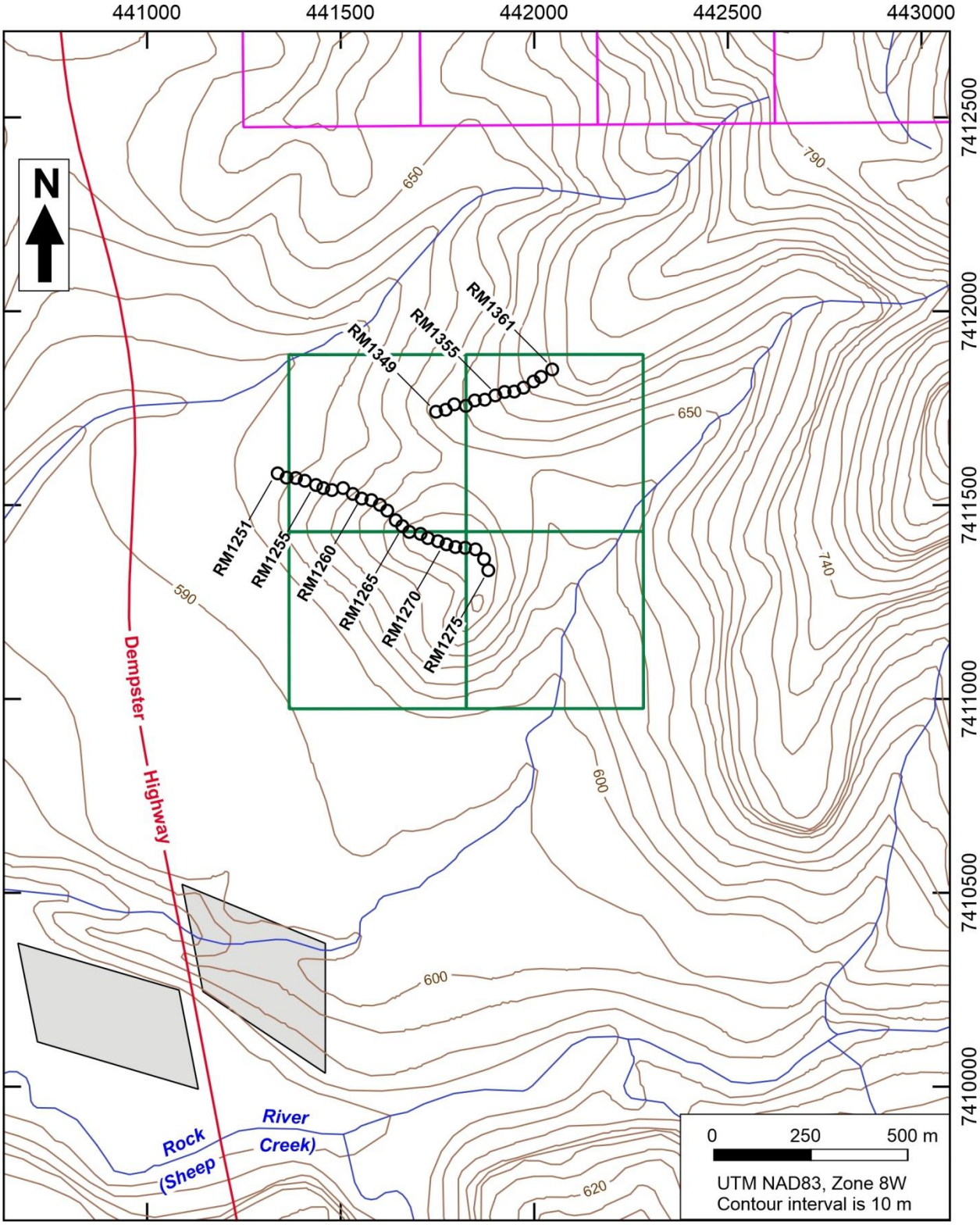


Figure 39. Location of soil and scree sample sites in the Sheep Creek property area. Sample numbers are sequential between labelled sites. Sheep Creek (SC) claim boundaries shown in green. Other claims boundaries shown in magenta. First Nation Settlement Land shown in grey.

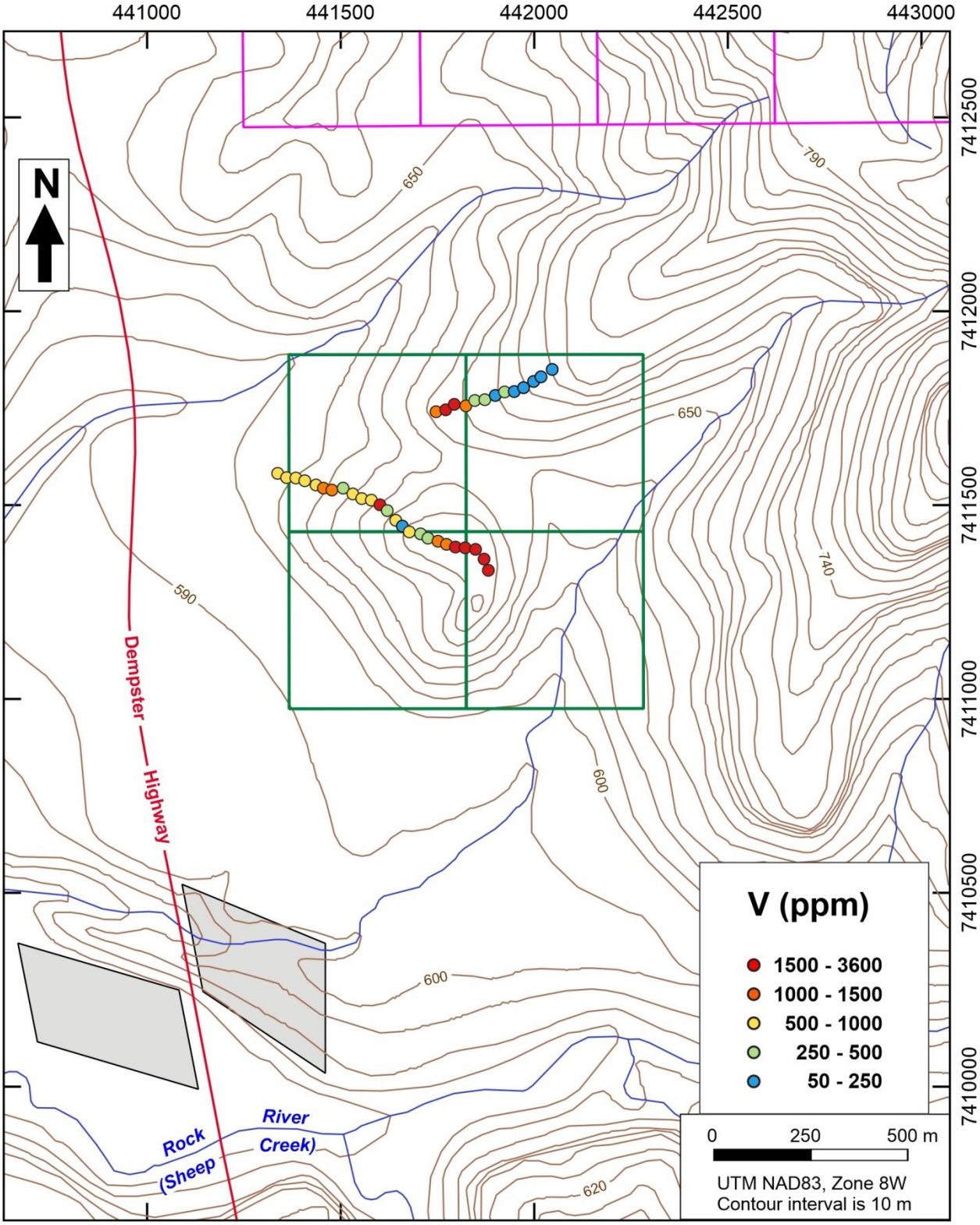


Figure 40. Vanadium in soil and scree samples in the Sheep Creek property area. Sheep Creek (SC) claim boundaries shown in green. Other claims boundaries shown in magenta. First Nation Settlement Land shown in grey.

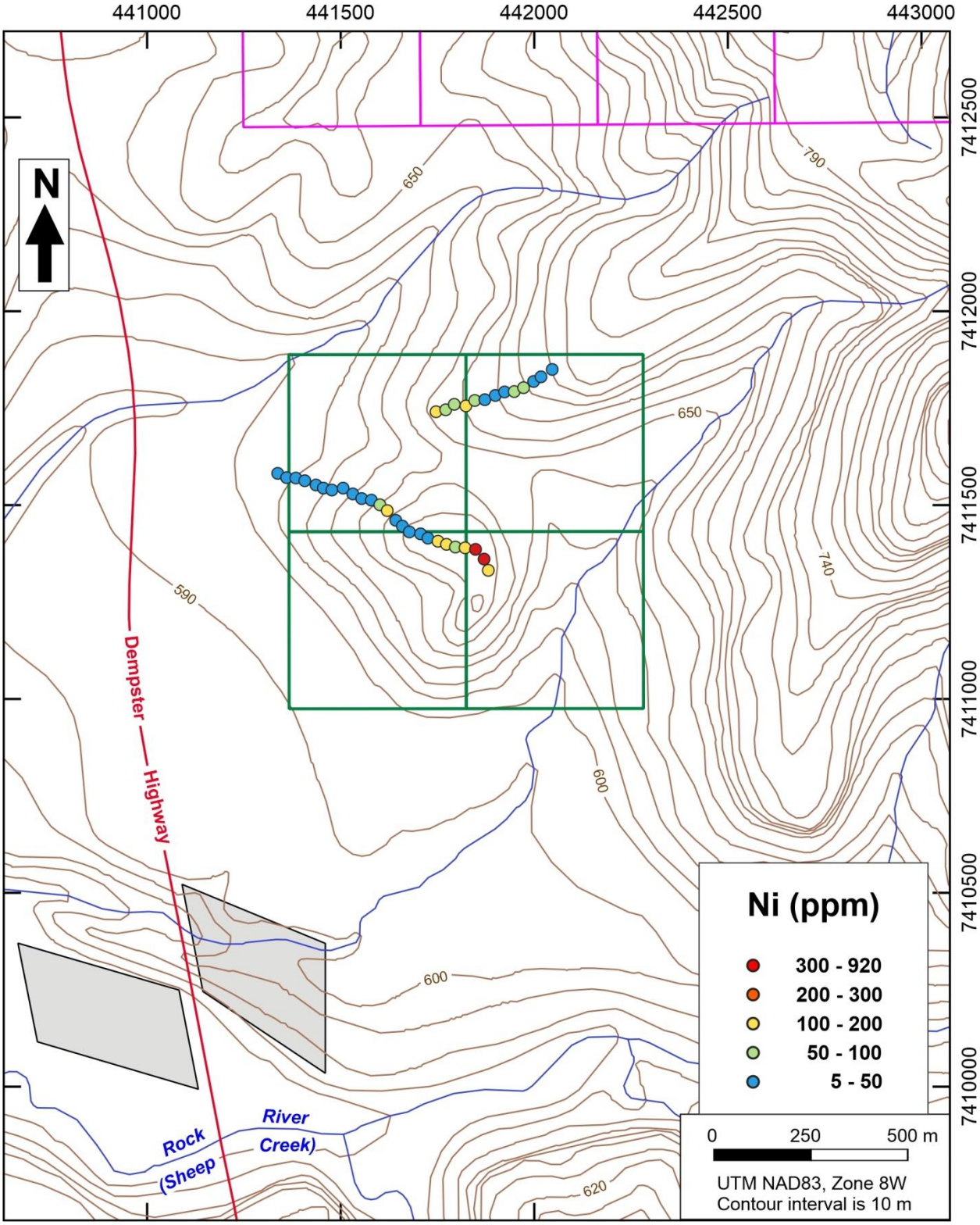


Figure 41. Nickel in soil and scree samples in the Sheep Creek property area. Sheep Creek (SC) claim boundaries shown in green. Other claims boundaries shown in magenta. First Nation Settlement Land shown in grey.

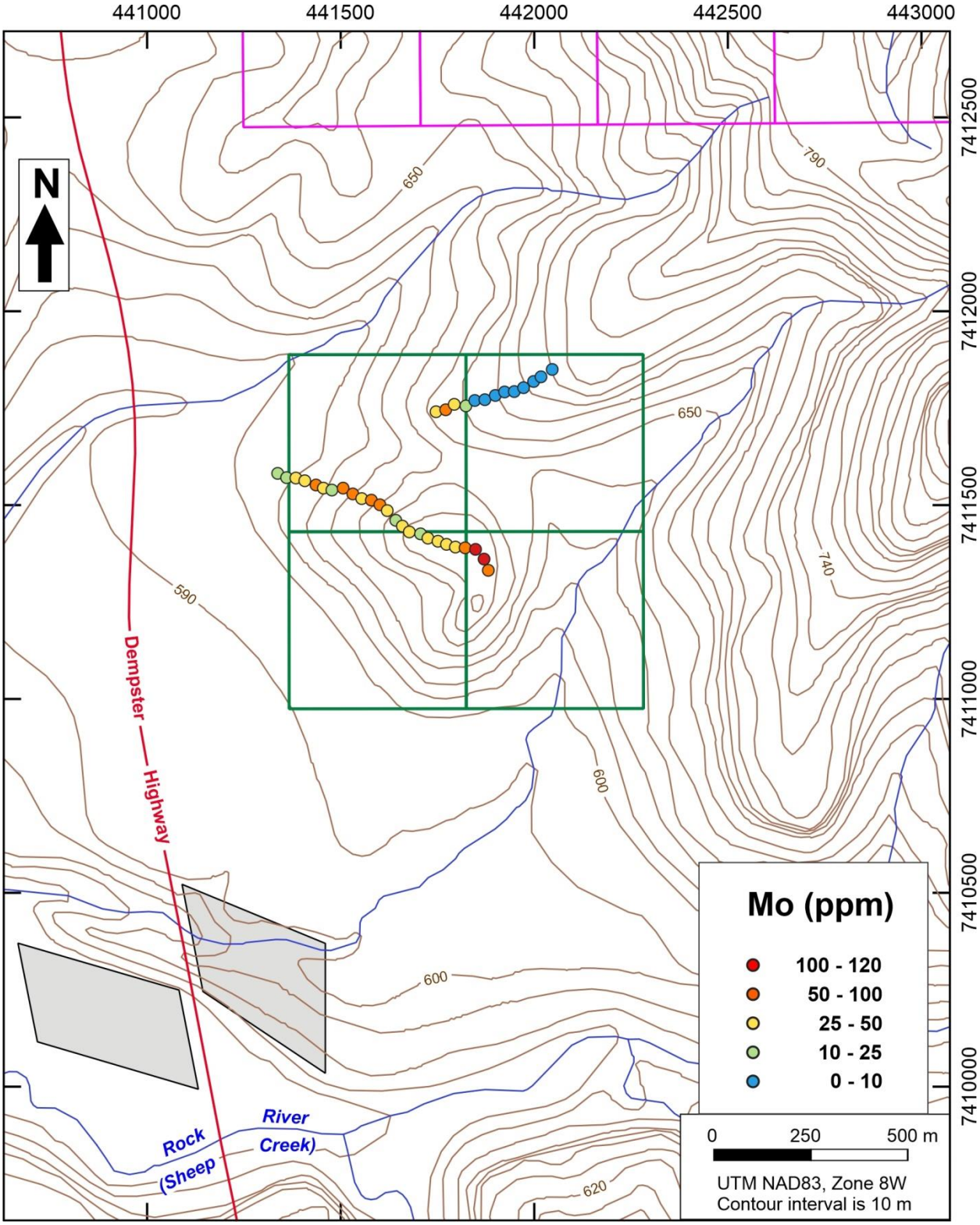


Figure 42. Molybdenum in soil and scree samples in the Sheep Creek property area. Sheep Creek (SC) claim boundaries shown in green. Other claims boundaries shown in magenta. First Nation Settlement Land shown in grey.

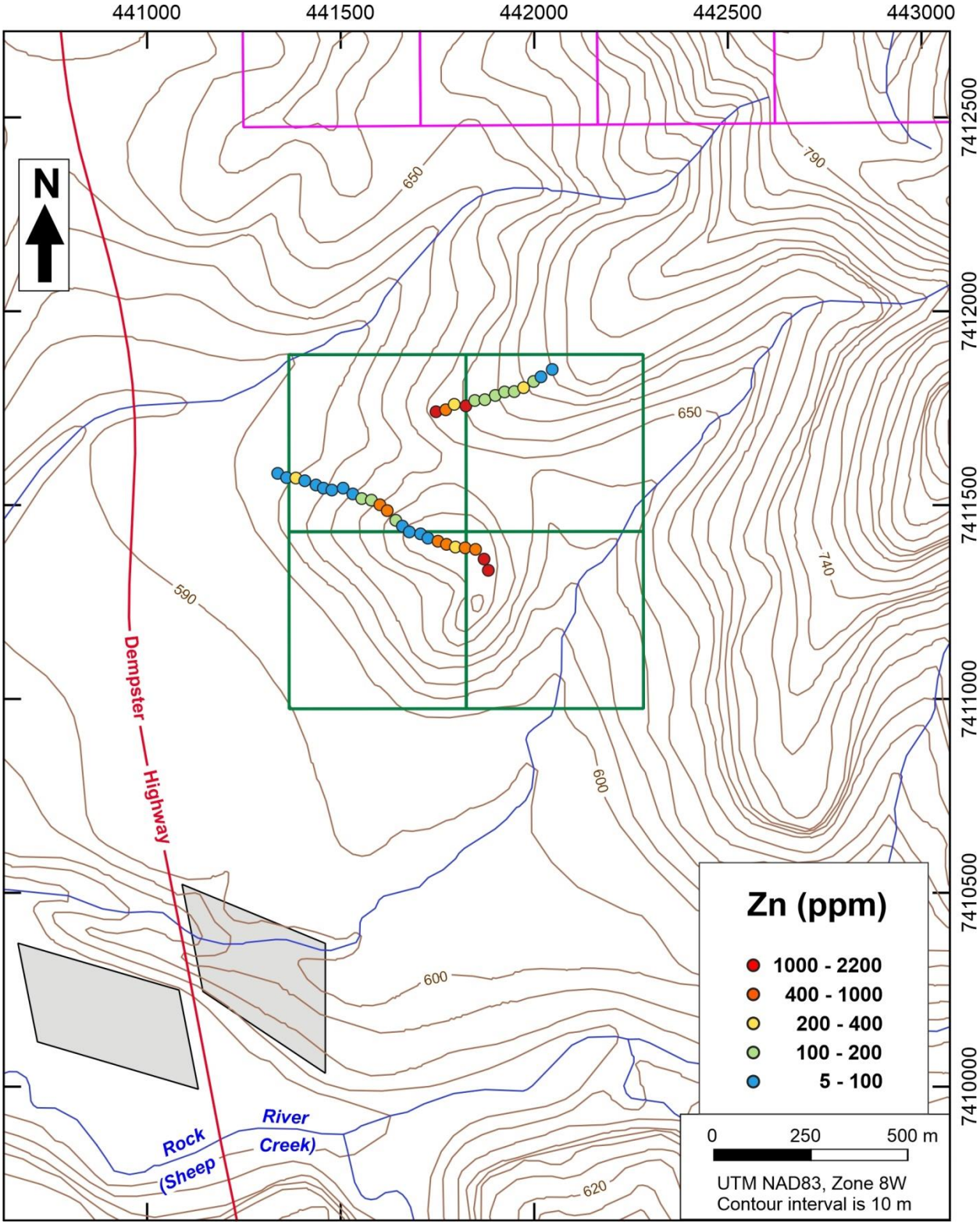


Figure 43. Zinc in soil and scree samples in the Sheep Creek property area. Sheep Creek (SC) claim boundaries shown in green. Other claims boundaries shown in magenta. First Nation Settlement Land shown in grey.

Mount Hare Property Area

Mount Hare Property Description

The Mount Hare property, a group of 30 quartz claims (MH 1 to MH 30) staked in 2020 and 2021, is centred about 900 m east of the Dempster Highway in the drainage areas of Vichi Tik Tsiivii Creek and Vyah Kit Creek (Eagle River tributaries) about 4 km west-southwest of Mount Hare in NTS map area 116I/09 (Table 10, Figure 44). The claims are registered in the Dawson Mining District to Glen Prior.

Property	Claim Name	Tag Number	Recording Date
Mount Hare	MH 1	YF74701	2020-08-28
	MH 2	YF74702	2020-08-28
	MH 3	YF74703	2020-08-28
	MH 4	YF74704	2020-08-28
	MH 5	YF74705	2020-08-28
	MH 6	YF74706	2020-08-28
	MH 7	YF74707	2020-08-28
	MH 8	YF74708	2020-08-28
	MH 9	YF74709	2020-08-28
	MH 10	YF74710	2020-08-28
	MH 11	YF74641	2021-09-20
	MH 12	YF74642	2021-09-20
	MH 13	YF74643	2021-09-20
	MH 14	YF74644	2021-09-20
	MH 15	YF74645	2021-09-20
	MH 16	YF74646	2021-09-20
	MH 17	YF74647	2021-09-20
	MH 18	YF74648	2021-09-20
	MH 19	YF74649	2021-09-20
	MH 20	YF74650	2021-09-20
	MH 21	YF74651	2021-09-20
	MH 22	YF74652	2021-09-20
	MH 23	YF74653	2021-09-20
	MH 14	YF74654	2021-09-20
	MH 25	YF74655	2021-09-20
	MH 26	YF74656	2021-09-20
	MH 27	YF74657	2021-09-20
	MH 28	YF74658	2021-09-20
	MH 29	YF74659	2021-09-20
	MH 30	YF74660	2021-09-20

Table 10. Mount Hare property (MH claims) – claim list.

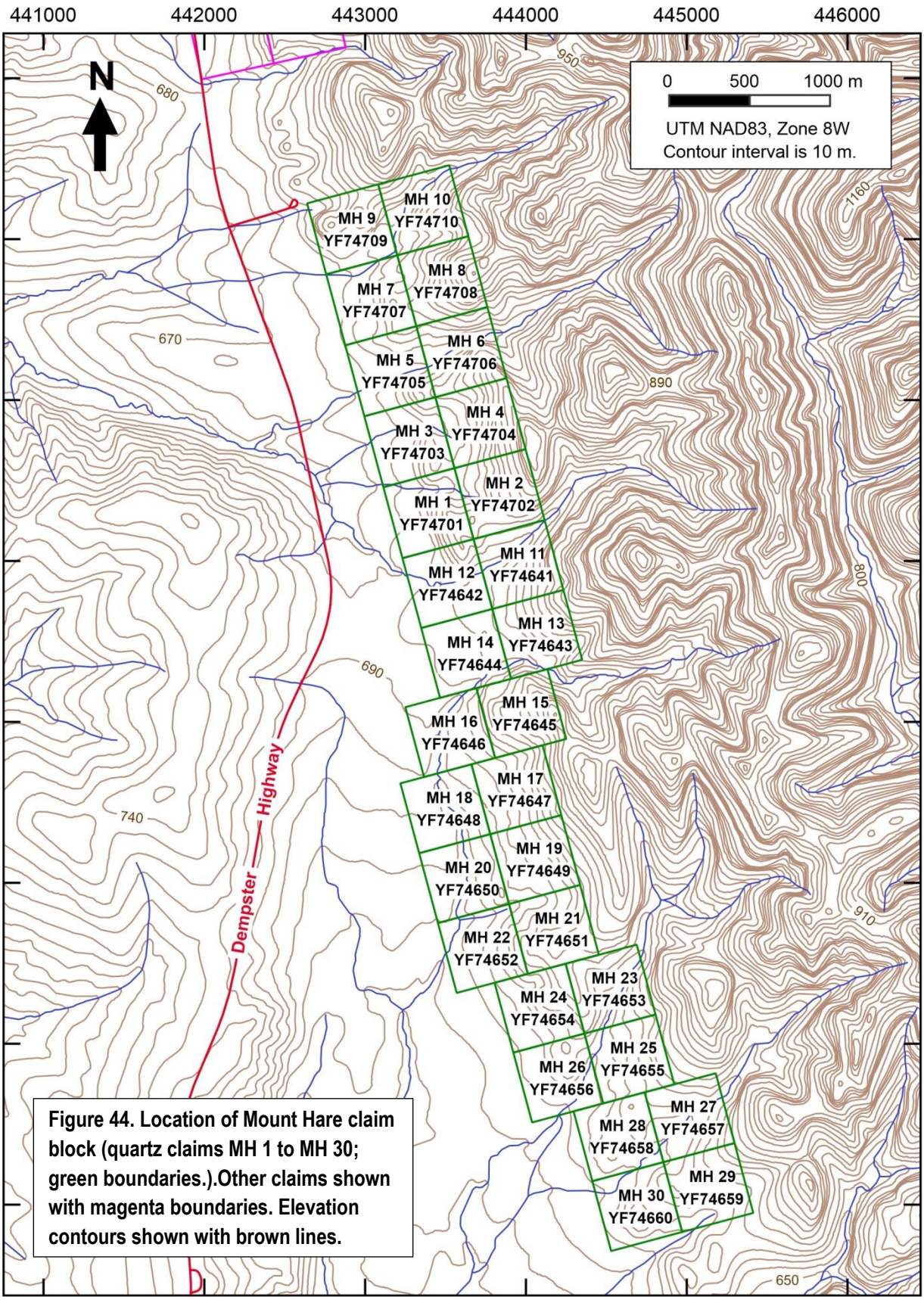


Figure 44. Location of Mount Hare claim block (quartz claims MH 1 to MH 30; green boundaries.).Other claims shown with magenta boundaries. Elevation contours shown with brown lines.

Geology

The Mount Hare property was staked to cover the north-northwest trending Road River Group – Canol Formation contact, known to be a favourable stratigraphic level for V-Ni-Mo-Zn mineralization. Regional geological maps of the area are provided by Cecile et al. (1982) and the Yukon Geological Survey (2018; Figure 45). Strata dip at moderate angles to the west.

Several outcrops were encountered during sampling traverses in the Mount Hare property area and these were examined and described (Appendix 1). These observations along with descriptions of scree made during traverses, soil/scree geochemical data, and topographic characteristics have been used to reposition Canol Formation contacts in the area (Figure 46) from the locations shown by Cecile et al, (1982) and Yukon Geological Survey (2018); compare Figure 45 with Figure 46).

- Note: Recent workers (e.g. Fraser and Hutchinson, 2017; Gadd et al., 2019; Dumala, 2007c) place the Road River Group – Canol Formation contact at the transition from (i) commonly calcareous shale to (ii) non-calcareous shale and chert. A hyper-enriched black shale (HEBS) layer a few centimetres thick, strongly enriched in Ni, Mo and several other elements, is commonly (but not always) present at the contact (also referred to as the NiMo horizon; e.g. Gadd et al., 2019; Dumala, 2007c). This placement differs somewhat from that of Cecile et al., 1982, who include an upper 0 to 50 interval of white weathering, siliceous shale and chert in their SDv unit below the Canol Formation. In this report the 'recent' definition of the Road River Group – Canol Formation contact is used.

Outcrops of Canol Formation in the Mount Hare property area tend to be small and dominated by black chert. These are typically found near the tops of small knobs along minor ridges. However, nearby scree is commonly dominated by non-calcareous, siliceous (to cherty) shale indicating that predominance of chert in outcrop is due to its resistance to weathering and is not indicative of the unit as a whole.

Outcrops of the Road River Group in the Mount Hare property area commonly consist of calcareous shale (locally grading into shaly limestone). These outcrops occur within unit CDR5 (and possibly CDR4) of the upper Road River Group (Figure 46). Outcrop at the lowest stratigraphic level observed in the Mount Hare property area consists of interbedded chert, limestone and calcareous shale and is assigned to Road River Group unit CDR2 (outcrop at 444632E, 7387286, UTM Zone 8W, NAD 83).

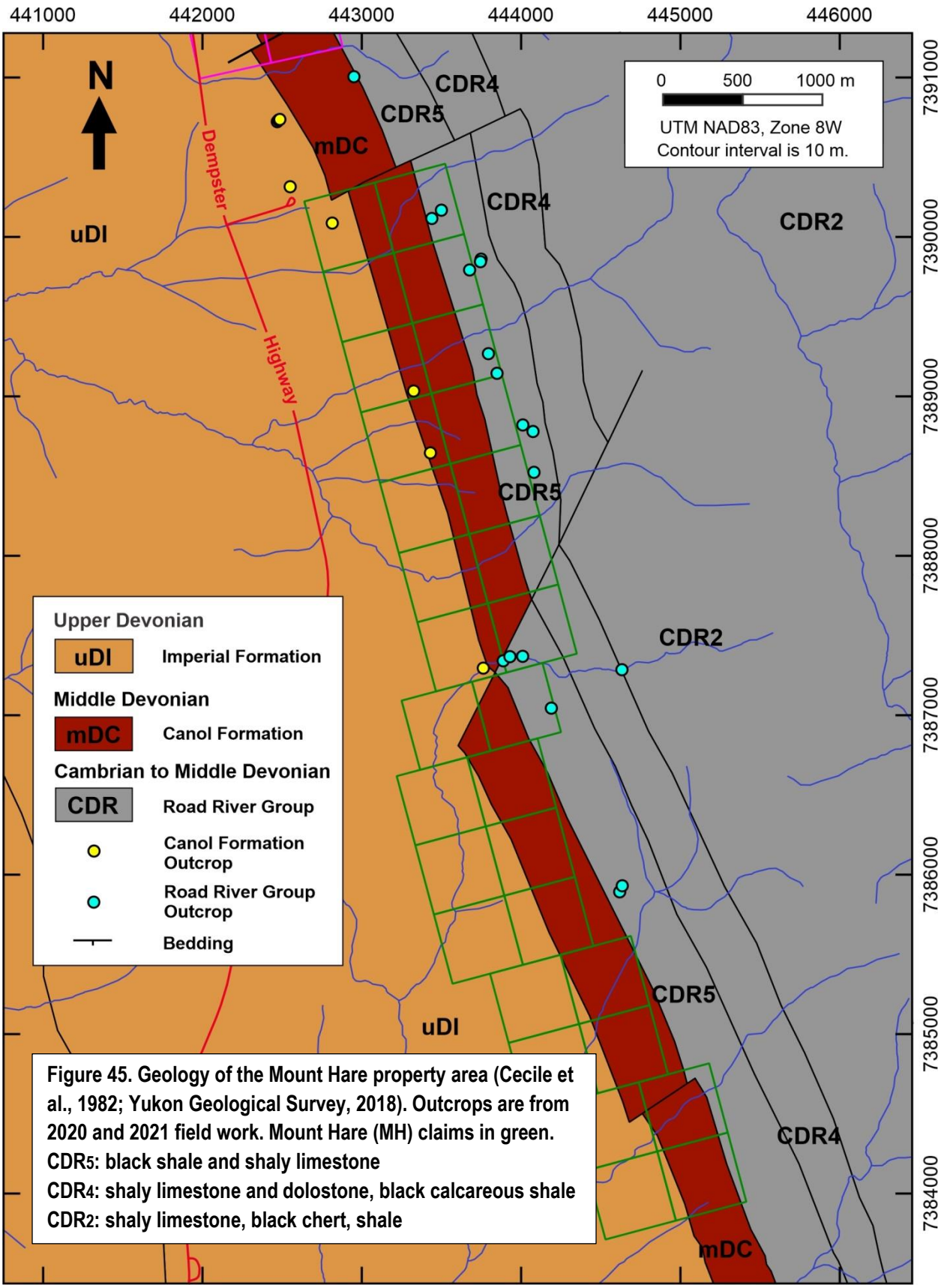


Figure 45. Geology of the Mount Hare property area (Cecile et al., 1982; Yukon Geological Survey, 2018). Outcrops are from 2020 and 2021 field work. Mount Hare (MH) claims in green.
CDR5: black shale and shaly limestone
CDR4: shaly limestone and dolostone, black calcareous shale
CDR2: shaly limestone, black chert, shale

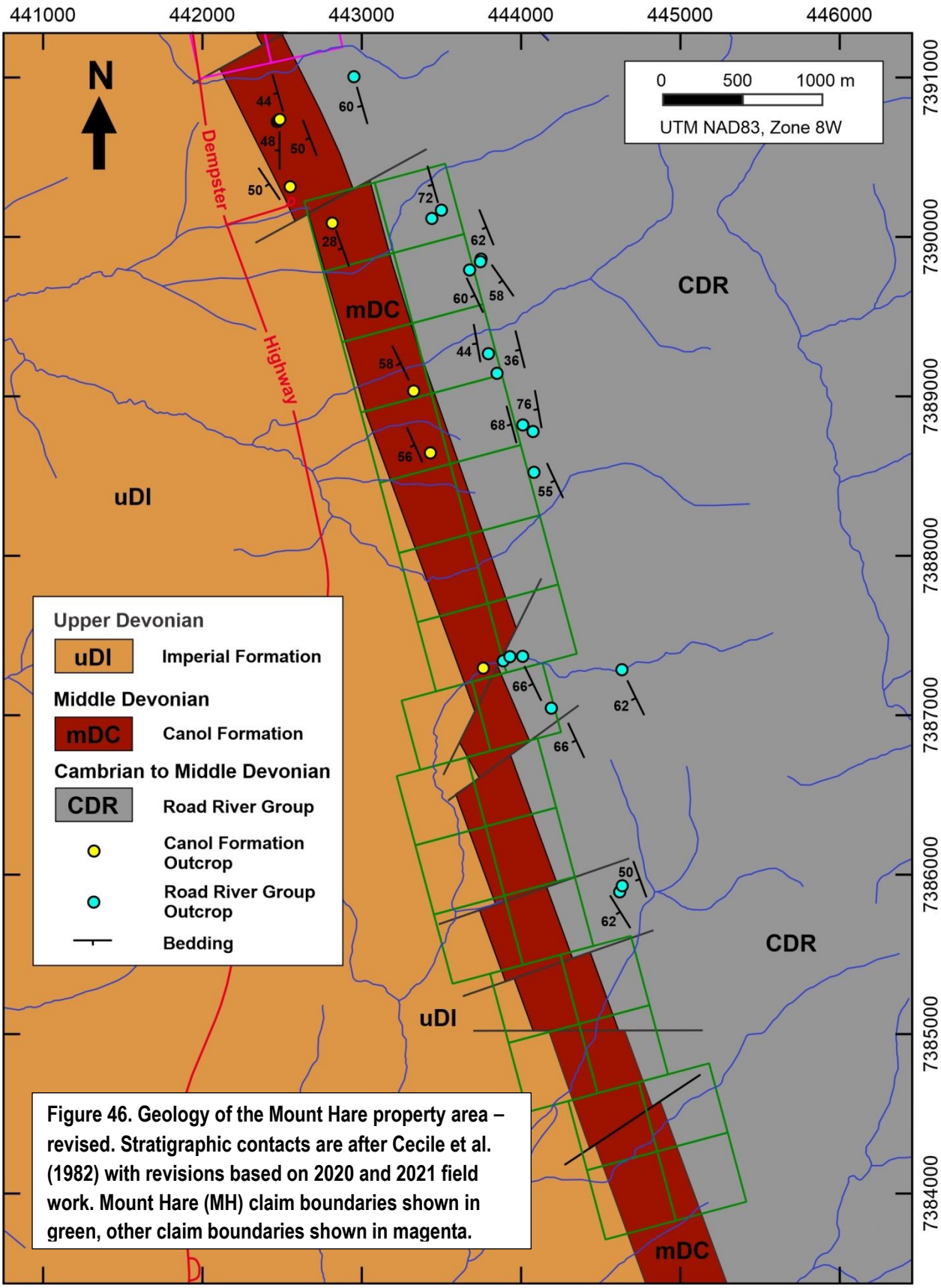


Figure 46. Geology of the Mount Hare property area – revised. Stratigraphic contacts are after Cecile et al. (1982) with revisions based on 2020 and 2021 field work. Mount Hare (MH) claim boundaries shown in green, other claim boundaries shown in magenta.

Stream Sediment (Silt) Samples

Seven stream sediment (silt) samples were collected form the Mount Hare property area in 2020 and another six were collected in 2021 (Figures 47 to 51). These were taken from generally westerly flowing streams draining small to modest catchment areas. The samples contain both stream bottom clastic material and moss mat. The 2020 samples highlighted the anomalous V−Ni−Mo−Zn character of stream sediments near the Road River Group – Canol Formation contact. The 2021 samples form a sequence of samples from a westerly flowing stream near the centre of the Mount Hare property (approximately perpendicular to strike). Including sample RM603 from 2020 there are seven samples from this stream over a distance of 1220 m (average sample site spacing of 244 m). The results from these seven samples demonstrate very high metal contents near the Road River Group – Canol Formation contact (up to 549 ppm V, 74.6 ppm Ni, 10.5 ppm No and 676 ppm Zn) . However, upstream sites also returned elevated metal values with the highest values from the easternmost sample site (sample RM1601; 346 ppm V, 47.2 ppm Ni, 7.7 ppm Mo and 529 ppm Zn). These data suggest another source of metals within the Road River Group stratigraphically well below (east of) the Canol Formation. Cobbles and boulders in the rocky stream bed at sample site RM1601 consist of abundant black, black weathering chert and dark grey, medium grey weathering limestone along with a minor amount of limestone breccia. These rock types are reminiscent of Road River Group unit CDR2.

Sample RM1602, which returned modest metal values, was collected from a small, northerly flowing tributary of the main stream.

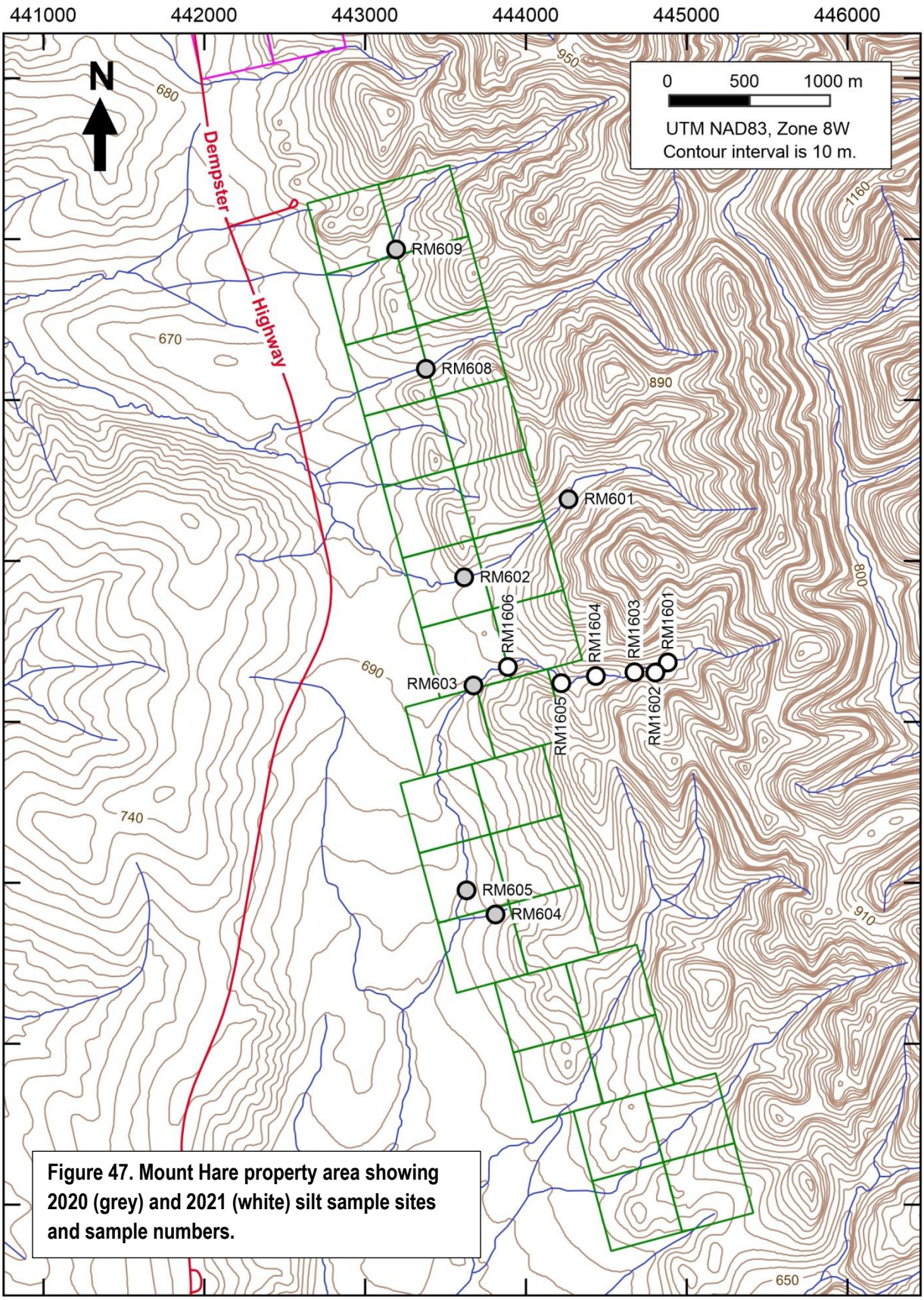


Figure 47. Mount Hare property area showing 2020 (grey) and 2021 (white) silt sample sites and sample numbers.

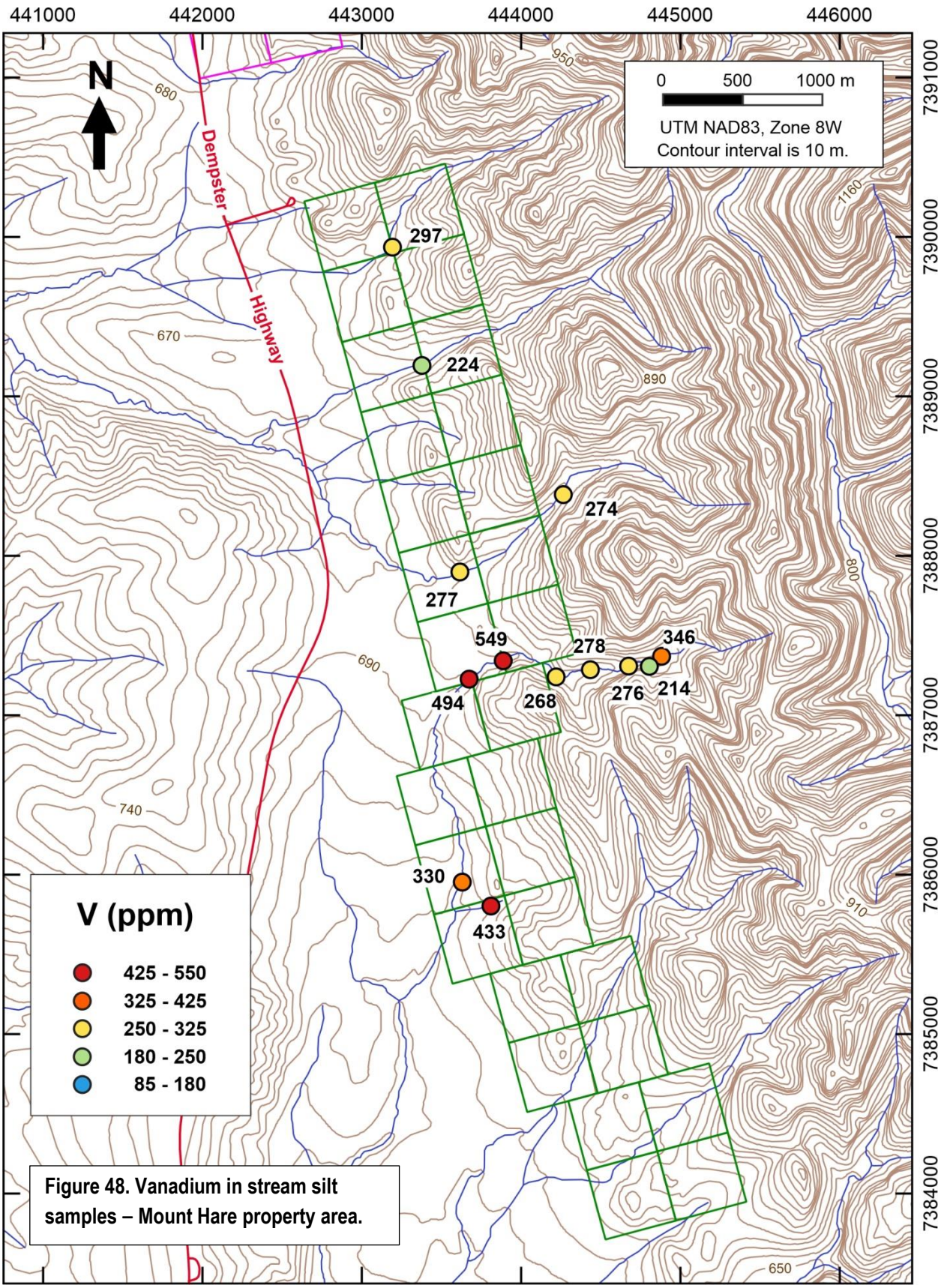


Figure 48. Vanadium in stream silt samples – Mount Hare property area.

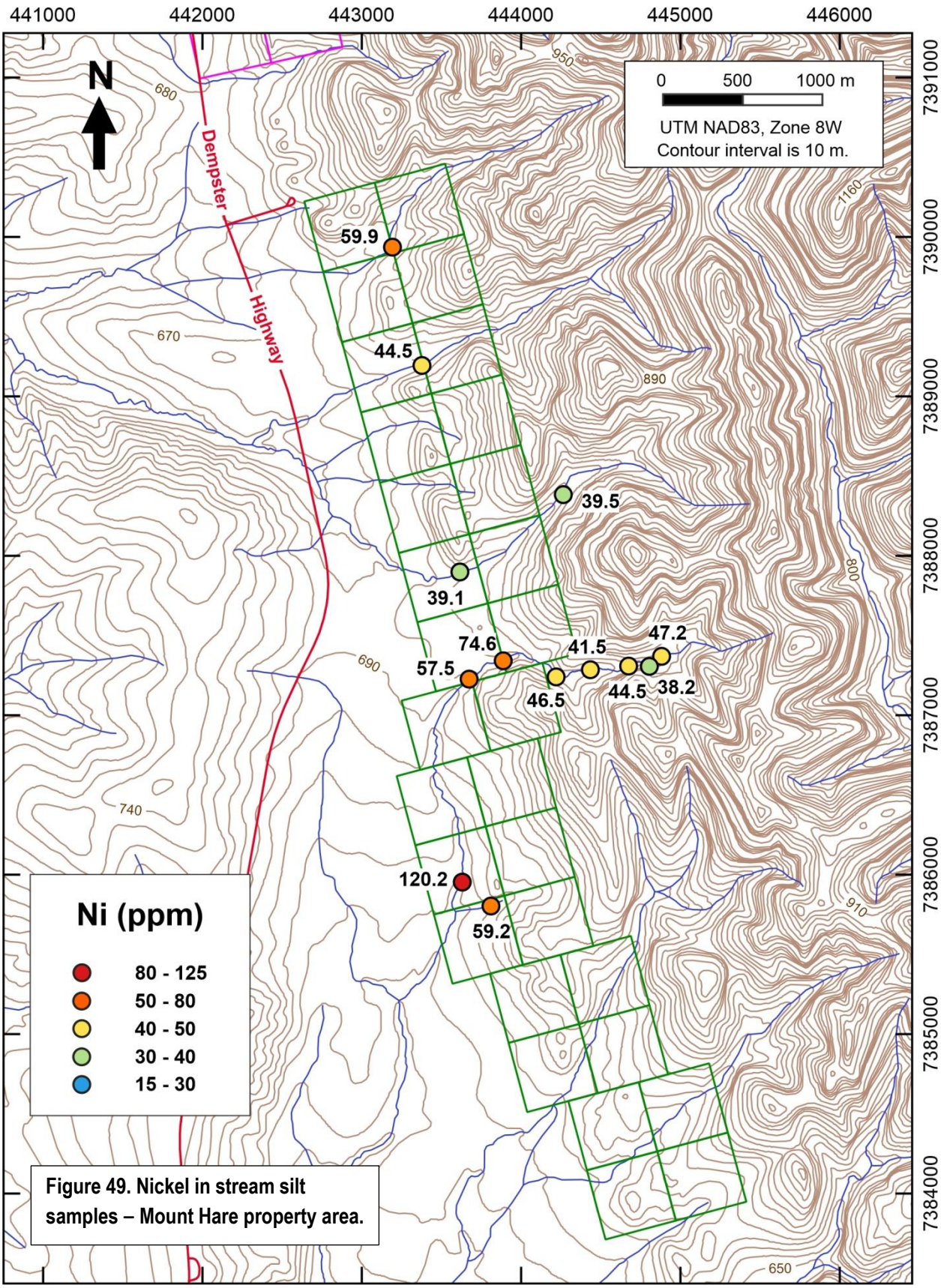


Figure 49. Nickel in stream silt samples – Mount Hare property area.

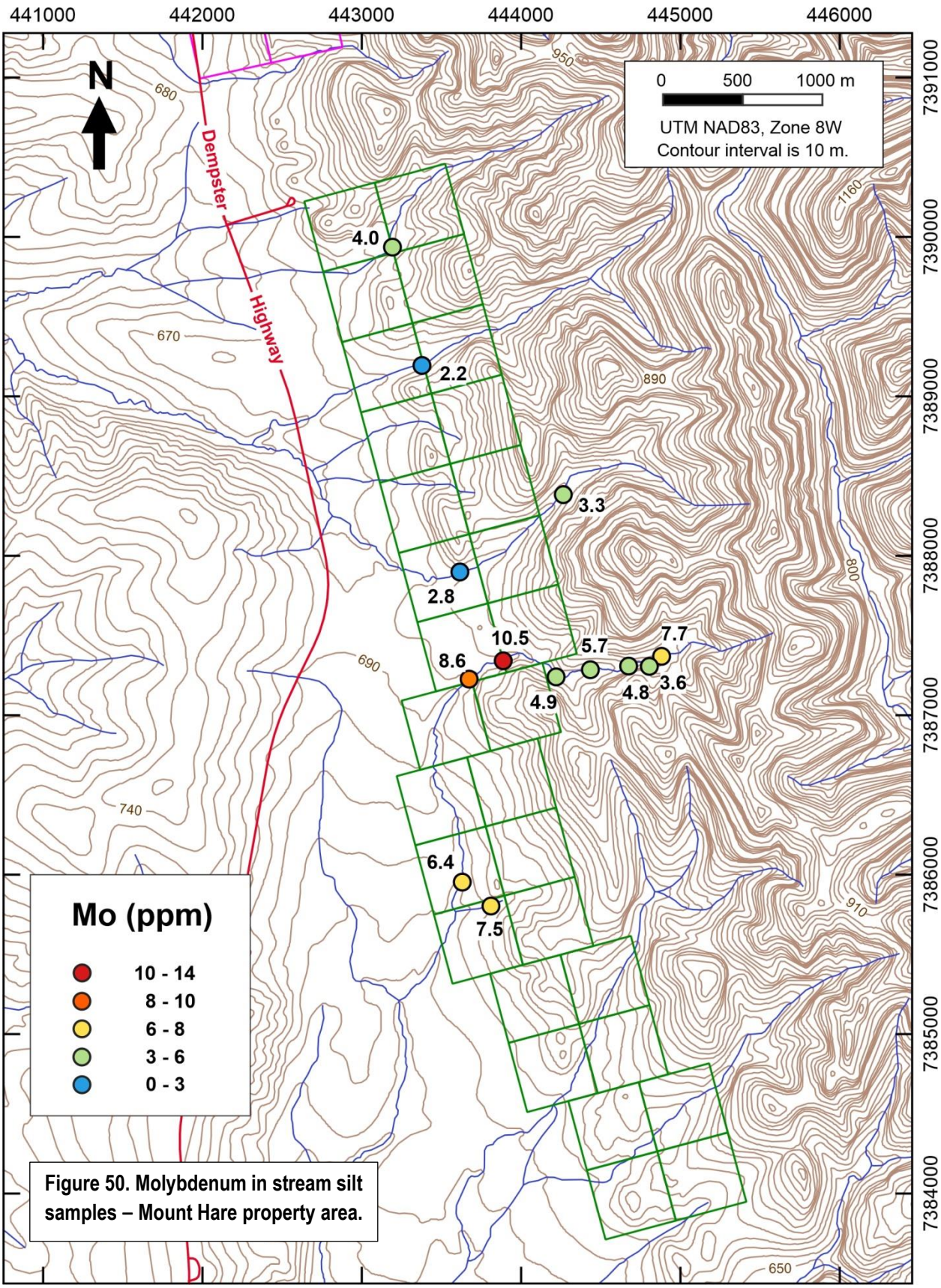


Figure 50. Molybdenum in stream silt samples – Mount Hare property area.

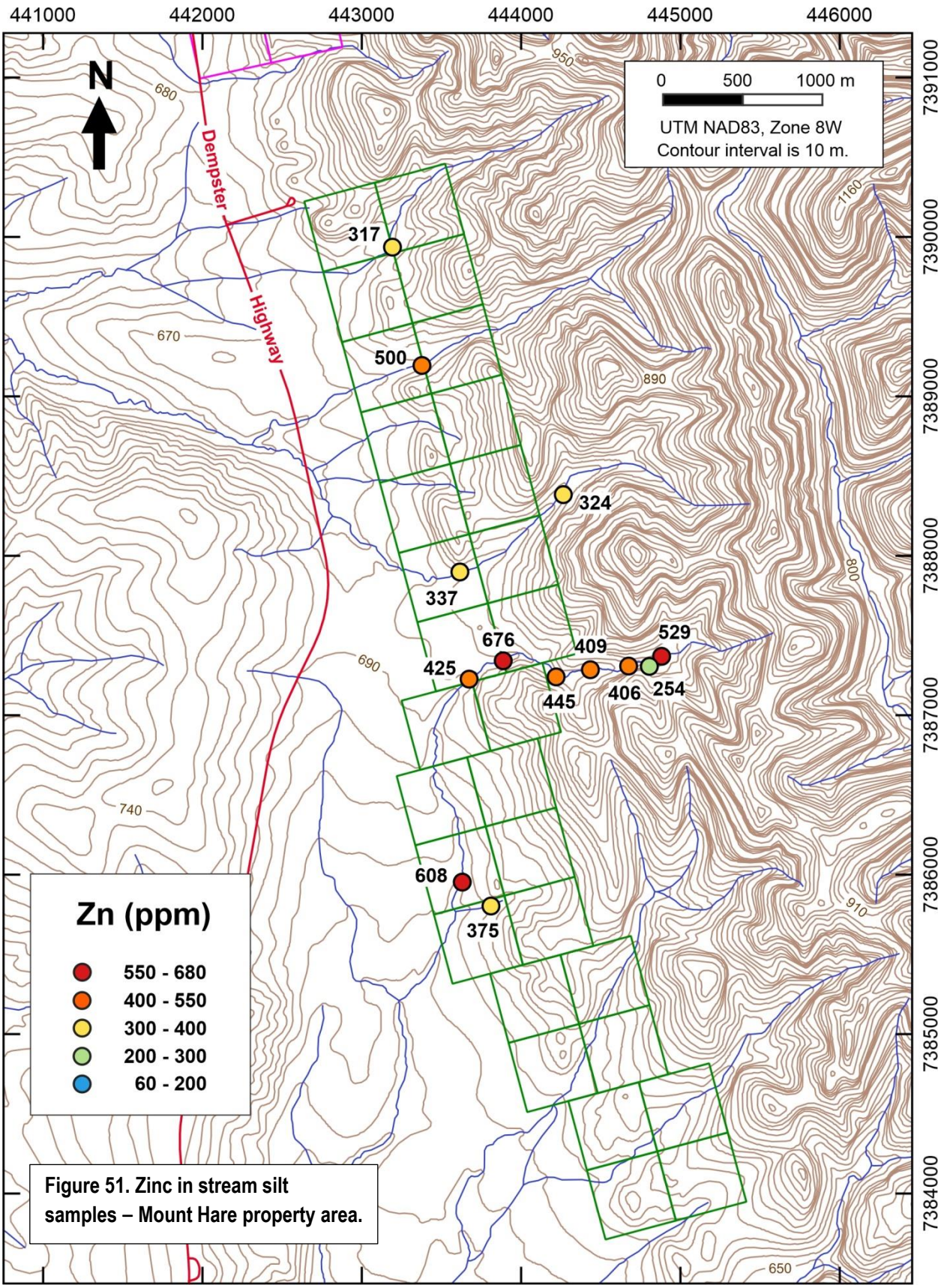


Figure 51. Zinc in stream silt samples – Mount Hare property area.

Soil and Scree Samples

A total of 283 soil and scree samples have been collected from the Mount Hare property area during the WRM project – 160 samples in 2020 and 123 samples in 2021. These samples were collected on ridgeline traverses along generally east-west trending minor ridges (spurs), roughly perpendicular to strike, with a nominal sample spacing of 25 m (Figures 53 to 61). The samples were collected from ten traverses (some of which have local offsets) with the most northerly and most southerly traverses being about 5.7 km apart.

At sites where scree was plentiful the field observations included the reaction of scree fragments to dilute (10%) HCl (to determine the relative carbonate content) and the percentage of scree fragments composed of chert.

Chert is common, but not ubiquitous, within the Canol Formation. However, lower (eastern) stratigraphic levels of the Canol Formation in both the Mount Hare property area and the Sheep Creek property area appears to be dominated by non-calcareous, siliceous shale with little or no chert. Limestone, observed locally in rubble and scree at sites overlying the Canol Formation, is a very minor component.

The upper unit of the Road River Group (unit CDR5) is dominated by calcareous shale with local limestone beds and shale fragments in overlying scree are commonly calcareous. Chert was not observed in scree overlying the upper Road River Group in the Mount Hare property area (or in outcrops of unit CDR5 observed about 20 km north along the Rock River [Sheep Creek]). The appearance of chert in some of the most easterly sample sites east of the Mount Hare property, accompanied by shale and limestone, suggests that these traverses extend eastward (down strata) far enough to overlie Road River Group unit CDR2.

The ten soil and scree sampling traverses are identified by the UTM northing coordinate near the centre of each traverse (Figure 54). Results for each traverse are discussed below (in order from the most northerly traverse to the most southerly traverse).

Figure 52. View of typical Canol Formation scree. Scree is composed of light to medium grey weathering, non-calcareous shale and a minor amount of black weathering chert. Patches of dark grey to black scree are mainly due to black lichen. View is to the west from 443960, 7355696 (about 70 m north of soil/scree sample RM257).

- ***Traverse 7390800N***
    - 11 samples collected in 2020 (RM550–RM560).
    - 12 samples collected in 2021 (RM1310–RM15 and RM1343-RM1348).

    This most northerly traverse lies north of the Mount Hare property. Calcareous scree was observed at the three most easterly sites and chert was observed at four sites in the western part of the traverse. Small outcrops of siliceous shale and chert were observed along western part of the traverse and a large outcrop of calcareous shale was observed about 125 m east of the eastern limit to the sampling traverse. These observations combined with a pronounced contrast in Ba geochemistry indicate that Road River Group – Canol Formation contact lies near the centre of the traverse.

    One sample collected along this traverse (RM558) contains significantly elevated metal values including 3205 ppm V (5722 ppm V_2O_5), 184.9 ppm Ni, 83.4 ppm Mo and 1192 ppm Zn. This sample is most likely from the lowermost Canol Formation.

- ***Traverse 7390100N***
    - 19 samples collected in 2020 (RM531−RM549).
    - 10 samples collected in 2021 (RM1241−RM1250).

    This traverse, across the northernmost claims of the Mount Hare property, is broken into two parts by a stream valley unsuitable for sampling. A small outcrop of interbedded chert and shale occurs along the western part of the traverse and calcareous shale outcrops near the eastern end of the traverse. Chert fragments were observed at 18 out of 19 sites along the western part of the traverse (locally forming up to 50% of the scree). Calcareous scree was noted at two sites along the eastern part of the traverse. Barium is significantly enriched in the eastern part of the traverse compared to the western part. The Road River Group – Canol Formation contact is interpreted to lie in the valley between the two traverse segments.

    Significant metal enrichments are confined to samples from the western segment of the traverse, which is underlain by the Canol Formation. An overall enrichment of vanadium and molybdenum is notable along the entire traverse (values typically >500 ppm V and >50 ppm Mo). In contrast, Ni and Zn are only locally enriched. Maximum sample values include 2991 ppm V (5340 ppm V_2O_5), 1559 ppm Zn, 228.5 ppm Ni and 259.3 ppm Mo.

    Two adjacent samples collected 26 m apart near the centre of the western traverse segment (RM541 and RM542), over 175 m west of the Road River Group – Canol Formation contact, returned an average of 2945 ppm V (5257 ppm V_2O_5), 153 ppm Ni, 76 ppm Mo and 1160 ppm Zn.

    In addition, six samples from adjacent sites over a distance of 123 m at the western end of the traverse (RM531 to RM536), over 300 m west of the Road River Group – Canol Formation contact, returned an average of 1205 ppm V (2151 ppm V_2O_5). These 6 samples are enriched in Mo (up to 259.3 ppm Mo) but have background values of Ni and Zn.

- ***Traverse 7389600N***
    - 46 samples collected in 2020 (RM285–RM300, RM501–RM530); note significant offset in traverse.

  Three large outcrops of calcareous shale occur near the eastern end of this traverse.

  Chert fragments are a common component of scree in the western part of this traverse (indicative of Canol Formation). Chert is also common at the two most easterly sites and may be indicative of Road River Group unit CDR2 bedrock, which is characterized by shaly limestone, black chert and shale. The eastern part of the traverse is characterized by calcareous scree. A contrast in barium values in soil and scree samples occurs near the central, NNW-trending claim line and this, combined with the scree characteristics, suggests the Road River Group – Canol Formation contact lies near the claim line.

  Sample from two adjacent sites (RM299 and RM300; 24 m apart) overlying the lower Canol Formation returned highly anomalous V-Ni-Mo-Zn values:

  - V: 3327 and 3681 ppm - average of 3504 ppm V (6255 ppm V_2O_5).
  - Ni: 531.1 and 304.7 ppm – average of 418 ppm Ni.
  - Mo: 82.8 and 108.5 ppm – average of 96 ppm Mo.
  - Zn: 4295 and 3123 ppm – average of 3709 ppm Zn.

- ***Traverse 7389050N***
    - 25 samples collected in 2011 (RM1201 to RM1225).

  A small Canol Formation outcrop of siliceous shale / cherty shale occurs near the western end of this traverse and two large outcrops of Road River Group calcareous shale occur near the east end. Chert fragments are fairly common in scree along the western part of the traverse whereas calcareous scree was noted at several sites along the eastern part of the traverse. A transition from high barium values (to the east) to low barium values (to the west) occurs in the central part of the traverse (an indicator of the chemistratigraphic boundary between the Road River Group and the Canol Formation).

  Two samples (RM 1209 and RM1210) from consecutive sites 25 m apart returned an average of 2978 ppm V (5316 ppm V_2O_5), 283 ppm Ni, 68 ppm Mo and 3477 ppm Zn. These sites lie just west of the eastward transition to high Ba contents and likely overlie lower Canol Formation bedrock.

- ***Traverse 7388650N***
    - 2 samples collected in 2010 (RM283–284).
    - 25 samples collected in 2011 (RM1226 to RM1240; RM1276 to 1285); note two significant sampling gaps in this traverse.

    In 2021, fifteen consecutive samples were collected from the western part of this traverse (samples RM1226 to RM1240) followed by 10 samples from the eastern part of this traverse (RM1276 to RM1285). This sampling was generally in line with two samples collected 2010 (RM283 and RM284) and so these 27 samples have been combined as a single traverse. The gap of about 230 m between the two 2021 sets of samples corresponds to a relatively low area (broad saddle) with a thick cover of organic material (Ah soil profile) underlain by shallow permafrost. The Road River Group – Canol Formation contact lies beneath this broad saddle (see below).

    A Canol Formation outcrop of chert and siliceous (cherty) shale was observed while collecting samples from the western segment. Large outcrops of Road River Group calcareous shale occur near the eastern end of the traverse. Chert fragments are common in scree near the Canol Formation outcrop (western segment). Calcareous scree is common at sites along the central traverse segment. The central segment is geochemically characterized by high barium values.

    Samples from the central and eastern segments, underlain by Road River Group strata, returned generally background values for V, Ni, Mo and Zn. The western set of samples, underlain by Canol Formation strata, returned some moderately enriched values of up to 1191 ppm V (2126 ppm V_2O_5), 89.7 ppm Ni, 78.4 ppm Mo and 244 ppm Zn. It is interpreted that the Road River Group – Canol Formation contact, and associated high metal values, lies beneath the broad saddle where samples were not collected due to a thick cover of organic material with frozen ground (permafrost) below.

- ***Traverse 7388300N***
    - 27 samples collected in 2020 (RM201−RM212, RM278−282, RM213−RM222).

    Outcrop of Road River Group calcareous shale outcrop lies near the eastern end of this traverse. Fragments of chert are common at scree sites near the western end of this traverse while calcareous scree is common near the eastern end. The westward transition from high Ba to low Ba values occurs in the west-central part of the traverse.

    Samples containing highly anomalous V−Ni−Mo−Zn values were collected from the west-central part of this traverse just west of the barium transition (i.e. the chemostratigraphic transition from the Road River Group to the Canol Formation). Four consecutive samples (RM207 to RM210) collected over a distance of 77 m returned the following range of values:

    - V: 2641 to 3652 ppm – average of 3145 ppm V (5613 ppm V_2O_5).
    - Ni: 187.8 to 310.5 ppm – average of 255 ppm Ni.
    - Mo: 67.9 to 99.1 ppm – average of 85 ppm Mo.
    - Zn: 2204 to 3899 ppm Zn – average of 3047 ppm Zn.

    The samples collected from sites immediately to the east and west of these four samples also contain elevated metals. If these samples are included the interval spans 126 m (from RM206 to RM211) and the average of the six samples is:

    - 2588 ppm V (4621 ppm V2O3).
    - 239 ppm Ni.
    - 72 ppm Mo.
    - 2544 ppm Zn.

    The most easterly sample from this group of six may be from the uppermost Road River Group.

- ***Traverse 7387650N***
    - 24 samples collected in 2021 (RM1286−RM1309).

    No outcrop was observed along this traverse. Scree fragments of chert, typical of the Canol Formation, were noted at two of the more westerly sites. In addition, scree at the three most easterly sites on this traverse also contained chert (up to 95%) along with limestone and shale. This is suggestive of Road River Group unit CDR2 bedrock, which is characterized by shaly limestone, black chert and shale.

    The westward (up section) transition from high to low barium values, associated with the Road River Group to Canol Formation contact, occurs in the west-central part of the traverse.

    Samples from four consecutive sites (RM1291 to RM1294), collected over a distance of 77 m immediately west of the barium transition, returned average values of 2072 ppm V (3698 ppm V_2O_5), 176 ppm Ni, 55 ppm Mo and 1501 ppm Zn.

- ***Traverse 7387050N***
    - 20 samples collected in 2020 (RM223–RM242).

    A large outcrop of Road River Group calcareous shale lies near the eastern end of this traverse. Chert fragments are common in scree along the western part of this traverse and calcareous scree is common along the eastern part. The up-section transition from high to low barium values occurs near the middle of the traverse.

    Two adjacent samples (RM231 and RM232; 28 m apart) near the contact between calcareous shale to the east and chert-bearing, non-calcareous shale to the west (the Road River Group – Canol Formation contact) are strongly enriched in V, Ni, Mo and Zn. These samples appear to straddle the contact (based on Ba data). Average values for these two samples include 1557 ppm V (2780 ppm V_2O_5), 153 ppm Ni, 64 ppm Mo and 917 ppm Zn.

- ***Traverse 7385700N***
    - 35 samples collected in 2020 (RM243–RM277).

    Outcrop of non-calcareous to strongly calcareous shale occurs along the top of the ridge near the eastern end of the traverse. Chert fragments were observed in scree near the western end of the traverse and calcareous scree is common in the central and eastern parts of the traverse. The up-section (westward) transition from high to low barium values (the chemostratigraphic contact between the Road River Group and the Canol Formation) occurs near the centre of the traverse.

    Four consecutive samples (RM255 to RM258), collected over a distance of 75 m immediately west of the interpreted Road River Group – Canol Formation contact, are strongly anomalous in V, Ni, Mo and Zn.

    - V: 1806 to 3939 ppm – average of 2717 ppm V (4849 ppm V_2O_5).
    - Ni: 193.5 to 366.9 ppm – average of 284 ppm Ni.
    - Mo: 41.2 to 97.9 ppm – average of 75 ppm Mo.
    - Zn: 1505 to 6502 ppm – average of 3513 ppm Zn.

    Metal enrichment continues stratigraphically upward in the Canol Formation. If the next three samples to the west (RM252 to RM254) are added to the four samples above the average vanadium content of the seven samples, collected across a distance of 156 m, is 2217 ppm V (3957 ppm V_2O_5), 253 ppm Ni, 68 ppm Mo and 2630 ppm Zn.

    Metal values in soil and scree samples collected over the upper Road River Group range as high as 904 ppm V, 254.2 ppm Ni, 62.8 ppm Mo and 524 ppm Zn.

- ***Traverse 7385300N***
  - 27 samples collected in 2021 (RM1316–RM1342).

  No outcrop was observed along this traverse. The traverse was stopped near the top of a talus slope that extends eastward down to a SW-flowing stream. Near the eastern end of the traverse a minor NNW-trending ridge was encountered and along the top of this ridge a linear, NNW-trending zone roughly 0.5 to 1 m wide of abundant limestone blocks (rubble) up to 25 cm across was encountered. This is believed to represent a limestone bed in the underlying Canol Formation.

  Chert fragments occur in scree along the western part of the traverse. Limestone fragments occur in scree eastward (downslope) from the abundant limestone rubble along the top of the ridge. The accompanying shale fragments, which make up the vast majority of this scree, are non-calcareous. Small amounts of limestone fragments also occur at two sites near the western end of the traverse in association with non-calcareous shale.

  Barium values from all samples collected on this traverse are relatively low indicating that the entire traverse is underlain by Canol Formation stata.

  Soil and scree samples from the eastern part of this traverse, overlying lower Canol Formation bedrock, are strongly enriched in metals. The samples from the six most easterly sites (RM1337 to RM1342), collected over a distance of 135 m, returned an average of 2922 ppm V (5216 ppm V_2O_5), 321 ppm Ni, 77 ppm Mo and 3679 ppm Zn. The most highly enriched sample (RM1337) yielded 5030 ppm V (8980 ppm V_2O_5), 504.4 ppm Ni, 114.9 ppm Mo and 6924 ppm Zn.

  The next three samples collected to the west (RM1334 to RM1336) also display metal enrichment. If these samples are included in calculations the easternmost nine samples (RM1334 to RM1342), collected over a distance of 207 m, have average values of 2585 ppm V (4614 ppm V2O3), 314 ppm Ni, 74 ppm Mo and 3583 ppm Zn.

  Other elements that display considerable enrichment within these soil and shale samples include antimony (up to 103.1 ppm Sb) and silver (up to 13.5 ppm Ag).

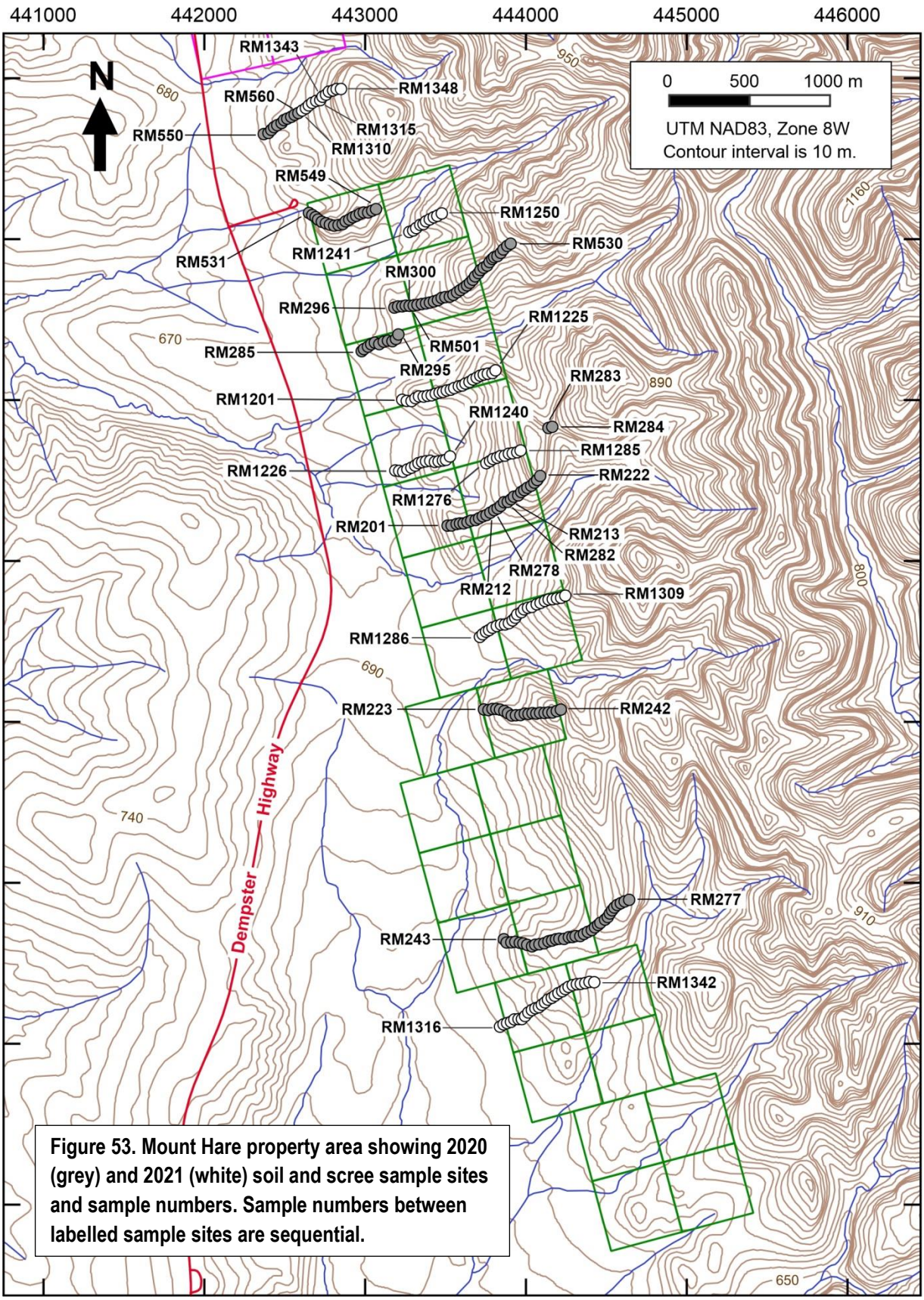


Figure 53. Mount Hare property area showing 2020 (grey) and 2021 (white) soil and scree sample sites and sample numbers. Sample numbers between labelled sample sites are sequential.

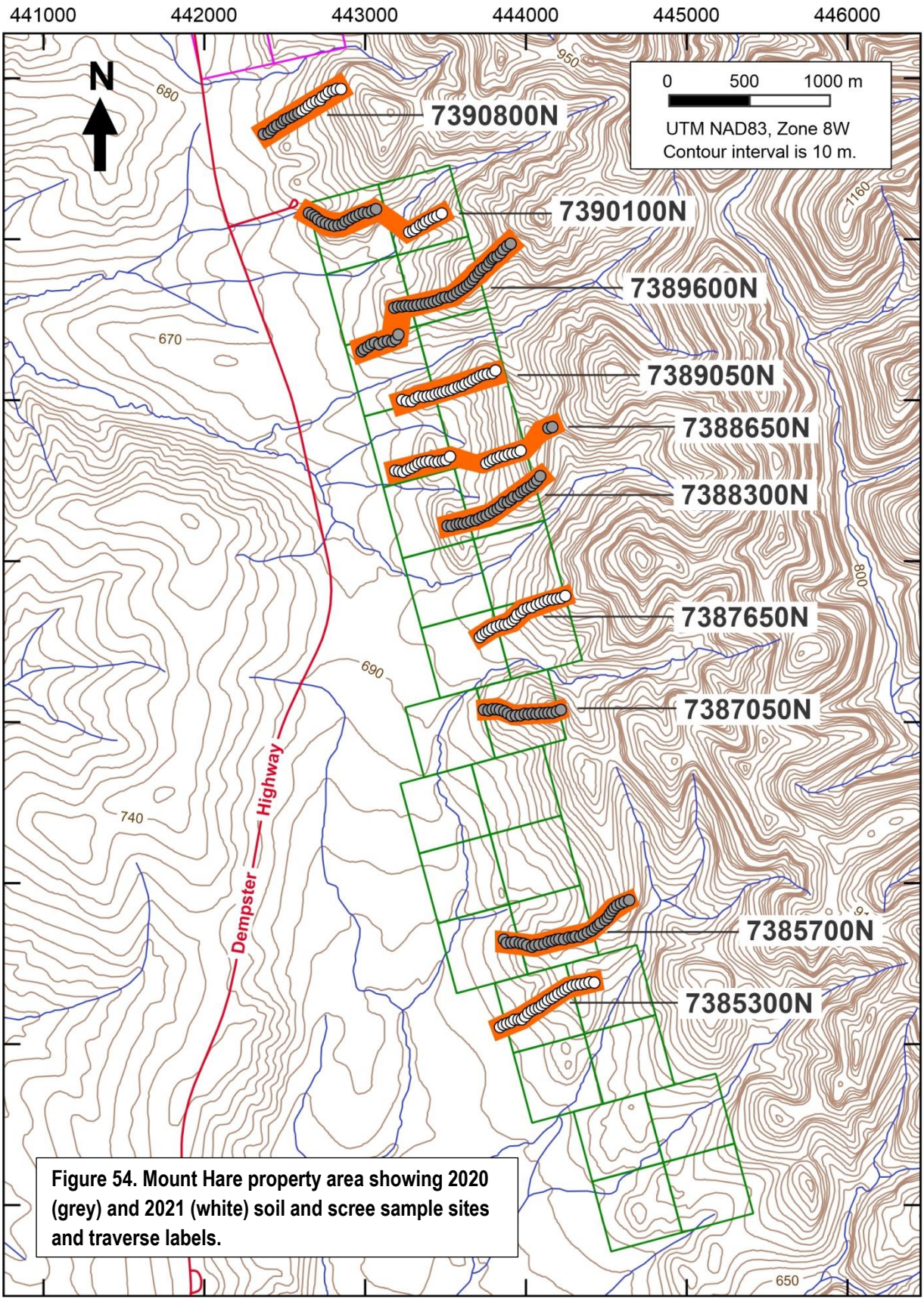


Figure 54. Mount Hare property area showing 2020 (grey) and 2021 (white) soil and scree sample sites and traverse labels.

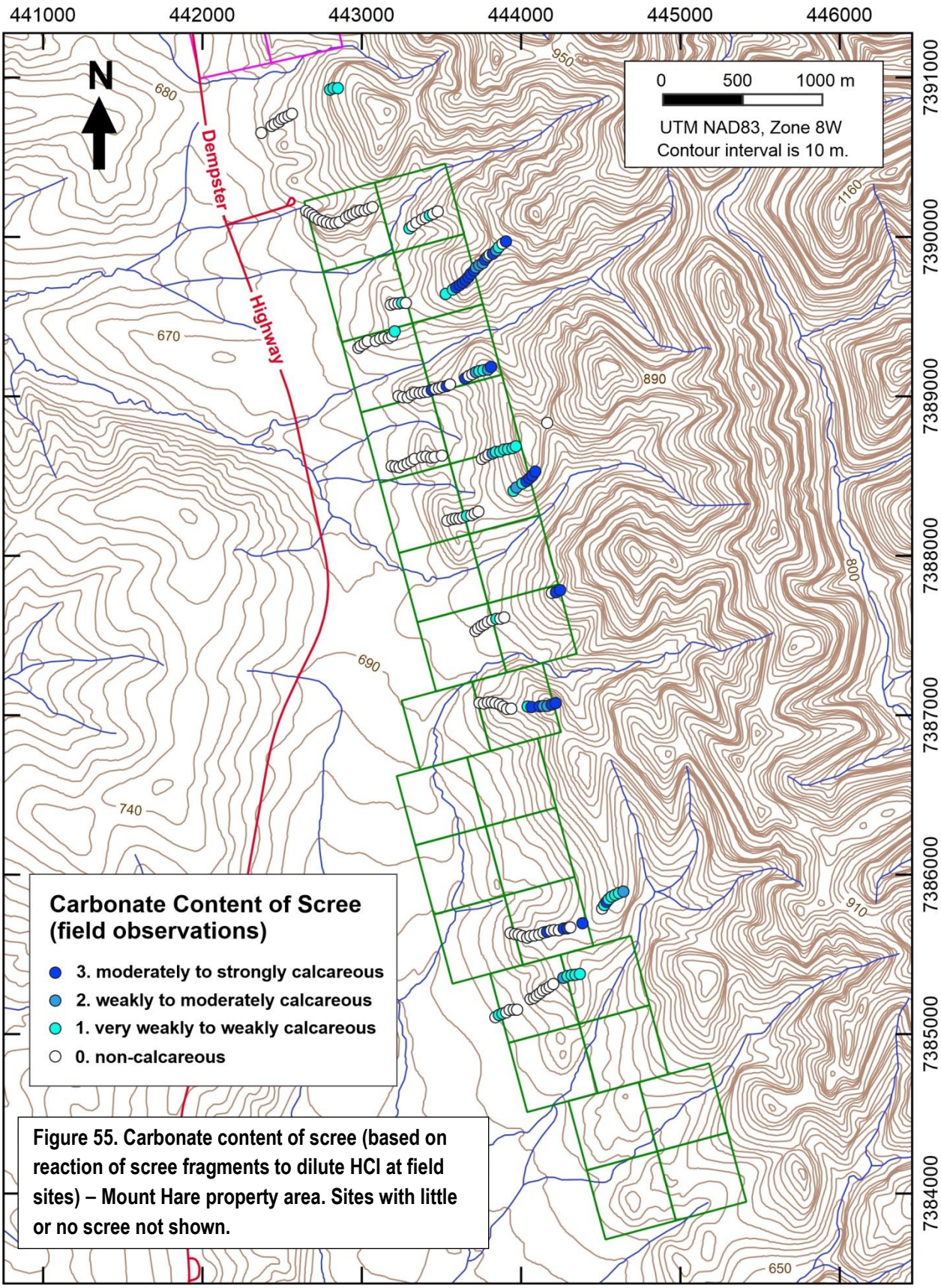


Figure 55. Carbonate content of scree (based on reaction of scree fragments to dilute HCl at field sites) – Mount Hare property area. Sites with little or no scree not shown.

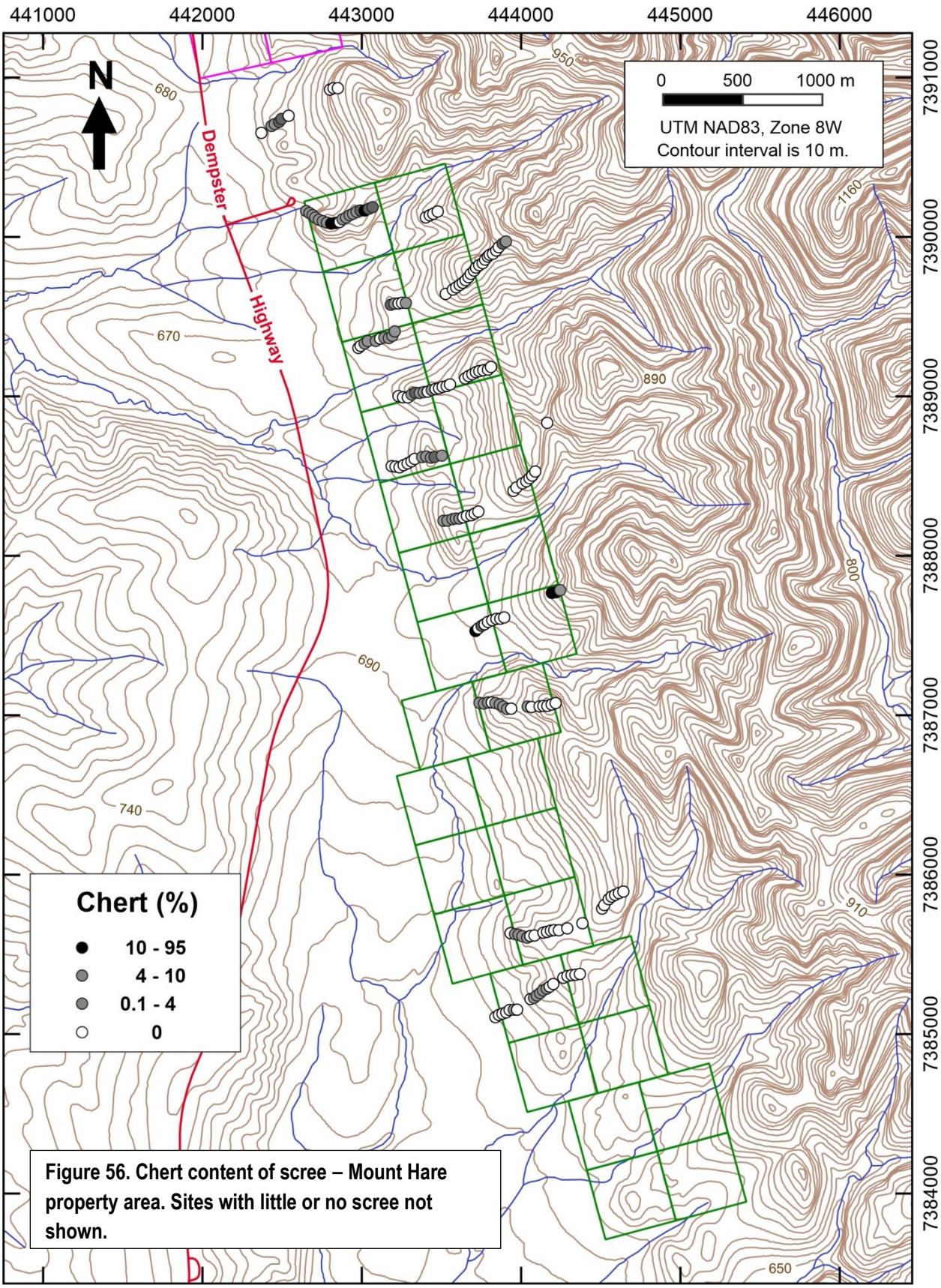


Figure 56. Chert content of scree – Mount Hare property area. Sites with little or no scree not shown.

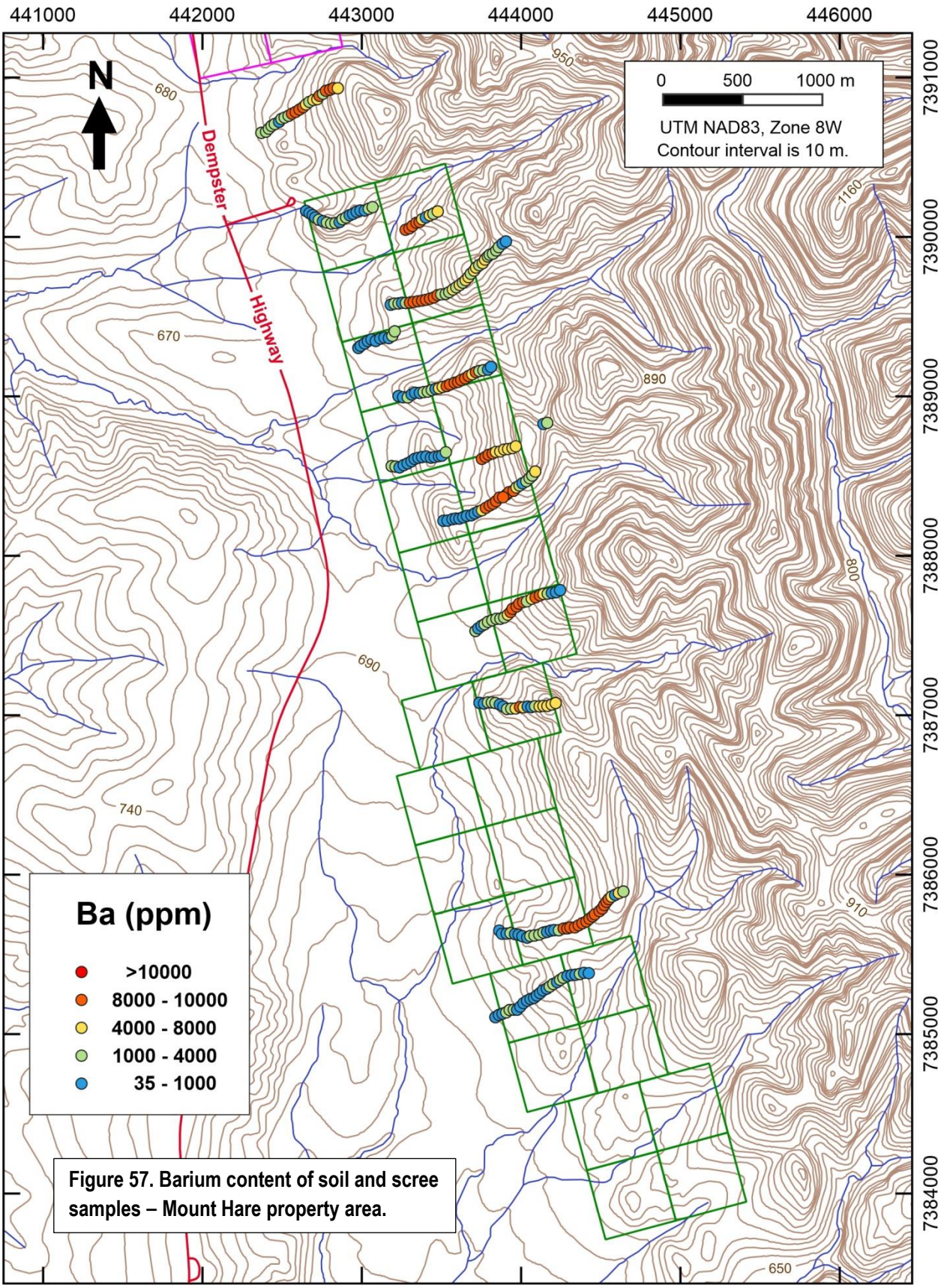


Figure 57. Barium content of soil and scree samples – Mount Hare property area.

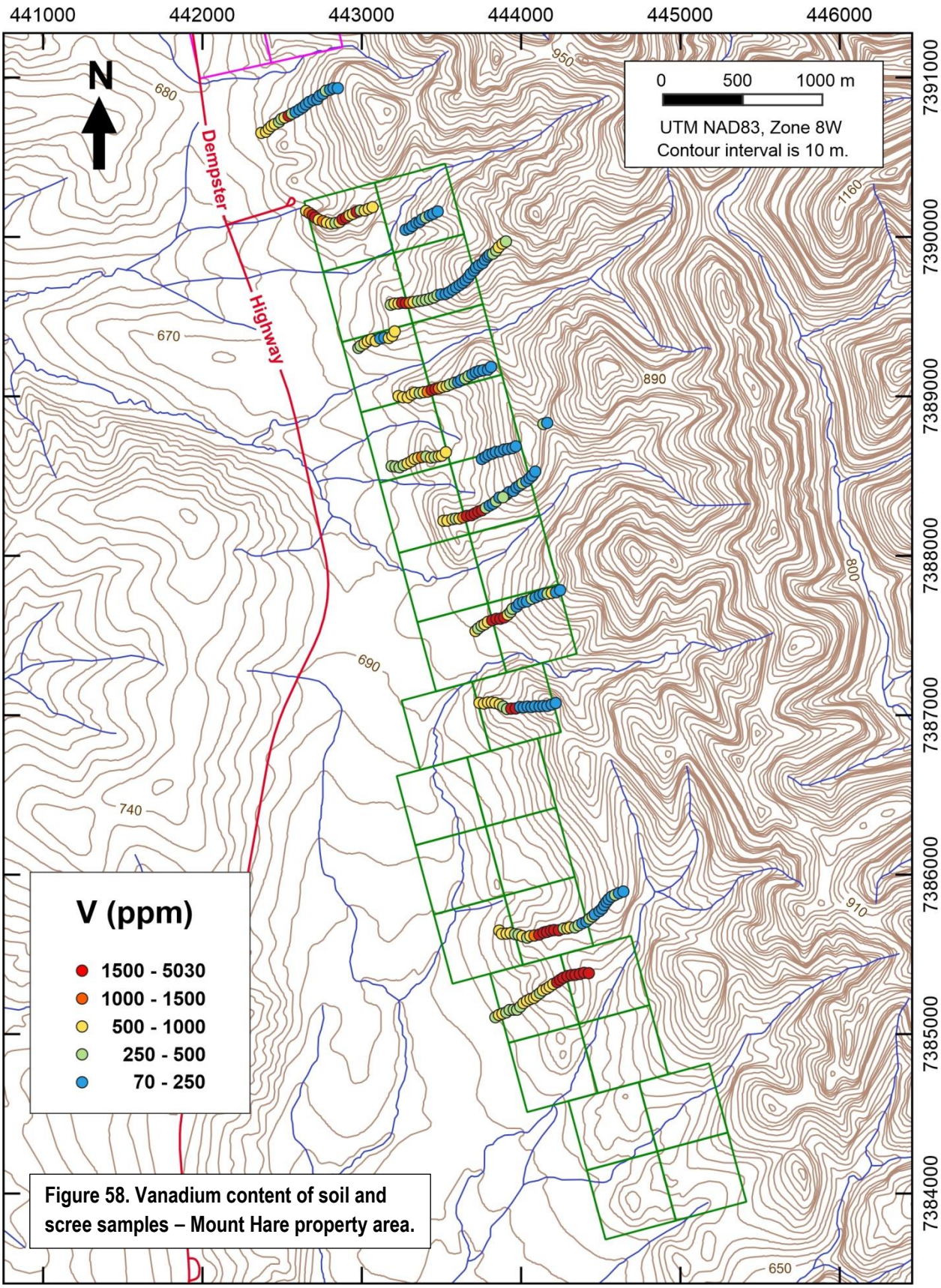


Figure 58. Vanadium content of soil and scree samples – Mount Hare property area.

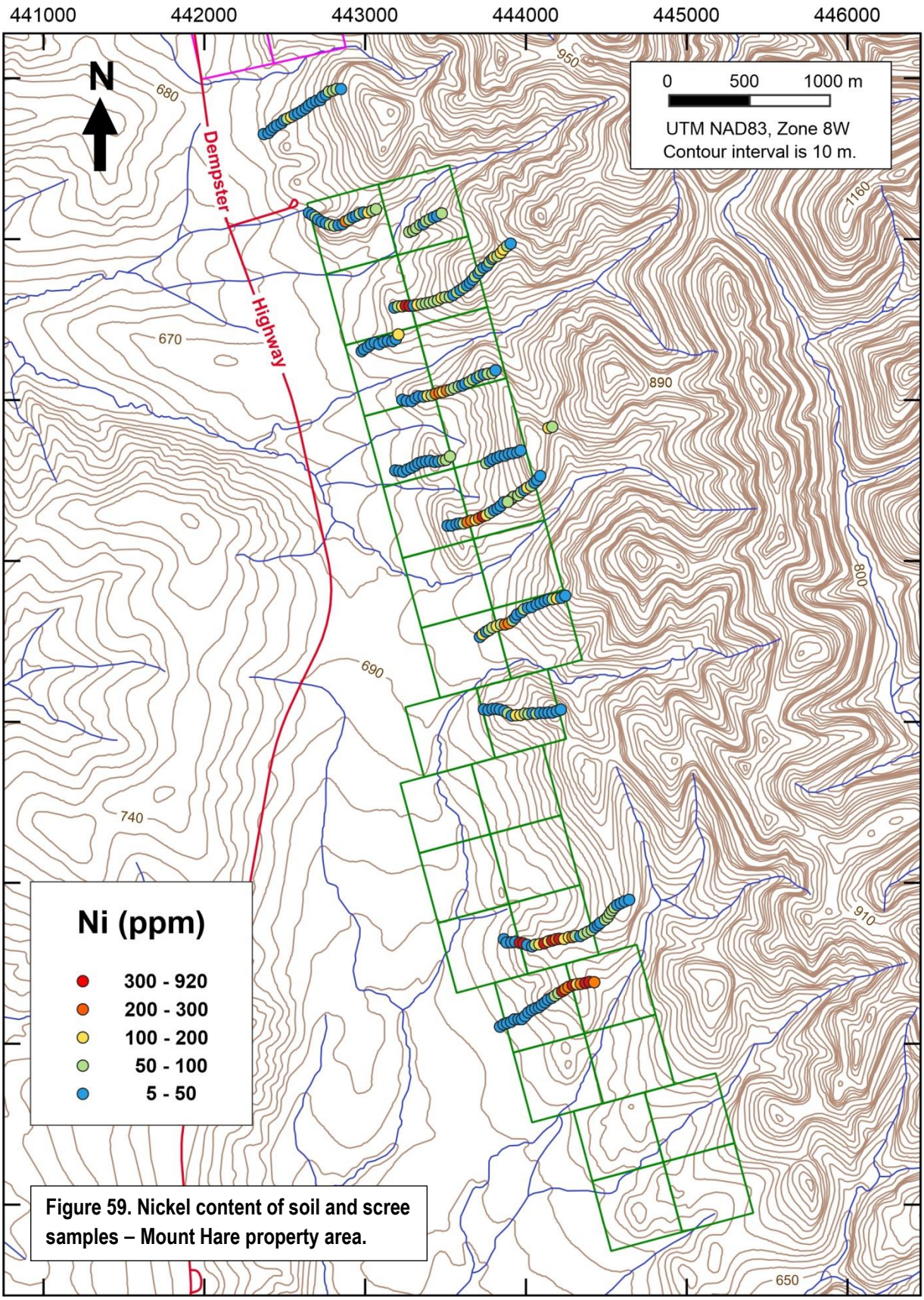


Figure 59. Nickel content of soil and scree samples – Mount Hare property area.

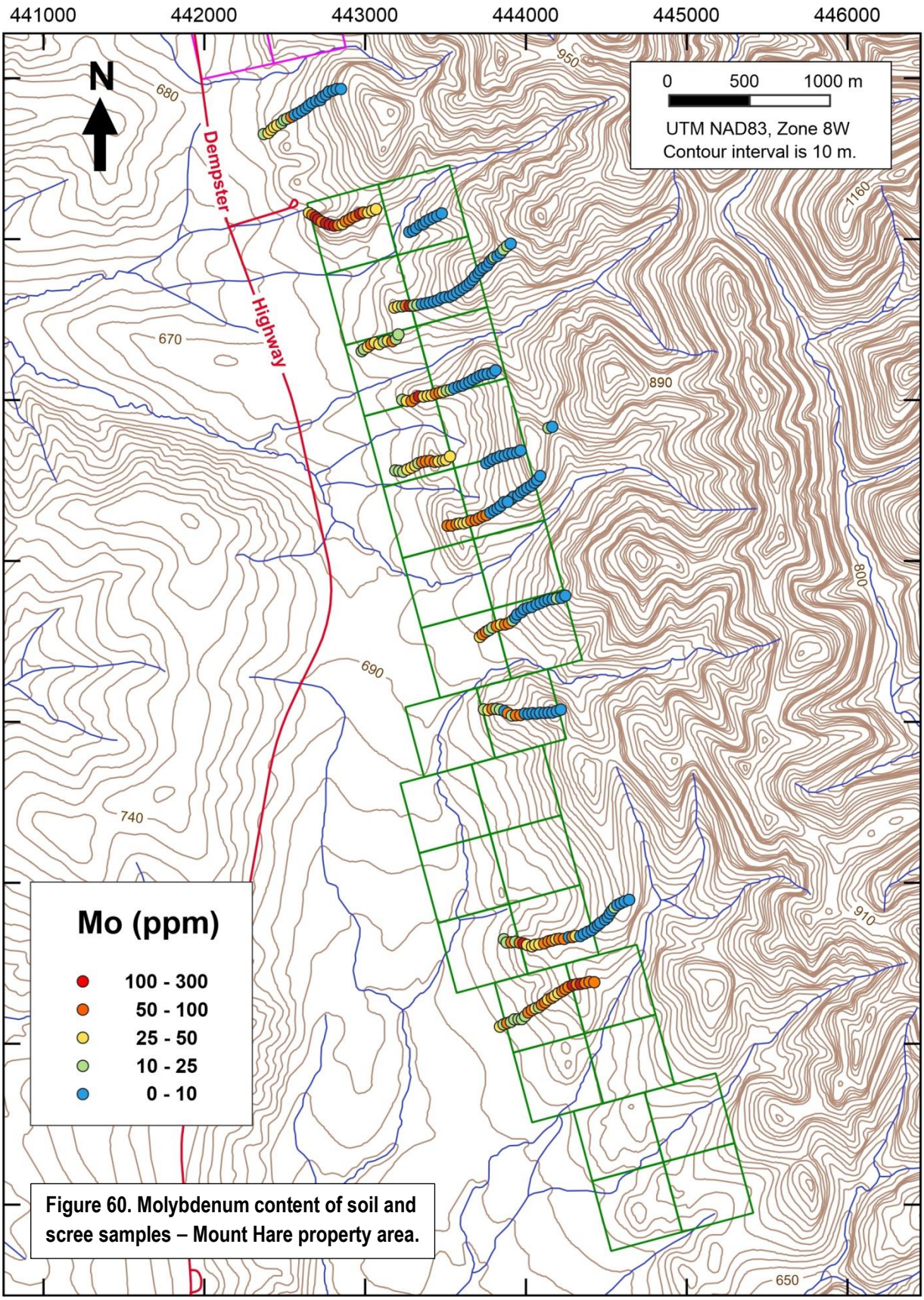


Figure 60. Molybdenum content of soil and scree samples – Mount Hare property area.

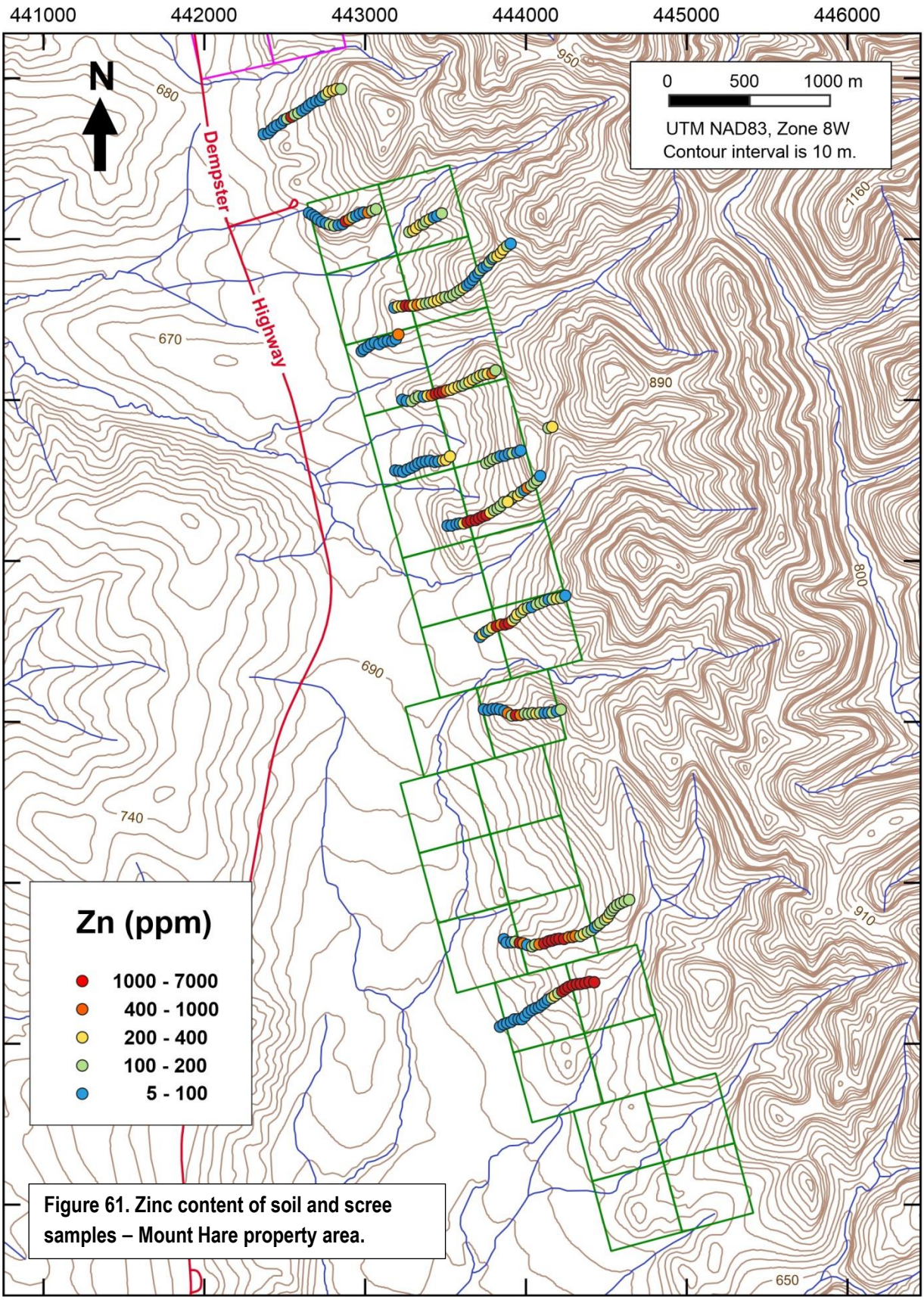


Figure 61. Zinc content of soil and scree samples – Mount Hare property area.

Soil and Scree Geochemical Profiles

A series of geochemical profiles representing analytical data obtained from the 7388300N sampling traverse are presented in Figure 62 and 63 (note the logarithmic value scales). The Road River Group – Canol Formation contact has been placed based on the sharp westward (stratigraphically upward) transition from high to low Ba values (a chemostratigraphic boundary marked by a >10 fold change in Ba contents). Samples collected more than 25 m east of the contact in areas underlain by upper Road River Group strata have relatively low values of all elements shown except for Ba. The 200 m interval immediately east of the contact is characterized by Ba values generally in excess of 10000 ppm. Strong enrichment of V near the contact and west of the contact (by a factor of >10 relative to typical Road River Group values) is accompanied by corresponding increases in Ni, Mo, Zn, As, Sb, Se and, to lesser extents, U and Ag. The drop offs in values towards the west end of the sampling traverse are modest for V, Mo, U, As, Sb, Se, whereas Zn, Ni and Ag drop to background concentrations.

The WRM project area occurs in unglaciated terrain so geochemical anomalies in surficial sediment (soil and scree) should not have undergone significant transport. However, the amount of downslope physical movement of soil and scree (creep) and the possible effects of geochemical migration are unknown.

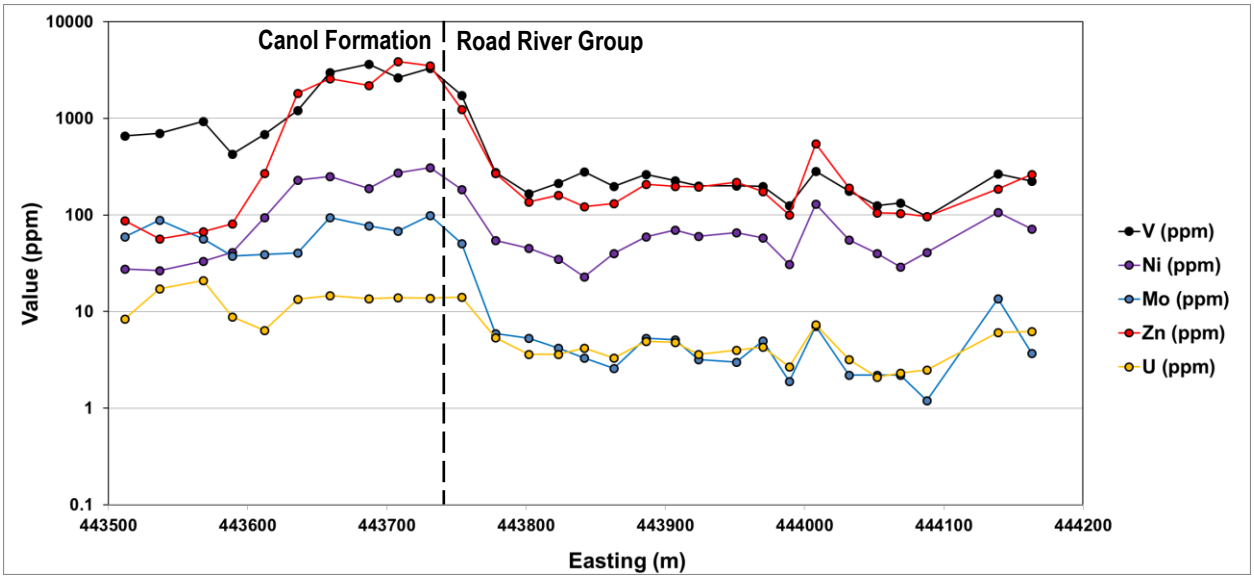


Figure 62. Geochemical profiles for soil and scree sampling traverse 7388300N – V, Ni, Mo and U. The Road River Group – Canol Formation contact is positioned based on Ba geochemistry. Ba values of >10000 ppm (the upper analytical detection limit) are plotted as 10000 ppm.

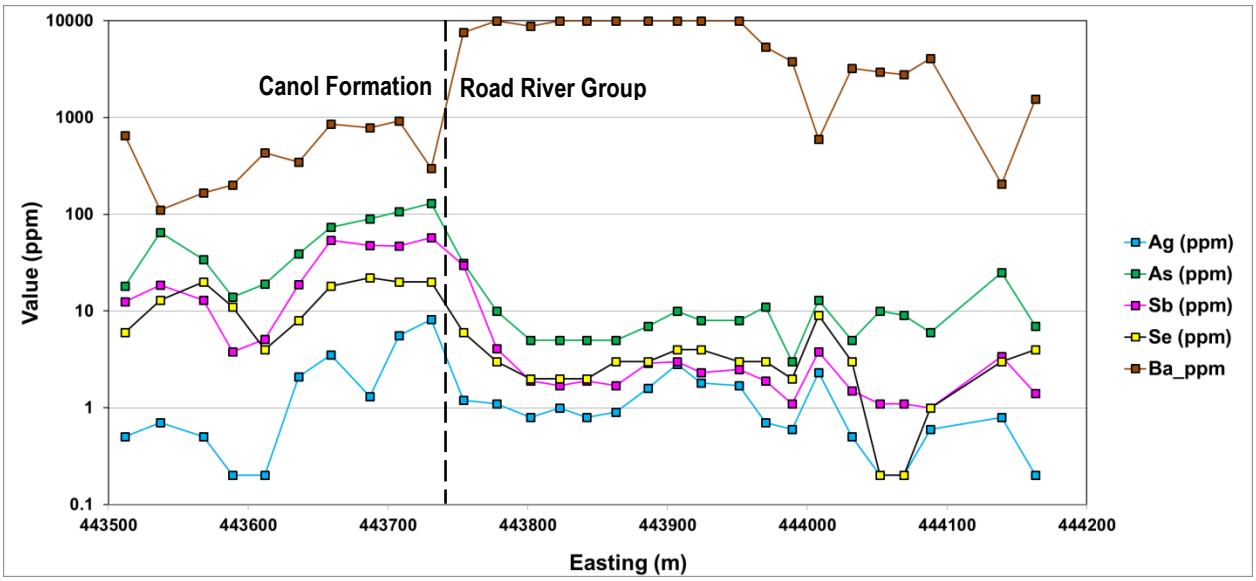


Figure 63. Geochemical profiles for soil and scree sampling traverse 7388300N – Ag, As, Sb, Se and Ba. The Road River Group – Canol Formation contact is positioned based on Ba geochemistry. Ba values of >10000 ppm (the upper analytical detection limit) are plotted as 10000 ppm.

Discussion and Recommendations

Sheep Creek Property Area

Geology

The transition from calcareous shale of the upper Road River Group to siliceous shale of the Canol Formation occurs in outcrop north of the Rock River (Sheep Creek) about 700 m east of the Dempster Highway (observed during 2021 field work and confirmed by rock geochemical data; Figure 46). This indicates that the placement of the nearby east-west trending fault by the Yukon Geological Survey (2018) is too far north and that it actually occurs in the east branch valley as shown by Cecile et al. (1982). This difference in placement is only about 50 to 100 m and may be a compilation error in the Yukon Geological Survey (2018) map.

Stratigraphic contacts in the area of the south branch of the Rock River (Sheep Creek) have been moved up to 400 m west from the locations of Cecile et al. (1982) and Yukon Geological Survey (2018). The strata are offset by a fault located during the 2020 field work in the west bank of the south branch (Figure 46).

The location of the transition from calcareous shale of the Road River Group to siliceous shale of the Canol Formation on the outcrop section north of Rock River (Sheep Creek) was collaborated by significant changes in the concentrations of certain elements determined by rock chip sampling. Silicon and barium are perhaps the most useful chemostratigraphic elements (Si increases upward across the contact and Ba decrease). Calcium is also a useful chemostratigraphic element provided one avoids sampling the narrow limestone beds that occur locally within the lower Canol Formation.

Rock Geochemistry

The premier rock sampling result was the identification of metal-rich shale strata spanning the Road River Group – Canol Formation contact. Note that the average grades presented below are based on 0.5 m chip samples collected about 25 m apart along the outcrop section, which is roughly perpendicular to strike.

- Samples RM1401 to RM1416 (16 samples), collected over 372 m, average of 0.17% V (0.31% V_2O_5), 160 ppm Ni, 56 ppm Mo and 1218 ppm Zn.
- Includes:
    - Samples RM1406 to RM1415 (10 samples), collected over 225 m, average 0.21% V (0.37% V_2O_5), 154 ppm Ni, 50 ppm Mo and 1485 ppm Zn.
- And:
    - Samples RM1411 to RM1413 (3 samples), collected over 55 m, average 0.27% V (0.48% V_2O_5), 169 ppm Ni, 69 ppm Mo and 1722 ppm Zn (these three samples were collected from the lower Canol Formation).

Soil and Scree Geochemistry

Thirty-eight soil and scree samples were collected in 2021 along two Sheep Creek property traverses roughly perpendicular to strike. Geochemical results of interest, from samples collected at sites about 25 m apart, are presented below.

Southern Traverse

- The samples from the seven most easterly sites (RM1269 to RM1275), collected over a distance of 150 m, returned an average of 2242 ppm V (0.40% V_2O_5), 275 ppm Ni, 69 ppm Mo and 952 ppm Zn.
- Within this interval the five most easterly samples, collected over a distance of 104 m, returned an average of 2597 ppm V (0.46% V_2O_5), 330 ppm Ni, 82 ppm Mo and 1062 ppm Zn.

Northern Traverse

- The samples collected from the four most westerly sites (RM1349 to RM1352), collected over a distance of 80 m, returned an average of 1681 ppm V (0.30% V_2O_5), 111 ppm Ni, 34 ppm Mo, and 984 ppm Zn. This traverse may lie too far east to have sampled the complete mineralized interval.

Recommendations

- Additional staking to the north and south of the Sheep Creek property.
- Stream sediment sampling of streams to the east of the Road River Group – Canol Formation contact to evaluate mineral potential within lower stratigraphic intervals of the Road River Group.
- The potential economic viability of a shale-hosted vanadium deposit (± accessory elements) within the Sheep Creek property, based on the indications of grades and widths obtained during the WRM project rock, soil and scree sampling, should be evaluated from mining, metallurgical, environmental and societal perspectives. If the evaluation is encouraging an initial program of trenching and/or drilling is recommended to explore the recently identified metal zones.

Mount Hare Property Area

Geology

Stratigraphic contacts in the Mount Hare property area have been moved up to 350 m west from the locations of Cecile et al. (1982) based on 2020 and 2021 mapping and chemostratigraphy (Figure 46).

Stream Silt Geochemistry

In 2021 a series of steam silt samples were collected from a stream that flows in a westerly direction across the central part of the Mount Hare property. Most of the samples were collected east to the Mount Hare property and the sampling extended to about 1 km east of the Road River Group – Canol Formation contact. As expected, samples collected near the contact were highly anomalous in V, Ni, Mo and Zn. However, upstream sites also returned elevated metal values with the highest values from the easternmost sample site (sample RM1601; 346 ppm V, 47.2 ppm Ni, 7.7 ppm Mo and 529 ppm Zn). These data suggest another source of metals within the Road River Group stratigraphically well below (east of) the Canol Formation. Cobbles and boulders in the rocky stream bed at sample site RM1601 consist of abundant black, black weathering chert and dark grey, medium grey weathering limestone along with a minor amount of limestone breccia. These rock types are reminiscent of Road River Group unit CDR2.

Soil and Scree Geochemistry

A total of 283 soil and scree samples were collected from the Mount Hare property area during 2020 and 2021. These samples were collected on ridgeline traverses along generally east-west trending minor ridges (spurs), roughly perpendicular to strike, with a nominal sample spacing of 25 m. The samples were collected from ten traverses with the most northerly and most southerly traverses being about 5.7 km apart. The traverses are identified by their northing coordinates. On two of the traverses (7390100N and 7388650N) it was not possible to obtain soil and scree samples across the Road River Group – Canol Formation contact. Results for vanadium, nickel, molybdenum and zinc are presented in Table 11. There appears to be a general increase in mineralized widths moving from northern traverses to southern traverses.

- Note: average grade and width data are presented in Table 11. As the sampling is not continuous (the soil and scree samples are point samples collected approximately 25 m apart) the calculated average grades are only roughly indicative of the average values that would be obtained by continuous sampling. It is unknown how closely the results obtained from soil and scree sampling will correlate with metal contents in the underlying bedrock. Factors favouring a positive correlation include the lack of past glaciation in this area and the relatively thin overburden (soil and scree) cover along the traversed ridges. However, downslope dispersion will tend to decouple the overburden and bedrock values.

Recommendations

- Additional staking to the south of the Mount Hare property.
- Additional soil and scree sampling traverses both within and south of the area of existing coverage.
- Additional stream sediment sampling east of the Road River Group – Canol Formation contact to evaluate potential for mineralization within lower stratigraphic intervals of the Road River Group.
- Additional geological mapping and rock sampling (particularly if outcrop near the Road River Group – Canol Formation contact is located).
- Air photo interpretation (to identify the Road River Group – Canol Formation contact and areas where strata are offset by faults).
- The potential economic viability of a shale-hosted vanadium deposit (± accessory elements) within the Mount Hare property, based on the indications of grades and widths obtained during the 2020 and 2021 soil and scree sampling, should be evaluated from mining, metallurgical, environmental and societal perspectives. If the evaluation is encouraging an initial program of trenching and/or drilling is recommended to evaluate bedrock metal values beneath the soil and scree anomalies identified by the WRM project.

Traverse	Sample Numbers	Sampling Distance (m)	Average V (ppm)	Average V_2O_5 (%)	Average Ni (ppm)	Average Mo (ppm)	Average Zn (ppm)	Comment
7390800N	RM558	na	3205	0.57	185	83	1192	Lower Canol Formation.
7390100N	RM541 to RM542	26	2945	0.53	153	76	1160	Canol Formation (over 175 m west of the Road River Group – Canol Formation contact). ***No samples across the Road River Group – Canol Formation contact on this traverse.***
7389600N	RM299 to TM300	24	3504	0.63	418	96	3709	Lower Canol Formation.
7389050N	RM1209 to RM1210	25	2978	0.53	283	68	3477	Lower Canol Formation.
7388300N	RM206 to RM211	126	2588	0.46	239	72	2544	Lower Canol Formation and upper Road River Group.
7388300N (includes)	RM207 to RM210	77	3145	0.56	255	85	3047	Lower Canol Formation.
7387650N	RM1291 to RM1294	77	2072	0.37	176	55	1501	Lower Canol Formation.
7387050N	RM231 to RM232	28	1557	0.28	153	64	917	Lower Canol Formation and upper Road River Group.
7385700N	RM252 to RM258	156	2217	0.40	253	68	2630	Lower Canol Formation.
7385700N (includes)	RM255 to RM258	75	2717	0.48	284	75	3513	Lower Canol Formation.
7385300N	RM1334 to RM1342	207	2585	0.46	314	74	3583	Lower Canol Formation.
7385300N (includes)	RM1337 to RM1342	135	2922	0.52	321	77	3679	Lower Canol Formation.

Table 11. Average vanadium, nickel, molybdenum and zinc values for selected soil and scree sample traverse intervals in the Mount Hare property area.

References

Alberta Geological Survey. 2015. Alberta table of formations. Alberta Energy Regulator.

Bentzen, E.H. (2016): Bisoni McKay Vanadium Property, Nye County, Nevada. NI 43-101 report for Stina Resources Ltd., 120 p.

Burleigh, R.E. (1992): Field report on vanadium mineral investigation of the Road River Formation in the Eagle, Alaska area. U.S. Bureau of Mines, 7 p.

Cecile, M.P., Hutcheon, I.E. and Gardner, D. (1982): Geology of the northern Richardson anticlinorium. Geological Survey of Canada, Open File 875 (map), 1:125 000.

Duk-Rodkin, A., 1999: Glacial limits map or Yukon Territory. Geological Survey of Canada, Open File 3694, scale 1:1000000.

Dumala, M.R., 2007a: Assessment report describing prospecting, mapping, geochemical sampling and diamond drilling at the Fox property. Yukon assessment report prepared by Archer, Cathro and Associates (1981) Limited for Southampton Ventures Inc. and Strategic Metals Ltd., 204 p.

Dumala, M.R., 2007b: Assessment report describing prospecting, mapping, geochemical sampling and diamond drilling at the Sun property. Yukon assessment report prepared by Archer, Cathro and Associates (1981) Limited for Southampton Ventures Inc. and Strategic Metals Ltd., 114 p.

Dumala, M.R., 2007c: Assessment report describing prospecting, mapping, geochemical sampling and diamond drilling at the Rich property. Yukon assessment report prepared by Archer, Cathro and Associates (1981) Limited for Southampton Ventures Inc. and Strategic Metals Ltd., 452 p.

Ferri, F., McMechan, M., and Creaser, R. (2015): The Besa River Formation in Liard Basin, British Columbia. In Oil and gas geoscience reports 2015. British Columbia Ministry of Natural Gas Development, Victoria, B.C., pp. 1–27.

Ferri, F., McMechan, M., Fraser, T., Fiess, K., Pyle, L., and Cordey, F. (2013): Summary of field activities in the western Liard Basin, British Columbia. In Geoscience reports 2013. British Columbia Ministry of Natural Gas Development, Victoria, B.C., pp. 13–31.

Fraser, T.A., Allen, T.L., Lane, L.S. and Reyes, J.C. (2012): Shale gas potential of Devonian shale in north Yukon: Results from a diamond drillhole study in western Richardson Mountains. *In:* Yukon Exploration and Geology 2011, K.E. MacFarlane and P.J. Sack (eds.), Yukon Geological Survey, p. 45-74.

Fraser, T.A. and Hutchison, M.P. (2017): Lithogeochemical characterization of the Middle–Upper Devonian Road River Group and Canol and Imperial formations on Trail River, east Richardson Mountains, Yukon: age constraints and a depositional model for fine-grained strata in the Lower Paleozoic Richardson trough. Canadian Journal of Earth Sciences, v. 54, p. 731–765.

Gadd, M.G., Peter, J.M., Fraser, T.A., and Layton-Matthews, D. (2019), Lithogeochemical and Sulphur isotope indicators of environment of formation and genesis of the Moss hyper-enriched black shale showing, Yukon. In Rogers, N., ed., Targeted Geoscience Initiative: 2018 Report of Activities: Geological Survey of Canada Open File 8549, p. 163–178.

Gadd, M.G., Peter, J.M., Fraser, T.A. and Layton-Matthews, D. (2019): Lithogeochemical and sulphur isotope indicators of environment of formation and genesis of the Moss hyper-enriched black shale showing, Yukon. *In* Targeted Geoscience Initiative: 2018 report of activities, (ed.) N. Rogers; Geological Survey of Canada, Open File 8549, p. 163–178.

Gregory, D., 2008: Assessment report describing prospecting, mapping and diamond drilling at the Rich property. Yukon assessment report prepared by Archer, Cathro and Associates (1981) Limited for Southampton Ventures Inc. and Strategic Metals Ltd., 43 p.

Hannigan, P.K. (2014): Oil and gas resource potential of Eagle Plain basin. Yukon, Canada. Geological Survey of Canada, Open File 7565, 173 p.

Hanson, K., Orbock, E.J.C. and Peralta, E. (2018): Gibellini vanadium project, Eureka County, Nevada, NI 43-101 technical report on preliminary economic assessment. NI 43-101 report prepared for Prophecy Development Corp., 255 p.

Héon, D. (2006): Mineral assessment of the Eagle Plain study area, Yukon. Yukon Geological Survey, Open File 2006-3. Includes 2 reports: original study (103 p. plus 1 map) and update (12 p. plus 4 maps).

Hills, L.V., Sangster, E.V. and Suneby, L.B. (1981): Lexicon of Canadian stratigraphy, Volume 2, Yukon Territory and District of Mackenzie. Canadian Society of Petroleum Geologists, Calgary, Canada, 240 p.

Hornbrook, E.H.W; Lynch, J.J, (1977): Uranium Reconnaissance Program National Stream Sediment and Water Geochemical Reconnaissance Data, Northern Yukon Territory, Parts of NTS 106E, L and 116H, I; Geological Survey of Canada Open File 420 (1 .zip file. https://doi.org/10.4095/129224).

Hutchison, M.P. and Fraser, T.A. (2015): Palaeoenvironment, palaeohydrography and chemostratigraphic zonation of the Canol Formation, Richardson Mountains, north Yukon. *In* Yukon exploration and geology 2014. Edited by K.E. MacFarlane, M.G. Nordling and P.J. Sack. Yukon Geological Survey, pp. 73–98.

Lewis, S.E. and Dickens, G.R. (2010): The geochemistry of primary and weathered oil shale and coquina across the Julia Creek vanadium deposit (Queensland, Australia). Mineralium Deposita, v. 45, p. 599-620.

Morrow, D.W. (1999): Lower Paleozoic stratigraphy of northern Yukon Territory and northwestern District of Mackenzie. Geological Survey of Canada, Bulletin 538, 202 p.

Norford, B.S. (1964): Reconnaissance of the Ordovician and Silurian rocks of northern Yukon Territory (report and 4 figures); Geological Survey of Canada, Paper 63-39, 139 p Norris, D.K. (1981): Geology: Eagle River, Yukon Territory. Geological Survey of Canada, Map 1523A, 1:350,000.

Norris, D.K. (1981): Geology: Eagle River, Yukon Territory. Geological Survey of Canada, Map 1523A, 1:250 000.

Norris, D.K. (1985): Stratigraphy of Devonian outcrop belts in northern Yukon Territory and northwestern District of Mackenzie (Operation Porcupine area). Geological Survey of Canada, Memoir 410, 81 p.

Norris, D.K. (1997): The geology, mineral and hydrocarbon potential of northern Yukon Territory and Northwestern District of Mackenzie. Geological Survey of Canada Bulletin 422, 401 p.

Okulitch, A.V. and Irwin, D. (2014): Geological compilation of the Western Mainland and Southern Arctic Islands regions, Northwest Territories. NWT Open File 2014-01.

Osadetz, K.G., Chen, Z. and Bird, T.D. (2005): Petroleum Resource Assessment, Eagle Plain Basin and Environs, Yukon Territory, Canada. Yukon Geological Survey Open File 2005-2, Geological Survey of Canada Open File 4922, 88 p.

Pigage, L. (2007): Yukon stratigraphic correlation chart, v. 3.0. Yukon Geological Survey and Oil and Gas Management Branch, YGS Open File 2007-2.

Prior, G.J. (2021): WRM (Western Richardson Mountains) mineral exploration project, Dawson Mining District, Yukon. Yukon Mineral Exploration Program (YMEP) Report 20-064, 191 p.

Puritch, E., Hayden, A., Partsch, A., Harron, G.A. and Brown, F.H. (2010): Preliminary economic assessment on the Viken MMS project, Sweden. NI 43-101 report prepared for Continental Precious Minerals Inc., 129 p.

Pyle, L.J., Gal, L.P. and Fiess, K.M. (2014): Devonian Horn River Group: a reference section, lithogeochemical characterization, correlation of measured sections and wells, and petroleum-potential data, Mackenzie Plain area (NTS 95M, 95N, 96C, 96D, 96E, 106H, and 106I), NWT. Northwest Territories Geoscience Office, Open File 2014-06.

Stryhas, B., Clarkson, B.M. and Wright, F. (2019): NI 43-101 Technical Report, Carlin Vanadium Project, Carlin, Nevada. NI 43-101 report prepared for First vanadium Corp., 137 p.

Van Kooten, G.K., Watts, A.B., Coogan, J., Mount, V.S., Swenson, R.F., Daggett, P.H., et al. (1997): Geologic investigations of the Kandik area, Alaska and adjacent Yukon Territory, Canada. Alaska Division of Geological and Geophysical Surveys, Report of Investigations 96-6a, sheet 1 of 3.

Yukon Geological Survey (2015). Yukon Digital Bedrock Geology (accessed 2015).

Yukon Geological Survey (2018). Yukon Digital Bedrock Geology (accessed 2018).

Statement of Qualifications

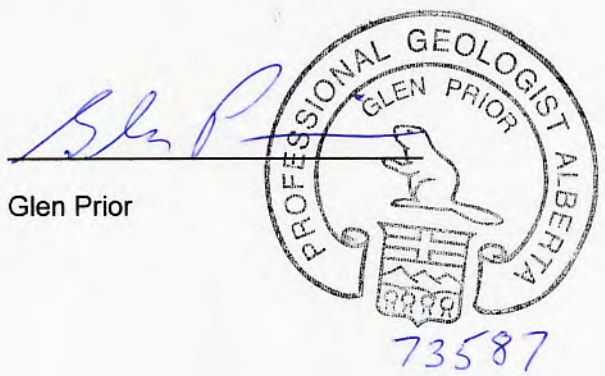
I, Glen Prior, of 793 Birch Avenue, Sherwood Park, Alberta do hereby declare:

- That I am a self-employed geologist.
- That I am a Professional Geologist registered with the Association of Professional Engineers and Geoscientists of Alberta (Member Number 73587).
- That I am a Professional Geoscientist registered with Engineers and Geoscientists British Columbia (Registration Number 53291).
- That I graduated from Laurentian University in Sudbury, Ontario, with a B.Sc. (Honours) degree in geology in 1982, from Laurentian University in Sudbury, Ontario, with a M.Sc. degree in geology in 1987 and from Carleton University in Ottawa, Ontario, with a Ph.D. degree in geology in 1996.
- That I practiced my profession full-time from 1986 to 1991 and continuously since 1996.

March 21, 2022

Sherwood Park, Alberta

Glen Prior



Appendix 1

Rock Sample Descriptions and Geological Observations

Location Coordinates: UTM Zone 8W, NAD83

Rock Site #	Sample	East	North	Elev (m)	Feature	Description	Bedding Attitude	Unit	Notes	Date
2021_12	**RM1401**	442032	7410076	557	rock sample (outcrop)	0.5 m chip perpendicular to bedding. Dark grey, dark grey weathering, moderately hard, calcareous shale. Strong spotty to pervasive reaction to dilute HCl. Moderately to strongly fissile. Graptolites noted on a few talus pieces at the base of the outcrop (cliff).	342°/30°W	Road River Group	116I/16. E branch of Sheep Ck., N bank.	2021_09_02
2021_13	**RM1402**	442008	7410071	551	rock sample (outcrop)	0.5 m chip perpendicular to bedding. Base of cliff. Dark grey, medium to dark grey weathering, moderately hard, moderately fissile, calcareous shale. Strong pervasive reaction to dilute HCl. Graptolites moderately common (noted mainly in talus below outcrop). A 12 cm thick bed of massive (unfoliated) dark grey, light to medium grey weathering limestone (strong, pervasive HCl reaction) occurs ~3 m up section from sample site.	358°/32°W	Road River Group	116I/16. E branch of Sheep Ck., N bank.	2021_09_02
2021_14	**RM1403**	441984	7410068	551	rock sample (outcrop)	0.5 m chip perpendicular to bedding. Base of cliff. Medium grey, light to dark grey weathering, moderately fissile, calcareous shale. Strong pervasive reaction to dilute HCl.	348°/30°W	Road River Group	116I/16. E branch of Sheep Ck., N bank.	2021_09_02
2021_15	**RM1404**	441955	7410067	551	rock sample (outcrop)	0.5 m chip perpendicular to bedding. Base of cliff. Dark grey, dark grey weathering, moderately hard, moderately fissile calcareous shale. Strong pervasive dilute HCl reaction. 0.5 to 1% white calcite veinlets.		Road River Group	116I/16. E branch of Sheep Ck., N bank.	2021_09_02
2021_16	**RM1405**	441933	7410058	557	rock sample (outcrop)	0.5 m chip perpendicular to bedding. Base of cliff. Dark grey, dark grey weathering, moderately hard, moderately fissile, calcareous shale. Strong pervasive reaction to dilute HCl. One 15 cm thick, dark grey, medium to dark grey weathering limestone bed 3 m up section from sample site (strong, pervasive HCl reaction).	338°/28°W	Road River Group	116I/16. E branch of Sheep Ck., N bank.	2021_09_03
2021_17	**RM1406**	441912	7410042	560	rock sample (outcrop)	0.5 m chip perpendicular to bedding. Base of cliff. Dark grey, dark grey weathering, moderately hard, moderately fissile calcareous shale. Moderate, spotty reaction to dilute HCl.	350°/30°W	Road River Group	116I/16. E branch of Sheep Ck., N bank.	2021_09_03
2021_18	**RM1407**	441886	7410049	551	rock sample (outcrop)	0.5 m chip perpendicular to bedding. Base of cliff. Dark grey, dark grey weathering, moderately hard, moderately fissile, calcareous shale. Moderate spotty reaction to dilute HCl.		Road River Group	116I/16. E branch of Sheep Ck., N bank.	2021_09_03

Rock Site #	Sample	East	North	Elev (m)	Feature	Description	Bedding Attitude	Unit	Notes	Date
2021_19	**RM1408**	441862	7410036	550	rock sample (outcrop)	0.5 m chip perpendicular to bedding. Base of cliff. Black, black weathering, moderately fissile, moderately soft, calcareous shale. Very weak to moderate, spotty reaction to dilute HCl. Unit is distinctive due to its black weathering. Rock is somewhat 'sooty' - probably graphitic.		Road River Group	116I/16. E branch of Sheep Ck., N bank.	2021_09_03
2021_20	**RM1409**	441836	7410031	549	rock sample (outcrop)	0.5 m chip perpendicular to bedding. Base of cliff. Dark grey, dark grey weathering, moderately hard, no HCl reaction, blocky to weakly fissile, abundant fractures perpendicular to bedding, very competent (hard to break). Very different from samples sites RM1401 to RM1408. About 50% of the outcrop covered by a stain (veneer) that is white to medium yellow to medium rusty brown. The rock occurs in massive (non-foliated) beds commonly 1 to 10 cm thick that tend to hold together. These are separated by strongly fissile shale partings up to 5 cm thick. Overall the rock is a non-calcareous shale with a well bedded appearance.	330°/30°W	Canol Formation	116I/16. E branch of Sheep Ck., N bank.	2021_09_03
2021_22	**RM1410**	441814	7410022	554	rock sample (outcrop)	0.5 m chip perpendicular to bedding. Base of cliff (on floodplain). Dark grey, dark grey weathering, moderately hard, weakly fissile to blocky, non-calcareous shale. No reaction to dilute HCl. Beds 1 to 12 cm thick, some weakly fissile, shale partings. There is a 4 cm thick bed within the sampled interval of black, black weathering, very soft, crumbly shale (probably graphitic). Local rusty brown Fe-oxide stain on outcrop. Local, minor occurrence of yellow coating (aphanitic, somewhat botryoidal) on and near soft shale layer (possibly jarosite).	355°/24°W	Canol Formation	116I/16. E branch of Sheep Ck., N bank.	2021_09_03
2021_23	**RM1411**	441782	7410014	542	rock sample (outcrop)	0.5 m chip perpendicular to bedding. Base of cliff just above water. Dark grey, dark grey weathering, moderately hard, weakly fissile, calcareous shale. Moderate to strong, spotty to pervasive reaction to dilute HCl. Bedded at 1 to 15 cm scale with fissile shale partings.		Canol Formation	116I/16. E branch of Sheep Ck., N bank.	2021_09_04

Rock Site #	Sample	East	North	Elev (m)	Feature	Description	Bedding Attitude	Unit	Notes	Date
2021_24	**RM1412**	441752	7410001	544	rock sample (outcrop)	0.5 m chip perpendicular to bedding. Base of cliff near creek level. Medium grey, medium grey weathering, moderately hard, non-calcareous shale. No dilute HCl reaction. 10 to 30% yellow-brown Fe-oxide stain.	350°/26°W	Canol Formation	116I/16. E branch of Sheep Ck., N bank.	2021_09_04
2021_26	**RM1413**	441736	7409984	547	rock sample (outcrop)	0.5 m chip perpendicular to bedding. Base of cliff. Dark grey, dark grey weathering, moderately hard, weakly fissile calcareous shale. Moderate spotty HCl reaction. Shale is bedded (1 to 5 cm) with fissile shale partings. Apx. 5% black, black weathering chert in beds up to 8 cm thick containing numerous calcite veinlets. Chert also occurs locally as discontinuous lenses in shale.	336°/26°W	Canol Formation	116I/16. E branch of Sheep Ck., N bank.	2021_09_04
2021_27	**RM1414**	441717	7409971	550	rock sample (outcrop)	0.5 m chip perpendicular to bedding. Base of cliff. Dark grey weathering, moderately hard, weakly fissile, calcareous shale. Strong pervasive reaction to dilute HCl. 1 to 4 cm beds with fissile partings. 5 to 15% black, black weathering chert beds with numerous (5 to 10%) calcite veinlets. Chert beds are up to 7 cm thick.	004°/25°W	Canol Formation	116I/16. E branch of Sheep Ck., N bank.	2021_09_04
2021_28	**RM1415**	441700	7409966	547	rock sample (outcrop)	0.5 m chip perpendicular to bedding. Base of cliff (cliff is only about 6 m high at this location). Dark grey, medium to dark grey weathering, moderately hard, weakly fissile to blocky. No HCl reaction except along hairline calcite veinlets. Non-calcareous shale. Possible trace amount of malachite (included in sample). 1 to 5 cm bedding (shale) with fissile shale partings. 1 to 2% black, black weathering chert with no HCl reaction except along calcite veinlets. The chert occurs in beds up to 4 cm thick (not included in sample). Local, minor amounts of reddish brown Fe-oxide stain on outcrop.	346°/22°W	Canol Formation	116I/16. E branch of Sheep Ck., N bank.	2021_09_04
2021_29	**RM1416**	441680	7409954	546	rock sample (outcrop)	0.5 m chip perpendicular to bedding. ~ 1 m vertical section just above flood plain and ~3 m from western limit of outcrop exposure. Dark grey, dark grey weathering, moderately hard, weakly fissile to blocky, no HCl reaction. Non-calcareous shale. Local, weak, orange-brown Fe-oxide stain.	342°/32°W	Canol Formation	116I/16. E branch of Sheep Ck., N bank.	2021_09_04

Rock Site #	Sample	East	North	Elev (m)	Feature	Description	Bedding Attitude	Unit	Notes	Date
2021_30	**RM1417**	441564	7409951	547	rock sample (outcrop)	0.5 m chip perpendicular to bedding. Near base of outcrop and talus slope about 25 m north of Sheep Creek. Lowest stratigraphic level on this outcrop exposure. Dark grey, dark grey weathering, hard, weakly fissile to blocky, no HCl reaction, non-calcareous shale. Bedded at 1 to 12 cm thicknesses with fissile shale partings. Very thin coating (stain) of medium yellow material (jarosite?) is common.	356°/25°W	Canol Formation	116I/16. E branch of Sheep Ck., N bank.	2021_09_04
2021_31	**RM1418**	441548	7409961	546	rock sample (outcrop)	0.5 m chip perpendicular to bedding. ~ 10 m higher (elevation) than RM1417 at top of ~ 10 m talus slope below steep outcrop. Dark grey, dark grey weathering, hard, weakly fissile to very blocky, non-calcareous shale. No reaction to dilute HCl. Pale yellow stain (jarosite?) is common. Non-fissile (massive) beds 1 to 10 cm thick are separated by fissile shale partings.	358°/26°W	Canol Formation	116I/16. E branch of Sheep Ck., N bank.	2021_09_04
2021_32	**RM1419**	441524	7409957	551	rock sample (outcrop)	0.5 m chip perpendicular to bedding. Top of ~ 10 m talus slope at base of ~ 10 m cliff. Dark grey, dark grey weathering, hard, weakly fissile, very blocky, non-calcareous shale. Beds are 1 to 7 cm thick with fissile shale partings. Thin coating of pale, medium yellow jarosite (?) is common. Abundant fractures perpendicular to bedding.	005°/28°W	Canol Formation	116I/16. E branch of Sheep Ck., N bank.	2021_09_04
2021_33	**RM1420**	441502	7409956	548	rock sample (outcrop)	0.5 m chip perpendicular to bedding. Near west end of exposed outcrop exposure. Medium to dark grey, dark grey weathering, hard, no dilute HCl reaction, moderately to strongly fissile, forms thin, platy talus, distance between partings varies from ~ 2 mm to 2 cm, Medium reddish brown, Fe-oxide stain is common. Upper 20 cm of sample interval immediately below overburden is burnt - parting surfaces and fractures are bright orange-red while rock between partings is 'bleached' to light grey. The red material on the parting planes and fractures is like an ochre and turns fingers, hammer, pants etc. a red colour.	012°/28°W	Canol Formation	116I/16. E branch of Sheep Ck., N bank.	2021_09_04

Rock Site #	Sample	East	North	Elev (m)	Feature	Description	Bedding Attitude	Unit	Notes	Date
2021_34	**RM1421**	441746	7409277	581	rock sample (outcrop)	0.5 m chip perpendicular to bedding. About 2 m from south end of outcrop exposure, Dark grey, dark grey weathering shale, very soft, crumbly, weakly to moderately fissile, very weak spotty reaction to dilute HCl. Calcareous shale.		Road River Group	116I/16. S branch of Sheep Ck., W bank.	2021_09_05
2021_35	**RM1422**	441736	7409298	578	rock sample (outcrop)	0.5 m chip perpendicular to bedding. Dark grey, dark grey weathering, soft, weakly to moderately fissile, crumbly shale with one moderately hard, 2 cm thick carbonate bed near centre of sample interval containing 1 to 3% disseminated pyrite.		Road River Group	116I/16. S branch of Sheep Ck., W bank.	2021_09_05
2021_36	**RM1423**	441732	7409320	568	rock sample (outcrop)	0.5 m chip perpendicular to bedding. Dark grey, dark grey weathering, weakly to moderately fissile, very soft, crumbly, calcareous shale. Weak to moderate reaction to dilute HCl - spotty and on foliation planes.		Road River Group	116I/16. S branch of Sheep Ck., W bank.	2021_09_05
2021_37	**RM1424**	441720	7409343	565	rock sample (outcrop)	0.5 m chip perpendicular to bedding. Dark grey, dark grey weathering, soft, moderately crumbly, weakly to moderately fissile. Calcareous shale. Very weak spotty reaction to dilute HCl. 1 to 2% fine grained disseminated gypsum. Sample collected immediately above a 65 cm thick carbonate bed.	340°/40°N	Road River Group	116I/16. S branch of Sheep Ck., W bank.	2021_09_05
2021_38	**RM1425**	441710	7409366	562	rock sample (outcrop)	0.5 m chip perpendicular to bedding. Dark grey, dark grey weathering, soft, weakly to moderately fissile, crumbly, calcareous shale. Very weak spotty reaction to dilute HCl.	000°/30°W	Road River Group	116I/16. S branch of Sheep Ck., W bank.	2021_09_05
2021_39	**RM1426**	441698	7409392	555	rock sample (outcrop)	0.5 m chip perpendicular to bedding. Dark grey, dark grey weathering, soft, crumbly, moderately fissile, calcareous shale. Very weak spotty reaction to dilute HCl. 1 to 3% white, fine grained, disseminated gypsum - mainly on parting planes.	348°/22°W	Road River Group	116I/16. S branch of Sheep Ck., W bank.	2021_09_05
2021_40	**RM1427**	441687	7409414	546	rock sample (outcrop)	0.5 m chip perpendicular to bedding. Dark grey, dark grey weathering, soft, crumbly, moderately fissile, calcareous shale. Very weak spotty reaction to dilute HCl. Two narrow (1 and 2 cm thick) carbonate beds containing 1 to 3% disseminated pyrite occur and are included in sample.		Road River Group	116I/16. S branch of Sheep Ck., W bank.	2021_09_05

Rock Site #	Sample	East	North	Elev (m)	Feature	Description	Bedding Attitude	Unit	Notes	Date
2021_41	**RM1428**	441673	7409434	546	rock sample (outcrop)	0.5 m chip perpendicular to bedding. Dark grey, dark grey weathering, soft, crumbly, weakly to moderately fissile, calcareous shale. Very weak spotty reaction to dilute HCl.	314°/20°SW	Road River Group	116I/16. S branch of Sheep Ck., W bank.	2021_09_05
2021_42	**RM1429**	441663	7409464	548	rock sample (outcrop)	0.5 m chip perpendicular to bedding. Dark grey, dark grey weathering, soft, crumbly, moderately fissile, calcareous shale. Very weak spotty reaction to dilute HCl. 1 to 2% fine grained gypsum along parting planes.	330°/22°W	Road River Group	116I/16. S branch of Sheep Ck., W bank.	2021_09_05
2021_01	no sample	443325	7389034	736	outcrop / subcrop	Small, poorly exposed outcrop about 1 m x 1 m in size. Dark grey to black, very hard (siliceous) shale / cherty shale. Weathers medium to dark grey. Moderately blocky to weakly fissile (nearby rubble). Very minor amount (<0.25 to 0.5%) aphanitic, medium yellow coating on nearby rubble (jarosite?).	334°/58°W	Canol Formation	116I/09.	2021_08_19
2021_02	no sample	443794	7389268	782	outcrop	Apx. 50 x 15 m area of fairly continuous outcrop trending 350°. Moderately to strongly fissile, medium grey, medium grey weathering, calcareous shale. Appears to be thinly bedded with beds up to 1 cm thick in areas of moderate fissility. Nil to very weak spotty reaction to dilute HCl.	350°/44°W	Road River Group	116I/09.	2021_08_21
2021_03	no sample	443848	7389145	805	outcrop	Apx. 30 m x 10 m outcrop trending 346°. Medium grey, medium grey weathering, moderately to strongly fissile calcareous shale. Areas that exhibit moderate fissility appear thinly bedded (up to 1 cm). Very weak to weak fracture controlled and spotty reaction to dilute HCl.	346°/36°W	Road River Group	116I/09.	2021_08_21
2021_04	no sample	443430	7388646	735	outcrop	Apx. N-S trending outcrop (parallel to strike) about 25 m long and 1 m wide along top of knob (near north end). ~75% black chert in beds up to 7 cm thick, weathering varies from black to dark grey to light grey. ~25% black, very hard (siliceous) shale (cherty shale), weakly to moderately fissile, light grey weathering. Overall outcrop is cherty shale (grading into chert).	336°/56°W	Canol Formation	116I/09.	2021_08_22

Rock Site #	Sample	East	North	Elev (m)	Feature	Description	Bedding Attitude	Unit	Notes	Date
2021_05	no sample	443439	7390116	755	boulders	Apx. 20 m south of sample site RM1248 are 2 small (~3 m x 1 m) bodies of rock that look like outcrop but the dips are 'wrong' (320°/66°E). Mainly dark grey, moderately to strongly fissile shale, platy, no dilute HCl reaction (similar to scree at RM1248 sample site). However, there are also beds up to 4 cm thick of light to medium grey, moderately hard limy shale /limestone with very weak spotty reaction to dilute HCl. The more northerly rock is about 3 m to the north. These may be rotated blocks near source.		Road River Group	116I/09.	2021_08_23
2021_06	no sample	443499	7390168	779	outcrop	Small, poorly exposed outcrop (~8 m x 1 m) elongate apx. N-S (parallel to strike). Light grey, moderately hard, weakly fissile, light grey weathering, nil to very weak spotty and fracture-controlled reaction to dilute HCl. Calcareous shale.	334°/72°W	Road River Group	116I/09.	2021_08_23
2021_07	no sample	444632	7387286	752	outcrop	Four small rock exposures up to 1 m cross (each) on the south side of stream. All have similar attitudes suggesting these are outcrops (exposures occur over ~5 m of stream bank). ~ 40% black, black weathering chert. ~ 40% medium grey, light grey weathering limestone beds (very strong, pervasive reaction to dilute HCl). ~ 20% dark grey, dark grey weathering calcareous shale (weak to moderate, spotty reaction to dilute HCl), weakly to moderately fissile, poorly exposed (could form more than 20% of the bedrock). Alternating chert and limestone in beds up to 9 cm thick (both), shale occurs in beds up to 20 cm (+) thick.	334°/62°W	Road River Group	116I/09.	2021_09_01
2021_08	no sample	443887	7387342	703	boulder	Small outcrop (~ 2 x 1 m) on south side of creek. Dark grey, dark grey weathering, strongly calcareous (very strong dilute HCl reaction) weakly fissile to non-fissile, limestone / calcareous shale.		Road River Group	116I/09. Strike is odd (008°/66°W) - probably a slumped block.	2021_09_01

Rock Site #	Sample	East	North	Elev (m)	Feature	Description	Bedding Attitude	Unit	Notes	Date
2021_09	no sample	443929	7387368	705	outcrop	Dark grey, dark grey weathering, weak spotty dilute HCl reaction to strong pervasive dilute HCl reaction, 1 to 4 cm thick, competent, non-fissile, limy beds separated by <5 mm shale partings. Overall rock is a calcareous shale or shaly limestone. Outcrop is ~ 1.5 x 1.5 m on south bank of stream. 'S' fold visible (inclined 'S'). Centre limb is ~ horizontal (~ 280°/24°S), West limb dips at a moderately steep angle to west but is very poorly exposed. East limb attitude is ~ 338°/62°W. Fold hinge has ~ 24° plunge to 170°.		Road River Group	116I/09.	2021_09_01
2021_10	no sample	444009	7387370	703	outcrop	Outcrop is 10 m (+) across with an apx. 4 m waterfall. Mainly dark grey, medium grey weathering limestone. Moderate to strong, pervasive reaction to dilute HCl. Limestone beds are up to 20 cm thick. About 5% of outcrop consists of dark grey, calcareous shale beds up to 15 cm thick (moderate to strong reaction to dilute HCl). Much of the outcrop is covered by a medium orange-brown, Fe-oxide stain.	334°/66°W	Road River Group	116I/09.	2021_09_01
2021_11	no sample	443762	7387296	697	outcrop	Outcrop is ~ 4 m across on south side of stream. Very hard (siliceous), no dilute HCl reaction, black to dark grey, dark grey weathering. Nearby rubble is weakly fissile to very blocky). Very siliceous (cherty) shale with 1 to 5 cm beds. Overturned folded with fold hinge plunging 50° to 115°. East limb at 340°/80°W (locally these beds are near vertical). West limb at 335°/24°S.		Canol Formation	116I/09.	2021_09_01
2021_21	no sample	441832	7410024	547	outcrop	Base of cliff just above river level (by about 1 m) - no talus slope. Dark grey, light grey to white weathering, very fine grained, crystalline limestone concretion. Very strong, pervasive reaction to dilute HCl. The concretion is at least 1.5 m horizontal by 0.6 m high (base is covered). The concretion deflects layering in overlying shale forming a small anticline with ~ 0.3 m amplitude.			116I/16. E branch of Sheep Ck., N bank.	2021_09_03
2021_25	no sample	441736	7409990	547	outcrop	Large limestone concretion - dark grey, dark to medium grey weathering, very strong reaction to dilute HCl. Apx. 4 m (parallel to bedding) x 2 m. Deflects bedding above and below.			116I/16. E branch of Sheep Ck., N bank. Within Canol Formation.	2021_09_04

Rock Site #	Sample	East	North	Elev (m)	Feature	Description	Bedding Attitude	Unit	Notes	Date
2021_43	no sample	444286	7385363	713	rubble	Linear zone 0.5 to 1 m wide trending 340° parallel to local topography (minor ridge) of large limestone blocks up to 25 cm across. Light to medium grey, medium grey weathering, some surfaces show layering (laminae to thin beds (up to 1 cm thick). Very blocky. The linear trend of limestone rubble occurs along the ridge top.			116I/09.	2021_09_09
2021_44	no sample	442950	7391005	828	outcrop	Near north end of extensive outcrop area up to 25 m (+) wide extending ~ 25 m in a northerly direction (toward 344°; strike direction) and 200 (+) m in a southerly direction from this location. Medium grey, light grey weathering (to very locally orangey brown weathering), moderately to strongly fissile. Forms platey scree. Moderate spotty to pervasive reaction to dilute HCl. Calcareous shale. Tends to separate on parting planes 2 mm to 2 cm apart.	344°/60°W	Road River Group	116I/09.	2021_09_10

Appendix 2

Stream Silt Sample Descriptions

Location Coordinates: UTM Zone 8W, NAD83

Sample	East	North	Elevation (metres)	Flow Direction	Description	Notes	Collection Date
RM1601	444881	7387370	766	225°	Stream is ~ 1.5 m wide and 10 cm deep with fast flow. Rocky bottom. Sample composition by volume: 10 to 20% dark grey silt to gravel (most gravel removed from sample), 80 to 90% moss mat (collected just above current flow). Abundant black, black weathering chert and dark grey, medium grey weathering limestone along with a minor amount of limestone breccia. Surface water flow ends ~ 20 m upstream (i.e. above that all flow is subsurface).	Mount Hare property area.	2021_09_01
RM1602	444804	7387307	757	340°	Tributary ~25 m south of main stream. Moderate to fast flow. ~0.5 m wide and 5 cm deep. Stream starts ~5 m upstream at a vertical, chaotic colluvium bank perpendicular to flow. Water drains down from above (small waterfall) from overlying organic material (largely moss) and is also sourced from seepage through the colluvium. Sample composition by volume: 10 to 20% dark grey, silt to gravel (most gravel removed from sample) and 80 to 90% moss mat.	Mount Hare property area.	2021_09_01
RM1603	444674	7387309	751	270°	~ 0.4 m wide and 20 cm deep, fast flow, pebble bottom. Sample is 100% moss mat collected just below current flow.	Mount Hare property area.	2021_09_01
RM1604	444434	7387286	736	250°	~ 1.0 m wide and 20 cm deep, fast flow, stone bottom with boulders etc. Sample is 100% moss mat.	Mount Hare property area.	2021_09_01
RM1605	444219	7387241	721	245°	~ 2.0 m wide, 20 cm deep, moderate to fast flow, pebble to gravel bottom. Sample is 100% moss mat.	Mount Hare property area.	2021_09_01
RM1606	443887	7387342	706	230°	~ 2.0 m wide, 10 cm deep, moderate to fast flow, pebble to gravel bottom. Limestone / shale outcrop on south bank. Sample composition by volume: 20-25% dark grey, silt to gravel (most gravel removed), 75 to 80% moss mat. All sample material collected from small, midstream 'island'.	Mount Hare property area.	2021_09_01

Appendix 3

Soil and Scree Sample Descriptions

Location Coordinates: UTM Zone 8W, NAD83

- “LAV” refers to low (ground hugging) alpine vegetation (e.g. mosses, lichens, grasses, shrubs).
- “Fines” is used to indicate clay to very coarse sand. If fine grained organic material is present it is included in the Fines (%) estimate.
- “Fragments” is used to indicate clasts larger than very coarse sand.
- Fragments >1 cm across were removed from the sampled material.

Sample	East	North	Elev (m)	Slope	LAV (%)	Depth (cm)	Sample Colour	Type	Fines (%)	Scree Description	Notes	Date
RM1201	443230	7389002	699	gentle W	100	30 to 40	dark grey	soil	70 to 80 (silty)	Surface: Moderately to strongly fissile, dark grey to black shale. Non-calcareous. Commonly up to 2 cm across.	Mount Hare property area. 20 to 25 cm Ah. Possibly 5 to 10% organics in fine grained material.	2021_08_19
RM1202	443258	7388995	702	gentle to moderate W	100	30 to 40	dark grey	soil / scree	40 to 60 (silty)	Surface: Moderately blocky to moderately fissile, dark grey to black, hard (siliceous) shale. Non-calcareous. Some pieces up to 5 cm across but most are < 2 cm across.	Mount Hare property area. 30 cm Ah. Possibly 1 to 5% organics in fine grained material.	2021_08_19
RM1203	443288	7388994	709	moderate to steep W	99	30	medium brown	soil	50 to 70 (silt and minor amount of very fine sand)	Surface: Dark grey to black, moderately blocky to strongly fissile, moderately hard shale. Weathers medium to dark grey. Non-calcareous. Most pieces <2 cm across but some up to 4 cm across.	Mount Hare property area. 5 cm Ah.	2021_08_19
RM1204	443312	7389012	720	moderate to steep W	2	25 to 35	medium (orangey) brown	scree	5 to 10 (silty)	Surface: Mainly dark grey to black, non-calcareous, moderately blocky to moderately fissile, hard (siliceous) shale. Most pieces are < 5 cm across. Laminae are visible on some weathered surfaces. 1 to 3% black chert fragments from beds up to 1 cm thick. Very minor amount (< 0.25%) aphanitic, yellow stain of some fragments.	Mount Hare property area. 20 to 40% black lichen on scree. Colour due to Fe oxidation of fine grained material.	2021_08_19
RM1205	443334	7389023	735	apx. level	2	15 to 20	medium grey	scree	5 to 10 (silty)	Surface: Mainly dark grey to black, light grey weathering, very hard (siliceous) shale (cherty shale ?). Laminae are visible on some weathered surfaces. Non-calcareous. Most pieces are < 5 cm across with a minority of pieces up to 10 cm across. 5 to 10% black chert from beds up to 2 cm thick.	Mount Hare property area. At top of knob. About 50% black lichen on scree.	2021_08_19

Sample	East	North	Elev (m)	Slope	LAV (%)	Depth (cm)	Sample Colour	Type	Fines (%)	Scree Description	Notes	Date
RM1206	443363	7389022	731	moderate E	50	25 to 35	black	soil / scree	60 to 80 (silty)	Surface: Dark grey to black, moderately hard, weakly blocky to moderately fissile shale. Most pieces are < 2 cm across with a few up to 5 cm across. Laminae visible on some weathered surfaces. Non-calcareous. 2-5% black, black weathering chert from beds up to 3 cm thick.	Mount Hare property area. 20 to 40% black lichen on scree.	2021_08_19
RM1207	443388	7389027	728	very gentle E to level	70	25 to 35	black	soil	90 to 95 (silty)	Surface: Dark grey, weathers medium to dark grey, moderately blocky to moderately fissile, non-calcareous shale. 1-2% black chert from beds up to 2 cm thick. A small percentage of scree shale fragments display reddish brown (hematitic) weathering.	Mount Hare property area.	2021_08_19
RM1208	443413	7389030	728	level to very gentle W	95	20 to 30	black	soil	95 to 98 (silty)	Pit: Moderately blocky to moderately fissile, dark grey, moderately hard, non-calcareous shale. Fragments up to 2 cm across. Surface: Moderately blocky to moderately fissile, dark grey, weathers medium to dark grey, moderately hard, non-calcareous shale. Most pieces are < 3 cm across.	Mount Hare property area.	2021_08_19
RM1209	443438	7389040	732	gentle W	50	20 to 25	dark grey to black	scree	5 to 10 (silty)	Surface: Medium grey, weathers light to medium grey, moderately hard, moderately blocky to moderately fissile, calcareous shale. Moderate to strong reaction to dilute HCl. Scree fragments are up to 15 cm across but most are < 5 cm across. Some surfaces have a very fine grained, crystalline appearance. 1-3% black chert from beds up to 2 cm thick.	Mount Hare property area. About 5% black lichen on scree.	2021_08_19
RM1210	443462	7389047	733	gentle E	60	20 to 30	dark grey	scree	5 to 10 (silty)	Surface: Medium grey, light to medium grey weathering, moderately block to moderately fissile, moderately hard, non-calcareous shale. Most pieces < 2 cm across but some up to 5 cm across. No chert noted.	Mount Hare property area. 0 to 5% black lichen on scree.	2021_08_19

Sample	East	North	Elev (m)	Slope	LAV (%)	Depth (cm)	Sample Colour	Type	Fines (%)	Scree Description	Notes	Date
RM1211	443484	7389051	736	~ level	100	30 to 40	dark grey to black	soil	70 to 80 (silty)	Pit: Dark grey to black, moderately soft, weakly blocky to moderately fissile, non-calcareous shale. Most pieces < 2 cm across.	Mount Hare property area. Broad saddle.	2021_08_21
RM1212	443507	7389060	732	very gentle W	100	35 to 45	dark grey	soil	97 to 99 (silt to clayey silt)	Pit: Dark grey, weakly to moderately fissile, non-calcareous shale. Shale fragments < 2 cm across.	Mount Hare property area. Possibly 5 to 10% organics.	2021_08_21
RM1213	443532	7389065	730	very gentle W	100	40 to 50	dark grey to black	soil	97 to 99 (silty)	Pit: 1 to 3% moderately hard, dark grey, moderately fissile, calcareous shale fragments. Strong pervasive reaction to dilute HCl. Fragments are up to 3 cm across.	Mount Hare property area. 25 cm Ah. 10 cm of leached material below (B horizon).	2021_08_21
RM1214	443553	7389075	733	gentle W	100	35 to 45	dark grey to black	soil	97 to 99 (silty)	Pit: 1 to 3 % shale fragments up to 2 cm across. Moderately fissile, dark grey, non-calcareous.	Mount Hare property area. 2 cm Ah (small frost heave). 15 cm of leached material (B horizon).	2021_08_21
RM1215	443582	7389086	738	gentle W	100	35 to 45	dark grey to black	soil	99 to 99.5 (silty)	Pit: 0.5 to 1% shale fragments.	Mount Hare property area. 5 cm Ah. 25 cm bleached material (B horizon).	2021_08_21
RM1216	443604	7389091	742	gentle W	100	40 to 50	dark grey	soil	99 to 99.9 (silty)	Pit: 0.1 to 1% fragments.	Mount Hare property area. 5 cm Ah. No leached interval.	2021_08_21
RM1217	443623	7389103	746	gentle to moderate W	100	30 to 40		soil	100 (clayey silt)	Pit: no fragments.	Mount Hare property area. Permafrost at 40 cm. 10 cm Ah. 3 to 5% very small to small roots.	2021_08_21
RM1218	443648	7389113	751	gentle W	100	35 to 45		soil	97 to 99 (silty)	Pit: 1 to 3% fragments up to 2 cm across. Medium grey, moderately blocky to moderately fissile, moderately hard, calcareous shale. Moderate reaction to dilute HCl.	Mount Hare property area. 5 cm Ah.	2021_08_21

Sample	East	North	Elev (m)	Slope	LAV (%)	Depth (cm)	Sample Colour	Type	Fines (%)	Scree Description	Notes	Date
RM1219	443670	7389128	756	gentle to moderate W	100	30 to 40		soil	90 to 95 (silty)	Pit: 5 to 10% fragments up to 2 cm across. Medium grey, moderately soft, weakly blocky to moderately fissile, non-calcareous.	Mount Hare property area. 10 cm Ah.	2021_08_21
RM1220	443693	7389139	759	gentle to moderate W	100	20 to 30	medium greyish brown	soil	60 to 80 (silty)	Pit: 20 to 40% fragments up to 4 cm across. Weakly to moderately fissile, medium grey, moderately hard, non-calcareous.	Mount Hare property area. 10 cm Ah.	2021_08_21
RM1221	443715	7389152	771	gentle to moderate W	80	20 to 30	medium brownish grey	soil	60 to 80 (silty)	Surface: Medium grey, weathers light to medium grey, moderately hard, calcareous shale. Weak spotty reaction to dilute HCl. Most pieces are less than 5 cm across but a few are up to 10 cm across.	Mount Hare property area.	2021_08_21
RM1222	443737	7389159	774	gentle W	100	20 to 30		scree / soil	5 to 10	Nearby surface scree (~ 4 m west): Medium grey, moderately hard shale. Nil to weak reaction to dilute HCl. Mainly weathers medium grey but a minority weathers light grey. Most pieces are < 5 cm across but a few are from cm to >10 cm across.	Mount Hare property area. 10 cm Ah. % small roots.	2021_08_21
RM1223	443762	7389164	778	gentle to moderate W	100	20 to 30	dark grey	scree / soil	40 to 60 (silty)	Pit: 40 to 60% fragments. Medium grey, moderately hard, weakly blocky to moderately fissile shale. Nil to weak spotty reaction to dilute HCl. Pieces up to 5 cm across.	Mount Hare property area. 5 cm Ah.	2021_08_21
RM1224	443791	7389168	785	gentle to moderate W	50	20 to 30	medium to dark brownish grey	scree	5 to 10	Surface: Medium grey, medium grey weathering, moderately hard, weakly blocky to moderately fissile shale. Nil to moderate reaction to dilute HCl. Most pieces are <5 cm across but some are > 10 cm across.	Mount Hare property area. On west side of knob.	2021_08_21

Sample	East	North	Elev (m)	Slope	LAV (%)	Depth (cm)	Sample Colour	Type	Fines (%)	Scree Description	Notes	Date
RM1225	443810	7389185	788	gentle E	30		medium grey	scree	5 to 10	Surface: Moderately fissile, medium grey, calcareous shale. Most weathers medium grey but some weathers light grey. Nil to strong pervasive reaction to dilute HCl. Most pieces <5 cm but some are >10 cm (to a maximum of 30 cm across).	Mount Hare property area. East side of knob. End of traverse. Steep N-S gully ahead (to east).	2021_08_21
RM1226	443187	7388563	686	level to very gentle W	95	15 to 25	dark grey	soil	70 to 80 (silt to clayey silt)	Surface: Most fragments < 2 cm across (a few are up to 4 cm across), weakly blocky to moderately fissile, dark grey, weathers medium grey, hard, no reaction to dilute HCl, shale. No chert noted.	Mount Hare property area. Site is in grassy "flats" containing level vegetation free areas up to 10 m across.	2021_08_22
RM1227	443211	7388560	687	level to very gentle west	90	15 to 25	dark grey	soil	60 to 80 (silt to clayey silt)	Surface: Most fragments < 2 cm across (a few are up to 4 cm), weakly blocky to moderately fissile, dark grey, weathers medium grey, hard shale. No dilute HCl reaction. No chert.	Mount Hare property area. In grassy "flats".	2021_08_22
RM1228	443236	7388555	690	very gentle W	60	20 to 30	medium greyish brown	soil / scree	40 to 60 (silty)	Surface: Most fragments are <3 cm across (a few are up to 5 cm), weakly blocky to moderately fissile, dark grey, light grey weathering, hard to very hard, no dilute HCl reaction. Shale.	Mount Hare property area. About 5% black lichen on rock fragments.	2021_08_22
RM1229	443262	7388569	690	very gentle W	70	20 to 30	black	soil	70 to 90 (silt to clayey silt)	Surface: Dark grey, dark grey weathering, hard, most fragments <3 cm across (a few up to 5 cm), weak to moderately fissile. Shale.	Mount Hare property area.	2021_08_22
RM1230	443287	7388580	695	very gentle W	70	15 to 25	dark grey to black	soil / scree	40 to 60 (silty)	Surface: Most fragments <3 cm across (a few up to 5 cm), weakly blocky to moderately fissile, dark grey, weathers light to medium grey, hard, no dilute HCl reaction. Shale. No chert.	Mount Hare property area.	2021_08_22

Sample	East	North	Elev (m)	Slope	LAV (%)	Depth (cm)	Sample Colour	Type	Fines (%)	Scree Description	Notes	Date
RM1231	443311	7388593	698	very gentle W	60	15 to 25	dark grey to black	soil	50 to 70 (silt to clayey silt)	Surface: Most fragments are <3 cm across (a few up to 5cm), dark grey, light to medium grey weathering, weakly blocky to moderately fissile, moderately hard to hard, no dilute HCl reaction. Shale. No chert.	Mount Hare property area.	2021_08_22
RM1232	443331	7388608	696	gentle W	60	20 to 30	black	soil	90 to 95 (silt to clayey silt)	Surface: Most fragments are <3 cm across (a few are > 5 cm), weakly blocky to moderately fissile, dark grey, medium grey weathering, hard, no dilute HCl reaction. Laminae visible on some weathered surfaces. Shale. No chert.	Mount Hare property area.	2021_08_22
RM1233	443354	7388615	702	gentle to moderate W	100	20 to 30	dark grey to black	soil / scree	40 to 60 (silty)	Pit: Most fragments <3 cm across (a few up to 5 cm), weakly blocky to moderately fissile, dark grey.	Mount Hare property area. 2 to 4% small roots.	2021_08_22
RM1234	443378	7388620	715	moderately steep west	5	40 to 50	medium to dark grey	scree	3 to 7	Surface: 95 to 97% shale - mainly <3 cm across (some >5 cm), very hard (siliceous), moderately blocky to weakly fissile, laminae commonly visible on weathered surfaces, no dilute HCl reaction. 3 to 5% chert, black, black weathering, up to 3 cm thick (original bed thickness).	Mount Hare property area. 1 to 3% black lichen on scree. Upper 25 cm of sample pit is medium brown (oxidized) and somewhat finer grained than sample depth.	2021_08_22
RM1235	443404	7388623	729	moderately steep west	5	30 to 40	medium orange brown (oxidized)	scree	1 to 5	Surface: 95 to 97% shale - most fragments are < 3 cm across (a few are >5 cm), moderately blocky to weakly fissile, dark grey to black, weathers light grey, very hard (siliceous), laminae commonly visible on weathered surfaces, no dilute HCl reaction. 3 to 5% black, black weathering chert, similar size to shale.	Mount Hare property area. Fine grained material, which coats larger fragments, is orange brown. Larger fragments in pit are grey. 2 to 5% black lichen on scree.	2021_08_22

Sample	East	North	Elev (m)	Slope	LAV (%)	Depth (cm)	Sample Colour	Type	Fines (%)	Scree Description	Notes	Date
RM1236	443433	7388616	735	moderate W (W side of knob)	10	20 to 30	medium greyish brown	scree	1 to 5	Surface: 95 to 97% shale - most fragments are <4 cm across (a few are up to 10 cm), moderately blocky to weakly fissile, dark grey to black, weathers light to medium grey, very hard (siliceous), no reaction to dilute HCl, laminae commonly visible on weathered surfaces. 3 to 5% black, black weathering chert fragments up to 3 cm thick.	Mount Hare property area. Black lichen covers 40 to 60% of scree.	2021_08_22
RM1237	443456	7388620	735	moderate E	20	20 to 30	medium grey	scree	1 to 3	Surface: 94 to 96% shale, most fragments < 5 cm across (some up to 10 cm), moderately fissile, platy, dark grey to black, weathers light grey, very hard (siliceous), no dilute HCl reaction. 4 to 6% black, black weathering chert, up to 5 cm thick and 10 cm across.	Mount Hare property area.	2021_08_22
RM1238	443483	7388625	728	gentle to moderate E	70	30 to 40	black	soil	97 to 99 (silt to clayey silt)	Pit: 1 to 3% small shale clasts - moderately soft, black, moderately fissile, no dilute HCl reaction (but only a small number of fragments observed)	Mount Hare property area. Upper 20 cm of pit is scree that probably slid down from above and covered underlying soil (this material contains chert).	2021_08_22
RM1239	443502	7388629	726	gentle E	40	30 to 40	black	soil	97 to 99 (silt to clayey silt)	Pit: 1 to 3% fragments. Moderately fissile, most < 2 cm across, no dilute HCl reaction. Surface: Most fragments <5 cm across (some up to 10 cm), moderately fissile, platy, dark grey to black, weathers light grey, very hard (siliceous) shale, no dilute HCl reaction. 3 to 5% black chert up to 5 cm thick, weathers black.	Mount Hare property area. 1 to 2 cm veneer of abundant fragments (possible down slope movement).	2021_08_22

Sample	East	North	Elev (m)	Slope	LAV (%)	Depth (cm)	Sample Colour	Type	Fines (%)	Scree Description	Notes	Date
RM1240	443527	7388650	718	very gentle E	99	25 to 35	black	soil	98 to 99 (silt to clayey silt)	Pit: 1 to 2% fragments, moderately fissile, black, moderately soft, <2 cm across, no dilute HCl reaction (but only a small number observed).	Mount Hare property area. To the east there is a grassy meadow with permafrost as shallow as 30 cm.	2021_08_22
RM1241	443274	7390045	715	gentle W	100	40	medium grey	soil	85 to 95 (silty)	5-15% fragments (in pit). Dark grey, moderately fissile, moderate hardness, most <2 cm across (up to 3 cm across).	Mount Hare property area. 20 cm Ah.	2021_08_23
RM1242	443298	7390054	721	gentle W	100	40	dark grey	soil	80 to 90 (silty)	10-20% fragments in pit. Most (~95%) are dark grey, weak to moderately fissile shale, moderate hardness, no dilute HCl reaction, most <3 cm across. About 5% are weakly fissile, medium grey, weakly reactive to dilute HCl (spotty and fracture controlled) limestone/limy shale with orange-brown Fe-oxide rinds.	Mount Hare property area. 20 cm Ah.	2021_08_23
RM1243	443317	7390069	726	gentle W	100	40	medium grey	soil	50 to 70 (silty)	30 to 50% fragments in pit. Dark grey, moderately fissile, up to 15 cm across, most <3 cm across, no dilute HCl reaction.	Mount Hare property area. 15 cm Ah.	2021_08_23
RM1244	443342	7390089	737	gentle to moderate W	99	25	medium grey	scree / soil	30 to 50 (silty)	50 to 70% (in pit). Surface: Most fragments are <5 cm across, a few are up to 10 cm across, medium grey, moderately fissile, moderately hard, nil dilute HCl reaction, shale (some pieces have very fine grained orange-brown spots that look like possible Fe-carbonate (no dilute HCl reaction).	Mount Hare property area.	2021_08_23
RM1245	443362	7390094	739	gentle W	100	45	dark grey	soil	50 to 70 (silty)	30 to 50% fragments (in pit). Dark grey, moderately hard, weakly blocky to weakly fissile shale.	Mount Hare property area. 10 cm Ah. Permafrost encountered nearby beneath 30 cm of Ah.	2021_08_23

Sample	East	North	Elev (m)	Slope	LAV (%)	Depth (cm)	Sample Colour	Type	Fines (%)	Scree Description	Notes	Date
RM1246	443378	7390111	745	gentle to moderate W	100	35	medium grey	scree / soil	20 to 40 (silty)	60 to 80% fragments in pit. Dark grey to black, moderately hard, weakly to moderately fissile, up to 10 cm across (most <5 cm across), no dilute HCl reaction.	Mount Hare property area. A few stunted spruce nearby, 15 cm Ah.	2021_08_23
RM1247	443401	7390123	753	gentle W	70	25	medium greyish brown		5 to 15	Surface: Dark grey, moderately hard, moderately fissile, up to 10 cm across, most <5 cm across, no dilute HCl reaction, shale.	Mount Hare property area. A few stunted spruce nearby. The medium greyish-brown colour is from the fines.	2021_08_23
RM1248	443426	7390136	760	gentle W	90	25	medium orangey brown	scree	30 to 50 (silty)	50 to 70% fragments. Surface: Dark grey, moderately hard, moderately fissile, most <3 cm across, a few up to 6 cm across, shale, no dilute HCl reaction. A minor amount of limestone / limy shale with very weak dilute HCl reaction is present in nearby (20 m south) large rubble blocks.	Mount Hare property area. The orangey brown colour is from the fines.	2021_08_23
RM1249	443448	7390145	757	gentle W	40	30	medium (orangey) brown	scree /soil	40 to 60 (silty)	Surface: Moderately fissile, medium grey, moderately hard shale, weathers grey to orangey brown, no dilute HCl reaction.	Mount Hare property area.	2021_08_23
RM1250	443476	7390160	767	very gentle W	100	40	medium grey	scree / soil	10 to 30	Pit: Most fragments are <2 cm across, moderately hard to moderately soft, dark grey, weakly blocky, weakly fissile, no dilute HCl reaction.	Mount Hare property area. 0 to 10 cm: Ah. 10 to 25 cm: medium orangey brown (oxidized) B horizon. Note: weakly calcareous outcrop about 23 m to the E.	2021_08_23
RM1251	441337	7411582	609	very gentle W	100	35	black	soil	93 to 97 (silt to clayey silt)	Pit: 3 to 7% fragments in pit up to 4 cm across. Moderately fissile, dark grey to black, moderately hard, no dilute HCl reaction.	Sheep Creek property area. 10 cm Ah. 3 to 5% small roots.	2021_08_25

Sample	East	North	Elev (m)	Slope	LAV (%)	Depth (cm)	Sample Colour	Type	Fines (%)	Scree Description	Notes	Date
RM1252	441360	7411571	611	very gentle W	100	50	black	soil	100 (silt to clayey silt)	No fragments in pit.	Sheep Creek property area. 0 to 15 cm: Ah. 15 to 30 cm: dark grey brown. 30 to 50 cm : black.	2021_08_25
RM1253	441384	7411570	613	gentle W	100	30	medium grey	scree / (soil)	10 to 20 (silty)	80 to 90% fragments in pit. Up to 6 cm across, weakly to moderately fissile, dark grey to black, moderately hard, no reaction to dilute HCl.	Sheep Creek property area. 10 cm Ah.	2021_08_25
RM1254	441407	7411563	617	very gentle W	98	40	dark grey	soil	96 to 98 (silt to clayey silt)	2 to 4% fragments in pit. Up to 3 cm across, moderately fissile, shale. Surface: Fragments up to 6 cm across, moderately fissile, dark grey, moderately hard, no dilute HCl reaction.	Sheep Creek property area.	2021_08_25
RM1255	441436	7411552	624	gentle W	70	35	medium brownish grey	scree	1 to 3	97 to 99% fragments in pit. Up to 10 cm across, moderately fissile shale. Surface: Fragment up to 15 cm across, moderately fissile (platy), dark grey to black, hard, no dilute HCl reaction, medium grey weathering.	Sheep Creek property area. Fines oxidized down to 25 cm with minor oxidation from 25 to 35 cm.	2021_08_25
RM1256	441455	7411544	624	gentle W	60	30	medium grey	scree	1 to 3	Surface: Fragments up to 6 cm across, moderately fissile / platy, dark grey to black, medium grey weathering, hard, no dilute HCl reaction.	Sheep Creek property area. Fines are oxidized (medium orange brown) to 20 cm.	2021_08_25
RM1257	441477	7411539	626	~ level	95	40	black	soil	97 to 99 (silt to clayey silt)	Pit: 1 to 3% fragments up to 2 cm across, moderately fissile, dark grey to black, moderately hard, no dilute HCl reaction. Surface: Fragments up to 8 cm across, weakly to moderately fissile, moderately hard, no dilute HCl reaction.	Sheep Creek property area.	2021_08_25

Sample	East	North	Elev (m)	Slope	LAV (%)	Depth (cm)	Sample Colour	Type	Fines (%)	Scree Description	Notes	Date
RM1258	441506	7411544	629	very gentle W	95	30	dark grey to black	soil	97 to 99 (silty to clayey silt)	Surface: 99 to 99.5%: Fragments up to 8 cm across, weakly to moderately fissile, dark grey, weathers medium grey, moderately hard, no dilute HCl reaction. 0.5 to 1%: Black, black weathering chert fragments from beds up to 5 cm thick.	Sheep Creek property area.	2021_08_25
RM1259	441531	7411529	637	gentle to moderate W	30	30	medium orangey brown	scree	3 to 5	Pit: 95 to 97% fragments. Surface: Mainly shale fragments up to 6 cm across, weakly to moderately fissile, dark grey, medium grey weathering, moderately hard, no dilute HCl reaction, laminae visible on some weathered surfaces. 3 to 5% black, black weathering chert fragments from beds up to 6 cm thick.	Sheep Creek property area. 20 to 40% black lichen coverage. Orangey brown colour from oxidation of fines.	2021_08_25
RM1260	441554	7411517	638	level to gentle W	20	25	medium orangey brown.	scree	1 to 3	Surface: 95 to 97% shale fragments up to 6 cm across, moderately fissile, dark grey, medium grey weathering, moderately hard, no dilute HCl reaction, laminae visible on some weathered surfaces. 3 to 5% black, black weathering chert fragments from bed up to 4 cm thick.	Sheep Creek property area. 10 to 30% black lichen coverage. Fines are oxidized.	2021_08_25
RM1261	441579	7411513	640	gentle W to level	70	30	dark grey	soil / scree	40 to 60 (silty)	Surface: 99 to 99.5% shale fragments up to 12 cm across, moderately fissile (platy), dark grey, weathers medium grey, moderately hard, no dilute HCl reaction. 0.5 to 1% black, black weathering chert up to 2 cm across.	Sheep Creek property area. 0 to 3% black lichen	2021_08_25
RM1262	441601	7411501	648	gentle W	70	35	medium grey	scree	3 to 5	Surface: Shale clast up to 10 cm across, moderately fissile (platy), dark grey to black, medium grey weathering, hard, no dilute HCl reaction. No chert.	Sheep Creek property area. Medium orangey brown oxidation to 25 cm.	2021_08_25

Sample	East	North	Elev (m)	Slope	LAV (%)	Depth (cm)	Sample Colour	Type	Fines (%)	Scree Description	Notes	Date
RM1263	441620	7411486	653	gentle W	60	30	dark grey	soil	93 to 97 (silt to clayey silt)	Pit: 3 to 7% shale fragments in pit. Surface: Shale fragments up to 15 cm across, moderately fissile (platy), laminae visible on some weathered surfaces, dark grey to black, weathers medium grey, hard, no dilute HCl reaction. No chert.	Sheep Creek property area.	2021_08_25
RM1264	441642	7411461	653	gentle W	30	35	dark grey to black	scree / soil	40 to 60 (silty)	Surface: 97 to 99% shale fragments up to 9 cm across, weakly blocky to moderately fissile, dark grey, dark grey weathering, hard, no dilute HCl reaction. 1 to 3% black, black weathering chert from beds up to 4 cm thick.	Sheep Creek property area.	2021_08_25
RM1265	441659	7411446	656	gentle W	30	35	black	soil	97 to 99 (silty)	Surface: 93 to 97% shale fragments up to 20 cm across (most <5 cm across), moderately fissile (some platy), dark grey to black, weathers medium grey, hard, no dilute HCl reaction. 3 to 7% black, black weathering chert fragments from beds up to 5 cm thick.	Sheep Creek property area.	2021_08_25
RM1266	441677	7411431	658	gentle N	20	30	dark grey to black	soil	80 to 90 (silty)	Pit: 10 to 20% shale fragments up to 2 cm across. Surface: 98 to 99% shale fragments up to 7 cm across (most < 3 cm across), moderately fissile, dark grey, medium grey weathering, hard, no dilute HCl reaction. 1 to 2% black, black weathering chert fragments from beds up to 5 cm thick.	Sheep Creek property area.	2021_08_26

Sample	East	North	Elev (m)	Slope	LAV (%)	Depth (cm)	Sample Colour	Type	Fines (%)	Scree Description	Notes	Date
RM1267	441706	7411426	658	gentle N	30	40	black	soil	93 to 97 (silty)	Pit: 3 to 7% shale fragments up to 1 cm across. Surface: 98.5 to 99.5% shale fragments up to 12 cm across, moderately fissile, dark grey, medium grey weathering, hard, no dilute HCl reaction. 0.5 to 1.5% black, black to dark grey weathering chert fragments from beds up to 4 cm thick.	Sheep Creek property area.	2021_08_26
RM1268	441725	7411415	660	gentle N	70	30	dark grey to black	soil	85 to 95 (silty)	Pit: 5 to 15% shale fragments up to 3 cm across. Surface: Shale fragments up to 10 cm across (most <3 cm across), weak to moderately fissile, dark grey, medium to dark grey weathering, hard, no dilute HCl reaction. No chert.	Sheep Creek property area.	2021_08_26
RM1269	441751	7411407	660	very gentle N	99.5	35	dark grey	soil	80 to 90 (silty clay)	Pit: 10 to 20% shale fragments up to 5 cm across in pit.	Sheep Creek property area.	2021_08_26
RM1270	441773	7411399	663	~ level	99.5	40	dark grey	soil	70 to 90 (clayey silt)	Pit: 10 to 30% shale fragments up to 6 cm across.	Sheep Creek property area.	2021_08_26
RM1271	441796	7411392	665	gentle W	80	30	medium grey	scree	1 to 5	Surface: Shale fragments up to 8 cm across, moderately fissile, dark grey, medium grey weathering, hard, no dilute HCl reaction.	Sheep Creek property area.	2021_08_26
RM1272	441821	7411390	671	gentle NE	50	20	medium grey	scree	1 to 5	Surface: 98.5 to 99.5% shale, fragments up to 10 cm across (most <4 cm across), moderately fissile, dark grey, medium grey weathering, hard, no dilute HCl reaction. 0.5 to 1.5% dark grey to black, dark grey weathering chert from beds up to 2 cm thick.	Sheep Creek property area. On east side of low knob.	2021_08_26
RM1273	441848	7411386	669	gentle E	70	20	medium greyish brown	scree	1 to 5	Surface: Shale fragments up to 12 cm across, moderately fissile, platy, dark grey to black, light grey weathering, hard, no dilute HCl reaction, No chert.	Sheep Creek property area. Few spruce nearby.	2021_08_26

Sample	East	North	Elev (m)	Slope	LAV (%)	Depth (cm)	Sample Colour	Type	Fines (%)	Scree Description	Notes	Date
RM1274	441870	7411361	665	gentle E	70	30	very dark grey	scree	10 to 20	Pit: Shale clasts up to 3 cm across (most <1 cm across). Surface: 98.5 to 99.5%: shale fragments up to 6 cm across, moderately fissile, dark grey to black, light grey weathering, very hard (siliceous), no dilute HCl reaction. 0.5 to 1.5% dark grey to black, dark grey to black weathering, blocky chert fragments from beds up to 3 cm thick	Sheep Creek property area. Few spruce nearby.	2021_08_26
RM1275	441881	7411332	663	gentle E	50	30	very dark grey	scree	10 to 20	Pit: Shale fragments up to 5 cm across (most <2 cm across). Surface: 98 to 99% shale fragments up to 8 cm across (most <4 cm across), moderately fissile, dark grey, light to medium grey weathering, hard, no dilute HCl reaction. 1 to 2% black, black weathering chert from beds up to 4 cm thick.	Sheep Creek property area. Steep slope begins ~ 5 to 10 m east.	2021_08_26
RM1276	443753	7388608	743	gentle to moderate W	100	40		soil	80 to 90 (silt to clayey silt)	Pit: 10 to 20% moderately fissile shale fragments up to 4 cm across, medium grey, moderately hard, no dilute HCl reaction.	Mount Hare property area. 20 cm Ah. 230 m E of RM1240 (valley with thick Ah and shallow permafrost in between).	2021_08_27
RM1277	443776	7388621	749	moderate W	100	35	dark grey	soil	80 to 90 (silt to clayey silt)	Pit: 10 to 20% moderately fissile shale fragments, weakly blocky to moderately fissile, up to 8 cm across (most fragments <3 cm across), medium grey, hard, no HCl reaction.	Mount Hare property area. 20 cm Ah.	2021_08_27
RM1278	443795	7388634	755	moderate W	100	40	dark grey	soil	80 to 90 (silty)	Pit: 10 to 20% weakly blocky to moderately fissile shale fragments up to 5 cm across, dark grey, moderately hard, no dilute HCl reaction.	Mount Hare property area. 25 cm Ah.	2021_08_27

Sample	East	North	Elev (m)	Slope	LAV (%)	Depth (cm)	Sample Colour	Type	Fines (%)	Scree Description	Notes	Date
RM1279	443820	7388642	761	moderate W	100	40	dark grey	soil	70 to 80 (silty)	Pit: 20 to 30% shale fragments Mainly weakly blocky to moderately fissile, up to 7 cm across (most <3 cm across), medium grey, moderately hard, no dilute HCl reaction. Minority of fragments (10 to 20% ?) are light to medium grey, blocky, slightly vitreous, calcareous shale / limestone with weak spotty reaction to dilute HCl and medium orangey brown Fe-oxide rinds.	Mount Hare property area. 25 cm Ah.	2021_08_27
RM1280	443841	7388652	764	moderate W	100	40	dark grey	soil	60 to 80 (silt to clayey silt)	Pit: 20 to 40% fragments. Mainly shale fragments up to 6 cm across, weakly to moderately fissile, dark grey, moderately hard, no reaction to dilute HCl. Minority (5 to 10% ?) of fragments are light to medium grey, weakly to moderately fissile, up to 3 cm across, calcareous shale with weak, spotty reaction to dilute HCl.	Mount Hare property area. 25 cm Ah.	2021_08_27
RM1281	443868	7388655	777	moderate W	100	40	dark grey	soil	50 to 70 (silt to clayey silt)	Pit: 30 to 50% fragments. Mainly shale fragments up to 7 cm across, weakly to moderately fissile, medium grey, moderately hard, no dilute HCl reaction. Minority (1 to 5% ?) are light grey, weakly to moderately fissile fragments up to 4 cm across with weak, spotty reaction to dilute HCl, calcareous shale, medium orangey brown Fe-oxide rinds up to 3 mm thick.	Mount Hare property area. 25 cm Ah.	2021_08_27

Sample	East	North	Elev (m)	Slope	LAV (%)	Depth (cm)	Sample Colour	Type	Fines (%)	Scree Description	Notes	Date
RM1282	443893	7388667	785	moderate W	99.5	35	medium greyish brown	soil / scree	40 to 60 (silty)	Pit: 40 to 60% fragments. Mainly medium to dark grey, moderately hard, moderately fissile shale fragments up to 5 cm across, no dilute HCl reaction. Minority (5 to 15% ?) of fragments are light grey, moderately hard, weakly to moderately fissile calcareous shale up to 5 cm across with nil to moderate, spotty to pervasive reaction to dilute HCl.	Mount Hare property area. 20 cm Ah.	2021_08_27
RM1283	443917	7388670	786	moderate W	99	30	medium brownish grey	scree / soil	5 to 15 (silty)	Surface: 85 to 95% fragments. Mainly medium to dark grey, medium grey weathering, weakly to moderately fissile, moderately hard shale, no dilute HCl reaction. Minority (5 to 10% ?) of fragments are moderately fissile, up to 20 cm across (rare), light to medium grey, light to medium grey weathering, moderately hard with weak to moderate, spotty to pervasive reaction to dilute HCl.	Mount Hare property area.	2021_08_27
RM1284	443945	7388676	795	moderate W	98	35 cm	medium brownish grey	scree / soil	10 to 30 (silty)	Surface: 70 to 90% fragments. Mainly dark grey, dark grey weathering, moderately hard, weakly to moderately fissile shale fragments up to 10 cm across. Minority (1 to 3%) of fragments are light grey, light grey weathering, up to 5 cm across, weakly to moderately fissile with very weak reaction (where scratched) to dilute HCl - calcareous shale.	Mount Hare property area. 10 cm Ah.	2021_08_27

Sample	East	North	Elev (m)	Slope	LAV (%)	Depth (cm)	Sample Colour	Type	Fines (%)	Scree Description	Notes	Date
RM1285	443966	7388687	806	moderate W	100	30	medium grey	scree	5 to 15 (silty)	Pit: 85 to 95% fragments. Mainly moderately fissile fragments up to 12 cm across, medium grey shale with no dilute HCl reaction, very minor amount (<1%) of pyrite blebs up to 2 mm across noted in some fragments. Minority (5 to 10% ?) of fragments are light to medium grey, moderately fissile, moderately hard, calcareous shale with very weak to weak spotty and fracture controlled reaction to dilute HCl, up to 8 cm across.	Mount Hare property area. 10 cm Ah.	2021_08_27
RM1286	443713	7387529	707	very gentle W	50	20	medium to dark grey	scree	3 to 7 (silty)	Pit: 93 to 97% fragments. Surface: 80 to 90% black, light to medium grey weathering, very hard (siliceous) shale fragments, no reaction to dilute HCl, laminae visible on some weathered surfaces, some surfaces have a <1 mm thick white rind. 10 to 20% blocky, black, black weathering chert fragments from beds up to 6 cm thick,	Mount Hare property area. Near top of small knoll. 70 to 91% black lichen cover.	2021_08_28
RM1287	443730	7387545	711	gentle to moderate W	20	20	medium grey	scree	1 to 5	Surface: Shale fragments up to 30 cm across (most <10 cm across), moderately fissile to platey, black, light grey weathering, very hard (siliceous), some have a <1 mm thick white rind, laminae visible on some weathered surfaces, no reaction to dilute HCl. No chert within ~5 m.	Mount Hare property area. West side of small knoll. 50 to 90% black lichen coverage.	2021_08_28
RM1288	443751	7387561	716	gentle E	5	25	medium to dark grey	scree	1 to 5	Pit: 95 to 99% fragments. Surface: 85 to 95% shale fragments up to 12 cm across (most <3 cm across), weakly blocky to moderately fissile, black, light grey weathering, very hard (siliceous), some with <1 mm thick white rind, no reaction to dilute HCl. 5 to 15% black, black weathering chert fragments from beds up to 6 cm thick.	Mount Hare property area. East side of small knob. 50 to 70% black lichen.	2021_08_28

Sample	East	North	Elev (m)	Slope	LAV (%)	Depth (cm)	Sample Colour	Type	Fines (%)	Scree Description	Notes	Date
RM1289	443770	7387571	712	~ level	98	40	very dark grey	soil	93 to 97 (silty clay)	Surface: Shale fragments up to 6 cm across (most <2 cm across), weakly to moderately fissile, dark grey, dark grey weathering, moderately hard to hard, no dilute HCl reaction.	Mount Hare property area.	2021_08_28
RM1290	443791	7387586	708	very gentle W	99.5	40	very dark grey	soil	97 to 99 (silty clay)	Pit: 1 to 3% shale fragments. Surface: Shale fragments up to 6 cm across (most <3 cm), moderately fissile, dark grey, dark grey weathering, moderately hard to hard, no reaction to dilute HCl.	Mount Hare property area. 1 to 3% small roots.	2021_08_28
RM1291	443818	7387596	716	moderate W	100	30	dark grey	scree / soil	3 to 7 (silty)	Pit: 93 to 97% shale fragments up to 7 cm across (most <4 cm across), moderately fissile, moderately hard, dark grey, no dilute HCl reaction.	Mount Hare property area. 10 cm Ah.	2021_08_28
RM1292	443844	7387605	722	very gentle W	99	30	dark grey	scree / soil	3 to 7	Surface (scree exposure ~0.5 x 0.5 m located 3 m NW of pit): Mainly moderately fissile shale fragments up to 4 cm across, dark brownish grey, light to medium grey weathering, moderately soft. One 6 x 6 x 3 cm fragment noted of very finely crystalline, light to medium grey, moderately hard limestone with strong, pervasive reaction to dilute HCl.	Mount Hare property area. 10 cm Ah.	2021_08_28
RM1293	443869	7387606	721	level to very gentle W	30	30	very dark grey	scree	1 to 5	Surface: Shale fragments up to 6 cm across (most <4 cm across), weakly to moderately fissile, dark grey, light grey weathering, hard, no dilute HCl reaction. No chert or limestone.	Mount Hare property area. 1 to 5% black lichen coverage.	2021_08_28
RM1294	443893	7387614	723	~ level	90	30	very dark grey	scree	5 to 15 (silty)	Surface: Fragments up to 5 cm (most <3 cm), moderately fissile, dark grey, light grey weathering, moderately soft, no dilute HCl reaction, shale. No chert of limestone.	Mount Hare property area.	2021_08_28
RM1295	443916	7387631	723	very gentle W	100	35	very dark grey	soil	93 to 97 (clayey silt)	Pit: 3 to 7% shale clasts up to 3 cm across.	Mount Hare property area. 20 cm Ah.	2021_08_28

Sample	East	North	Elev (m)	Slope	LAV (%)	Depth (cm)	Sample Colour	Type	Fines (%)	Scree Description	Notes	Date
RM1296	443933	7387648	728	gentle W	100	50	dark grey	soil	99.9 (clayey silt)	Pit: One fragment noted (2 cm across).	Mount Hare property area. 20 cm Ah. Possibly some organic material in soil. 5% small roots.	2021_08_29
RM1297	443945	7387668	731	gentle W	100	50	dark grey	soil	98.5 to 99.5 (silty clay)	Pit: 0.5 to 1.5% fragments up to 4 cm across (most <2 cm).	Mount Hare property area. 15 cm Ah. Possibly some organic material in soil. 3 to 5% small roots.	2021_08_29
RM1298	443971	7387682	734	gentle W	100	45	dark grey	soil	99 to 99.5 (silty clay)	Pit: 0.5 to 1% fragments up to 1 cm across.	Mount Hare property area. 10 cm Ah. 3 to 5% small roots.	2021_08_29
RM1299	443987	7387700	740	gentle to moderate W	100	45	very dark grey	soil	99 to 99.5 (clayey silt)	Pit: 0.5 to 1% fragments up to 1 cm across.	Mount Hare property area. 10 cm Ah. Possibly up to 10% organic material in soil. Permafrost encountered nearby at 25 cm depth (beneath moss). 2 to 4% small roots.	2021_08_29
RM1300	444012	7387710	751	moderate W	100	45	dark grey	soil	93 to 97 (clayey silt)	Pit: 3 to 7% fragments up to 5 cm across (most are <1 cm across).	Mount Hare property area. 10 cm Ah. Possibly some organic material in soil. 1 to 3% small roots.	2021_08_29
RM1301	444036	7387715	750	moderate W	100	45	dark grey	soil	99 to 99.5 (clayey silt)	Pit: 0.5 to 1% fragments up to 1 cm across.	Mount Hare property area. 10 cm Ah. 1 to 3% small roots.	2021_08_29

Sample	East	North	Elev (m)	Slope	LAV (%)	Depth (cm)	Sample Colour	Type	Fines (%)	Scree Description	Notes	Date
RM1302	444066	7387731	757	moderate W	100	45	very dark grey	soil	96 to 98 (clayey silt)	Pit: 2 to 4% fragments up to 2 cm across.	Mount Hare property area. 10 cm Ah. 2 to 4% small roots.	2021_08_29
RM1303	444090	7387740	764	moderate W	100	45	dark grey	soil	96 to 98 (clayey silt)	Pit: 2 to 4% fragments up to 3 cm across.	Mount Hare property area. 15 cm Ah. 3 to 5% small roots.	2021_08_29
RM1304	444117	7387752	776	moderate W	100	45	dark grey	soil	96 to 98 (clayey silt)	Pit: 2 to 4% fragments up to 4 cm across (most <1 cm across).	Mount Hare property area. 15 cm Ah. 1 to 3% small roots.	2021_08_29
RM1305	444140	7387761	785	moderate W	100	50	dark grey	soil	97 to 99 (clayey silt)	Pit: 1 to 3% fragments up to 1 cm across.	Mount Hare property area. 15 cm Ah. Possibly some organic material in soil (up to 10% ?). 1 to 3% small roots.	2021_08_29
RM1306	444166	7387763	790	moderate W	100	35	dark grey	soil	85 to 95 (clayey silt)	Pit: 5 to 15% fragments up to 5 cm across (most <1 cm across).	Mount Hare property area. 20 cm Ah. Possibly some organic material in soil (up to 10% ?). 2 to 4% small roots.	2021_08_29
RM1307	444192	7387768	795	moderate W	100	30	dark grey	soil / scree	40 to 60 (silty)	Pit (40 to 60% fragments): ~95% blocky, black chert from beds up to 12 cm across and 5 cm thick, some with white carbonate veinlets that don't react to dilute HCl (Fe-carbonate?). ~5% non-calcareous shale fragments up to 4 cm across.	Mount Hare property area. 15 cm Ah. 0.5 to 1% small roots.	2021_08_29

Sample	East	North	Elev (m)	Slope	LAV (%)	Depth (cm)	Sample Colour	Type	Fines (%)	Scree Description	Notes	Date
RM1308	444218	7387772	800	moderate to steep west	100	30	dark brownish grey	soil / scree	40 to 60 (silty)	Pit (40 to 60% fragments): ~50% black chert from beds up to 7 cm thick, some with white multidirectional veins and veinlets of white carbonate. ~25% dark grey, very fine grained (crystalline), moderately hard limestone, very strong pervasive reaction to dilute HCl, up to 8 cm across. ~25% dark grey, moderately hard, calcareous shale with very weak spotty reaction to dilute HCl.	Mount Hare property area. 15 cm Ah. <1% small roots.	2021_08_29
RM1309	444244	7387785	822	moderate to steep W	80	25	dark grey	soil / scree	40 to 60 (silty)	Surface: Mainly medium to dark grey, dark grey weathering limestone, moderately hard, very strong, pervasive reaction to dilute HCl, one piece noted to contain small shale clasts indicating detrital origin. 1 to 2% black, black weathering chert from beds up to 1 cm thick.	Mount Hare property area. 2 cm Ah. <1% small roots.	2021_08_29
RM1310	442608	7390799	715	gentle W	100	25	medium to dark grey	soil	99 to 99.5 (silty clay)	Pit: 0.5 to 1% fragments, < 1 cm across).	Mount Hare property area. 22 cm Ah. Permafrost at 30 cm. 3 to 5% small roots.	2021_08_31
RM1311	442631	7390814	724	gentle W	100	38	dark grey	soil	99.8 to 99.9 (clayey silt)	Pit: 0.2 to 0.2% fragments, <0.5 cm across (that are not ice).	Mount Hare property area. 35 cm Ah. Permafrost at 40 cm. Possibly up to 10% organics). 1 to 3% small roots.	2021_08_31
RM1312	442649	7390831	731	gentle W	100	28	medium grey	soil	99.8 to 99.9 (silty)	Pit: 0.1 to 0.2% shale fragments, up to 1 cm across.	Mount Hare property area. 15 cm Ah. Permafrost at 30 cm. Possibly up to 10% organics. 3 to 5% small roots.	2021_08_31

Sample	East	North	Elev (m)	Slope	LAV (%)	Depth (cm)	Sample Colour	Type	Fines (%)	Scree Description	Notes	Date
RM1313	442670	7390847	732	gentle to moderate W	100	33	dark grey	soil	89 to 99 (silty)	Pit: 1 to 2% shale clasts, up to 2 cm across, fissile.	Mount Hare property area. 25 cm Ah. Permafrost at 35 cm. Possibly up to 10% organics. 1 to 3% small roots.	2021_08_31
RM1314	442695	7390859	738	gentle to moderate W	100	33	dark grey	soil	97 to 99 (silty)	Pit: 1 to 3% shale (fissile) fragments.	Mount Hare property area. 15 cm Ah. Permafrost at 35 cm. Possibly up to 10% organics. 1 to 2% small roots.	2021_08_31
RM1315	442720	7390864	745	gentle to moderate W	100	35	dark grey	soil	95 to 99 (silty)	Pit: 3 to 5% fragments up to 2 cm across, some fissile (shale), some not.	Mount Hare property area. 15 cm Ah. Spruce trees nearby. 1 to 2% small roots.	2021_08_31
RM1316	443838	7385107	640	very gentle W	50	20	dark grey	scree	3 to 7 (silty)	Pit: 93 to 97% fragments. Surface: Moderately to strongly fissile, platy, fragments up to 10 cm across (commonly up to 5 cm across), very dark grey, light grey weathering, moderately hard, shale. No dilute HCl reaction.	Mount Hare property area. Small area of exposed scree in flats about 200 m west of nearest hill. Sample near western limit of scree. 10 to 30% black lichen coverage. Oxidized to medium brown to 15 cm depth.	2021_09_08

Sample	East	North	Elev (m)	Slope	LAV (%)	Depth (cm)	Sample Colour	Type	Fines (%)	Scree Description	Notes	Date
RM1317	443860	7385121	645	level to very gentle W	20	20	dark grey	scree	3 to 7 (silty)	Surface: 95 to 99% moderately to strongly fissile, fragments up to 8 cm across (commonly up to 5 cm across), up to 3 mm thick (platy), dark grey to black, light grey weathering, moderately hard, no dilute HCl reaction, shale. 1 to 5% dark grey, dark grey weathering, blocky (not fissile) limestone with very strong pervasive reaction to dilute HCl, fragments up to 15 cm across.	Mount Hare property area. 10 to 30% black lichen coverage.	2021_09_08
RM1318	443882	7385129	648	level to very gentle W	10	20	dark grey	scree	3 to 7	Surface: 97 to 99% moderately to strongly fissile, fragments up to 8 cm across (commonly up to 4 cm across), up to 3 mm thick, platy, dark grey to black, light grey weathering, moderately hard, no dilute HCl reaction, shale. 1 to 3% dark grey, dark brownish grey weathering limestone, blocky (not fissile), fragments up to 20 cm across, very strong reaction to dilute HCl.	Mount Hare property area. 5 to 15% black lichen coverage.	2021_09_08
RM1319	443906	7385137	646	~ level	90	35	dark grey	soil	80 to 90 (clayey silt)	Surface: Weakly to moderately fissile, fragments up to 4 cm across (most <2 cm across), dark grey light grey weathering, no dilute HCl reaction, shale. No limestone noted.	Mount Hare property area.	2021_09_08
RM1320	443927	7385152	648	level to very gentle W	90	30	dark grey	soil	80 to 90 (silty)	Surface: Weakly blocky to moderately fissile, fragments up to 5 cm across (most <2 cm across), dark grey to black, light to medium grey weathering, hard, no dilute HCl reaction, shale. No limestone noted.	Mount Hare property area.	2021_09_08

Sample	East	North	Elev (m)	Slope	LAV (%)	Depth (cm)	Sample Colour	Type	Fines (%)	Scree Description	Notes	Date
RM1321	443953	7385154	650	very gentle W	99	35	dark brownish grey to dark grey	soil	85 to 95 (silty)	Surface: 97 to 99% weakly to moderately fissile, fragments up to 8 cm across (most <3 cm across), dark grey, light to medium grey weathering, moderately hard, no dilute HCl reaction, shale. 1 to 3% black, dark grey to black weathering chert, blocky, from beds up to 1.5 cm thick.	Mount Hare property area.	2021_09_08
RM1322	443974	7385154	651	very gentle W	99.8	35		soil	80 to 90 (silty)	Surface: Weakly blocky to moderately fissile, fragments up to 5 cm across (most <2 cm across), very dark grey, light to medium grey weathering, moderately hard, no dilute HCl reaction, shale.	Mount Hare property area.	2021_09_08
RM1323	443994	7385173	653	very gentle W	100	50	dark grey to black	soil	85 to 95 (clayey silt)	Pit: 5 to 15% fragments up to 3 cm across, fissile, shale	Mount Hare property area. 40 cm Ah 0.25 to 0.5% small roots.	2021_09_09
RM1324	444014	7385195	656	very gentle W	100	25	dark grey	soil	50 to 70 (silty)	Pit: 30 to 50% fragments up to 5 cm across (most <2 cm across), blocky to fissile.	Mount Hare property area. 10 cm Ah. Several small spruce nearby.	2021_09_09
RM1325	444036	7385210	663	gentle to moderate W	100	20	dark grey to black	soil	60 to 80 (silty)	Pit: 20 to 40% fragments up to 5 cm across (most <2 cm across), blocky to fissile.	Mount Hare property area. 7 cm Ah. Few spruce downslope (west).	2021_09_09
RM1326	444058	7385221	670	moderate W	97	20	dark grey to black	soil / scree	40 to 60 (silty)	Surface: Fragments up to 6 cm across (most <3 cm across), weakly to moderately fissile, dark grey, light to medium grey weathering, hard, no dilute HCl reaction, shale. Laminae visible on some weathered surfaces.	Mount Hare property area.	2021_09_09

Sample	East	North	Elev (m)	Slope	LAV (%)	Depth (cm)	Sample Colour	Type	Fines (%)	Scree Description	Notes	Date
RM1327	444080	7385228	673	moderate W	60	20	dark grey	scree / soil	5 to 15 (silty)	Surface: 98 to 99%: moderately blocky to weakly fissile, fragments up to 5 cm across (most <2 cm across), very dark grey, light grey weathering, hard (siliceous), no dilute HCl reaction, shale. Laminae visible on some weathered surfaces, 1 to 2% black, black weathering chert from beds up to 2 cm thick.	Mount Hare property area. 10 cm Ah. 5 to 10% black lichen coverage.	2021_09_09
RM1328	444098	7385243	680	moderate W	2	20	dark brownish grey	scree	3 to 7	Surface: 98 to 99%: moderately blocky to weakly fissile, fragments up to 5 cm across (most <2 cm across), black, light grey weathering, very hard (siliceous), laminae visible on some weathered surfaces, no dilute HCl reaction, shale. 1 to 2% black, black weathering chert fragments, from beds up to 4 cm thick (most from beds <2 cm thick).	Mount Hare property area. 10 to 30% black lichen.	2021_09_09
RM1329	444118	7385258	688	moderate W	1 to 7	20	dark grey	scree	3 to 7	Surface: 98 to 99% moderately blocky to weakly fissile, fragments up to 6 cm across (most <3 cm across), black, light grey weathering, very hard (siliceous), no dilute HCl reaction, shale, laminae visible on some weathered surfaces. 1 to 2% black, black weathering chert fragments from beds up to 3 cm thick.	Mount Hare property area. 10 to 30% black lichen.	2021_09_09
RM1330	444136	7385275	695	moderate W	2	20	dark greyish brown	scree	3 to 7	Surface: 95 to 99% moderately blocky to moderately fissile, fragments up to 9 cm across (most <3 cm across), black, light grey weathering, very hard (siliceous), shale (siliceous shale / cherty shale ?). 1 to 5% black, black weathering chert fragments from beds up to 3 cm thick.	Mount Hare property area. 60 to 80% black lichen coverage. About 5 m from crest of knob.	2021_09_09

Sample	East	North	Elev (m)	Slope	LAV (%)	Depth (cm)	Sample Colour	Type	Fines (%)	Scree Description	Notes	Date
RM1331	444160	7385286	695	gentle E	30	20	dark (brownish) grey	scree	30 to 50	Surface: 95 to 99% moderately blocky to weakly fissile, fragments up to 7 cm across (most <3 cm across), black, light grey weathering, very hard (siliceous), no dilute HCl reaction, shale (siliceous shale). 1 to 5% black, black weathering chert from beds up t0 4 cm thick.	Mount Hare property area. West side of saddle.	2021_09_09
RM1332	444179	7385299	692	very gentle W	98	25	dark grey to black	soil	95 to 98 (silty)	Surface: Dark grey to black, medium to dark grey weathering, moderately hard, weakly to moderately fissile, fragments up to 4 cm across, no dilute HCl reaction, shale.	Mount Hare property area. 0.25 to 0.5% small roots.	2021_09_09
RM1333	444201	7385315	691	very gentle W	99	25	black	soil	85 to 95 (clayey silt)	Surface: Moderately fissile, fragments up to 5 cm across (most <3 cm across), dark grey to black, medium grey weathering, no dilute HCl reaction, shale.	Mount Hare property area. In saddle. <1% small roots.	2021_09_09
RM1334	444225	7385327	695	gentle W	100	25	dark grey to black	soil	70 to 90 (silty)	Pit: 10 to 30% fragments.	Mount Hare property area. 10 cm Ah. 1 to 2% small roots.	2021_09_09
RM1335	444244	7385341	702	gentle W	100	30	dark grey	soil / scree	40 to 60 (silty)	Pit: 40 to 60% fragments.	Mount Hare property area. 15 cm Ah.	2021_09_09
RM1336	444264	7385354	709	very gentle W	60	20	dark grey	scree	10 to 20 (silty)	Surface: 80 to 90% moderately fissile fragments up to 8 cm across (most <4 cm across), dark grey to dark (brownish) grey, moderately soft, weathers light to medium grey, no dilute HCl reaction, shale. 10 to 20% medium to dark grey, medium grey weathering, blocky, very strong reaction to dilute HCl, limestone fragments up to 20 cm across. Some surfaces display laminae to thin (~1 cm) bedding	Mount Hare property area. On west side of knob.	2021_09_09

Sample	East	North	Elev (m)	Slope	LAV (%)	Depth (cm)	Sample Colour	Type	Fines (%)	Scree Description	Notes	Date
RM1337	444290	7385365	716	gentle E	50	20	dark grey	scree	5 to 10 (silty)	Surface: 95 to 97% fragments up to 10 cm across (most <5 cm across), moderately fissile, medium to dark grey, light to medium grey weathering, moderately soft, no dilute HCl reaction, shale. 3 to 5% limestone fragments up to 20 cm across, light to medium grey, medium grey weathering, very blocky, very strong pervasive reaction to dilute HCl.	Mount Hare property area. Just east of top of minor ridge. 1 to 5% black lichen coverage.	2021_09_09
RM1338	444316	7385371	712	gentle E	50	30	dark grey to black	scree / soil	50 to 70 (silty)	Surface: 98 to 99% weakly blocky to moderately fissile, fragments up to 6 cm across (most <3 cm across), dark grey, medium grey weathering, hard, no dilute HCl reaction, shale. 1 to 2% limestone, fragments up to 10 cm across, blocky, very strong pervasive reaction to dilute HCl. One piece noted to contain ~5% black shale clasts up to 2 cm across and 3 mm thick.	Mount Hare property area. 0 to 1% black lichen coverage.	2021_09_09
RM1339	444340	7385373	706	moderate E	10	30	dark grey	scree	3 to 7	Surface: 98 to 99% dark grey, moderately hard to moderately soft, weakly to moderately fissile, light to medium grey weathering, fragments up to 5 cm across (most <3 cm across). 1 to 2% thinly bedded (up to 2 cm thick beds), blocky, limestone fragments up to 8 cm across, very strong pervasive reaction to dilute HCl,	Mount Hare property area. 2 to 10% black lichen coverage.	2021_09_09
RM1340	444368	7385378	694	moderate E	80	35	black	scree	20 to 30 (silty)	Surface: 98 to 99% fragments up to 5 cm across (most <2 cm across), dark grey, light to medium grey weathering, moderately soft, moderately blocky to weakly fissile, no dilute HCl reaction, shale. 1 to 2% limestone fragments up to 8 cm across, blocky, very strong pervasive reaction to dilute HCl.	Mount Hare property area. Near eastern limit of abundant surface scree.	2021_09_09

Sample	East	North	Elev (m)	Slope	LAV (%)	Depth (cm)	Sample Colour	Type	Fines (%)	Scree Description	Notes	Date
RM1341	444394	7385385	689	gentle E	100	35	dark grey to black	soil / scree	40 to 60 (silty)	Pit: 40 to 60% fragments.	Mount Hare property area. 10 cm Ah.	2021_09_09
RM1342	444424	7385383	684	gentle E	100	35	dark grey to black	soil / scree	20 to 40 (silty)	Pit: 60 to 80% fragments.	Mount Hare property area. 15 cm Ah.	2021_09_09
RM1343	442734	7390885	760	moderate W	100	40	dark grey	soil	85 to 95 (silty)	Pit: 5 to 15% fragments, mainly fissile, up to 3 cm across.	Mount Hare property area. 15 cm Ah. Spruce nearby. 1 to 2% small roots.	2021_09_10
RM1344	442756	7390898	769	moderate W	100	40	dark grey	soil	85 to 95 (silty)	Pit: 5 to 15% fragments.	Mount Hare property area. 15 cm Ah. Small spruce nearby. 0.5 to 1% small roots.	2021_09_10
RM1345	442774	7390917	775	moderate W	100	35	dark grey	soil	90 to 95 (silty)	Pit: 5 to 10% fragments.	Mount Hare property area. 15 cm Ah. Few small spruce nearby. 0.5 to 1% small roots.	2021_09_10
RM1346	442800	7390924	778	moderate W	99	20	medium to dark grey	scree / soil	5 to 15	Surface: Fragments up to 12 cm across (most <5 cm), weakly to moderately fissile, moderately hard, medium grey weathering. Apx 5 to 10% of the fragments have a moderately strong spotty reaction to dilute HCl. Shale and calcareous shale.	Mount Hare property area.	2021_09_10

Sample	East	North	Elev (m)	Slope	LAV (%)	Depth (cm)	Sample Colour	Type	Fines (%)	Scree Description	Notes	Date
RM1347	442822	7390933	784	moderate to steep west	70	25	medium grey	scree / (soil)	2 to 5	Surface: Mainly dark grey, dark grey weathering, weakly to moderately fissile, no dilute HCl reaction, moderately hard, shale fragments up to 15 cm across (most <5 cm across). 1 to 5% medium to dark grey, medium grey to medium orangey brown weathering (Fe-oxide), blocky to weakly fissile fragments. Some pieces have an Fe-oxide rind up to 8 mm thick. 1 to 5% light grey medium grey weathering, moderately fissile, moderately hard, weak to moderate spotty and fracture controlled reaction to HCl, calcareous shale, fragments up to 8 cm across.	Mount Hare property area. 1 to 2% small roots.	2021_09_10
RM1348	442849	7390933	802	gentle W	70	20	medium brown	scree / soil	20 to 40 (silty)	Surface: 95 to 98% fragments up to 8 cm across (most <5 cm across), dark grey, dark grey weathering, moderately fissile, moderately hard, no dilute HCl reaction, non-calcareous shale. 2 to 5% fragments up to 20 cm across, moderately to strongly fissile, platy, light to medium grey, weathers light grey to medium orange brown (Fe oxide), moderately hard, calcareous shale fragments up to 8 cm across (most <5 cm across). Very weak to weak spotty and fracture controlled reaction to dilute HCl.	Mount Hare property area.	2021_09_10
RM1349	441746	7411741	653	very gentle W	99	30	medium brown	soil	50 to 70 (silty)	Surface: Weakly to moderately fissile fragments up to 6 cm across (most <3 cm across), dark grey, medium grey weathering, moderately soft, no dilute HCl reaction, shale.	Sheep Creek property area.	2021_09_17

Sample	East	North	Elev (m)	Slope	LAV (%)	Depth (cm)	Sample Colour	Type	Fines (%)	Scree Description	Notes	Date
RM1350	441771	7411746	651	gentle W	99	20	medium brown	scree / (soil)	1 to 3	Surface: 98 to 99% shale fragments up to 10 cm across (most <5 cm across), moderately fissile - 2 types: A. Dark (brownish) grey, medium grey weathering, moderately hard to moderately soft, no dilute HCl reaction. B. Very dark grey to black, medium grey weathering, hard, no dilute HCl reaction. 1 to 2% black, black weathering chert up to 2 cm across, blocky.	Sheep Creek property area.	2021_09_17
RM1351	441793	7411760	654	gentle W	99	20	medium brown	scree / (soil)	1 to 3	Surface: Moderately fissile fragments up to 7 cm across (most <4 cm across), black, light to medium grey weathering, very hard (siliceous), no dilute HCl reaction, shale. 1 to 2% black, black weathering, blocky chert, up to 3 cm thick (original bedding thickness).	Sheep Creek property area. 10 cm Ah.	2021_09_17
RM1352	441823	7411756	657	gentle W	100	25	black	soil	85 to 95 (clayey silt)	Pit: 5 to 15% fragments.	Sheep Creek property area. 5 cm Ah.	2021_09_17
RM1353	441846	7411770	665	gentle W	100	30	dark grey	soil	80 to 90 (silty)	Pit: 10 to 20% fragments.	Sheep Creek property area. 5 cm Ah.	2021_09_17
RM1354	441872	7411772	668	gentle W	100	30	dark grey	soil	80 to 90 (silty)	Pit: 10 to 20% fragments.	Sheep Creek property area. 5 cm Ah. 1 to 2% small roots.	2021_09_17
RM1355	441899	7411783	674	gentle W	100	35	dark grey	soil	85 to 95 (clayey silt)	Pit: 5 to 15% fragments.	Sheep Creek property area. 20 cm Ah. 1 to 2% small roots.	2021_09_17
RM1356	441923	7411792	674	gentle W	100	35	dark grey	soil	75 to 85 (silty)	Pit: 15 to 25% fragments.	Sheep Creek property area. 10 cm Ah.	2021_09_17
RM1357	441948	7411793	680	gentle W	100	45	dark grey	soil	75 to 85	Pit: 15 to 25% fragments.	Sheep Creek property area. 20 cm Ah.	2021_09_17

Sample	East	North	Elev (m)	Slope	LAV (%)	Depth (cm)	Sample Colour	Type	Fines (%)	Scree Description	Notes	Date
RM1358	441972	7411803	681	gentle W	100	40	medium greyish brown	soil	70 to 80 (silty)	Pit: 20 to 30% fragments.	Sheep Creek property area. 5 cm Ah.	2021_09_17
RM1359	441998	7411819	688	gentle W	100	30	medium brown	soil	50 to 70 (silty)	Pit: 30 to 50% fragments.	Sheep Creek property area. 10 cm Ah.	2021_09_17
RM1360	442017	7411831	691	gentle W	100	30	medium greyish brown	soil	50 to 70 (silty)	Pit: 30 to 50% fragments.	Sheep Creek property area. 10 cm Ah.	2021_09_17
RM1361	442046	7411850	694	gentle W	100	35	medium to dark grey	soil	75 to 90 (clayey silt)	Pit: 10 to 25% fragments.	Sheep Creek property area. 15 cm Ah.	2021_09_17

Appendix 4

Laboratory Methods

SRC Geoanalytical Laboratories and Bureau Veritas

The (i) soil and scree samples and (ii) silt samples discussed collected in 2021 were shipped via Purolator to TSL Laboratories Inc. in Saskatoon, Saskatchewan near the end of September, 2001. Later that year TSL Laboratories Inc. was acquired by SRC Geoanalytical Laboratories of Saskatoon. Sample preparation was performed at TSL Laboratories Inc. / SRC Geoanalytical Laboratories. The samples were dried and sieved to <80 mesh (<180 microns). The sample preparation methodology was similar to that used for the 2020 samples (Prior, 2021).

The geochemical analyses of the <80 mesh sample fractions were subcontracted by SRC to Bureau Veritas with work performed at their laboratory at 9050 Shaughnessy St, Vancouver, BC V6P 6E5. The prepared samples were shipped by SRC via Purolator. Analytical results were received in February, 2022.

The prepared sample material underwent Bureau Veritas method code MA200 analysis. A 0.25 g split is heated in nitric acid (HNO3), perchloric acid (HClO4) and hydrofluoric acid (HF) to fuming and taken to dryness. The residue is dissolved in HCl. This digestion method is commonly referred to as 'near total' because hydrofluoric acid has the ability to dissolves silicate minerals. The resulting solution was analyzed for 46 elements by inductively coupled plasma mass spectrometry (ICP-MS). The multi-acid extraction may only partly liberate some elements including some Cr and Ba minerals and oxides of Al, Fe, Hf, Mn, Sn, Ta, Zr and REEs depending on sample mineralogy. Volatilization during fuming may result in some loss of volatile elements, such as As, S, Se and Sb.

Certified reference materials (standards) were inserted into the sample batches by Bureau Veritas. In addition, several samples were analyzed twice (duplicate pairs). The data obtained on these materials were reviewed by the author and the no significant analytical issues were detected.

Laboratory geochemical results for the soil and scree samples are presented in Appendix 2.

Analytical Quality Assurance (Bureau Veritas)

Certified reference materials (standards) were inserted into the sample batches by Bureau Veritas. In addition, several samples were analyzed twice (duplicate pairs). The data obtained on these materials were reviewed by the author and the no significant analytical issues were detected.

MSALABS

Geochemical analyses of rock samples collected in 2021 were performed at MSALABS of Langley, British Columbia. The method descriptions outlined below were provided by MSALABS.

Rock Sample Preparation (Method Code PRP-910)

The sample is dried, crushed to 70% passing 2 mm, and then passed through a riffle splitter to obtain a homogenized, representative split of 250 g. This sub-sample is then pulverized with a ring and puck (chrome steel) until 85% is less than 75 microns in size. An aliquot for analysis is taken from this material.

Multi-Element Determination using a Lithium Borate Fusion and ICP-OES Finish: Method Codes WRA-310 and WRA-V

A 0.15 g pulverised subsample is decomposed using lithium borate fusion. During fusion, material is heated in a muffle furnace at 1000° C with lithium borate flux. The fused sample is then cooled and dissolved in dilute nitric acid. The resulting solution is analyzed by inductively coupled plasma-optical emission spectroscopy and the quantified concentrations of the following elements, reported as oxides except for V, is reported (each with a lower detection limit of 0.01%):

SiO2, TiO2, Al2O3, Fe2O3, MnO, MgO, CaO, Na2O, K2O, P2O5, Cr2O3, BaO, SrO, V

Loss on ignition (LOI) at 1000° C and the “Total” (sum of oxides and LOI) are also reported.

Loss on Ignition: Method Code LOI-1000

1 g of pulverised subsample is weighed into a crucible, placed in an oven or furnace at 1000° C for one hour, cooled and then weighed again. The loss on ignition is calculated from the difference in weight.

Determination of Total Carbon and Sulphur: Method Code SPM-512

A pulverised subsample of 0.3 g is weighed into a ceramic crucible and analyzed for total carbon and sulphur using a LECO analyzer. Iron and tungsten accelerators are added to the sample and a stream of oxygen is passed over the sample in the induction furnace. As the sample is heated, carbon dioxide and sulfur dioxide released from the sample are measured by an IR detection system and the total contents of carbon and sulphur are determined. The analytical range is 0.01 to 50% for carbon and 0.01 to 20% for sulphur.

Multi-Element Determination Using an Aqua Regia Digestion and ICP-AES/MS Finish (39 Elements): Method Code IMS-127

The pulverised subsample is weighed (0.5 g) and digested under heat with a hydrochloric acid and nitric acid mixture in a 3:1 ratio (aqua regia). Upon completion of the digestion step, the sample is made up to volume with deionized water. This sample solution is then analyzed by inductively coupled plasma-atomic emission spectroscopy and inductively coupled plasma mass spectrometry. The values for Al, B, Ba, Ca, Cr, Fe, K, Mg, Mn, Na, P, S, Ti and Zn are reported based on ICP-AES data. The remaining elements are typically reported based on ICP-MS data but this may vary depending upon concentration ranges. Note that aqua regia digestion may provide only partial recovery for some elements, including (but not limited to): Al, Ba, Ca, Cr, Hf, K, La, Mg, Na, Nb, P, Sc, Sr, Ta, Ti, Tl, W and Zr.

Analytical Quality Assurance (MSALABS)

Certified reference materials (standards) and blanks were inserted into the sample batches by MSALABS. In addition, several samples were analyzed twice (duplicate pairs). The data obtained on these materials were reviewed by the author and the no significant analytical issues were detected.

Appendix 5

Rock Sample Geochemical Data

MSALABS
Unit 1, 20120 102nd Avenue
Langley, BC V1M 4B4
Phone: +1-604-888-0875

To: **Glen Prior**
793 Birch Avenue
Sherwood Park, Alberta, T8A 1X2
Canada

TEST REPORT:	YVR2111008

Project Name:	RM
Job Received Date:	2021-10-05
Job Report Date:	2021-12-17
Report Version:	Final
Total Samples:	29

COMMENTS:

WRA-3xx / xx = V

Test results reported relate to the tested samples only on an "as received" basis. Unless otherwise stated above, sufficient sample was received for the methods requested and all samples were received in acceptable condition. Analytical results in unsigned reports marked "provisional" are subject to change, pending final QC review and approval. The customer has not provided any information than can affect the validity of the test results. Please refer to MSALABS' Schedule of Services and Fees for our complete Terms and Conditions. Preliminary results are applicable when a portion of samples in a job is 100% completed and reported or 1 of a number of methods on the same job have been completed 100%. Results cannot change, but additional results or results for additional methods can be added

SAMPLE PREPARATION	
METHOD CODE	DESCRIPTION
PRP-910	Dry, crush 1kg to 2mm, split 250g & pulverize to 85% -75µm

ANALYTICAL METHODS	
METHOD CODE	DESCRIPTION
IMS-127	0.5g true aqua regia, ICP-MS finish (trace)
WRA-311	WRA-310 + C&S
WRA-3xx	WRA-310 individual element, xx denotes element code

STORAGE AND DISPOSAL	
METHOD CODE	DESCRIPTION
DIS-100	Dispose or return handling of reject /per sample
DIS-200	Dispose or return handling of pulp /per sample

Signature:

Yvette Hsi, BSc.
Laboratory Manager
MSALABS

MSALABS
Unit 1, 20120 102nd Avenue
Langley, BC V1M 4B4
Phone: +1-604-888-0875

To: **Glen Prior**
793 Birch Avenue
Sherwood Park, Alberta, T8A 1X2
Canada

TEST REPORT: YVR2111008

Project Name: RM
Job Received Date: 2021-10-05
Job Report Date: 2021-12-17
Report Version: Final
Total Samples: 29

Sample ID	Sample Type	PWE-100 Rec. Wt. kg 0.01	Method Analyte Units LOR	SPM-512 TC % 0.01	SPM-512 TS % 0.01	WRA-310 Al2O3 % 0.01	WRA-310 BaO % 0.01	WRA-310 CaO % 0.01	WRA-310 Cr2O3 % 0.01	WRA-310 Fe2O3 % 0.01	WRA-310 K2O % 0.01	WRA-310 MgO % 0.01
Granite Blank	QC-P-BK	--		0.12	0.02	13.05	0.08	2.30	0.02	2.84	1.85	0.84
Granite Blank	QC-P-BK	--		0.12	0.02	13.34	0.09	2.36	0.02	2.88	1.90	0.85
RM1401	Rock	0.39		10.20	1.41	4.05	0.91	13.24	0.01	1.80	1.03	1.48
RM1402	Rock	0.33		9.61	1.42	3.31	0.62	13.48	0.01	1.43	0.83	1.60
RM1403	Rock	0.37		7.58	1.44	3.79	0.87	11.01	0.01	1.36	0.94	2.00
RM1404	Rock	0.33		10.80	1.26	5.03	0.57	8.97	0.02	1.66	1.28	2.89
RM1405	Rock	0.45		8.24	1.93	5.35	2.11	10.25	0.04	1.85	1.43	2.86
RM1406	Rock	0.42		7.99	1.88	5.11	1.10	5.13	0.02	1.84	1.21	1.74
RM1407	Rock	0.30		6.99	2.41	6.54	0.84	5.71	0.02	2.34	1.58	2.65
RM1408	Rock	0.34		6.59	1.92	5.69	1.73	4.55	0.03	1.85	1.41	2.47
RM1409	Rock	0.43		7.25	0.75	3.61	0.40	0.50	0.03	1.02	0.83	0.20
RM1410	Rock	0.46		3.91	2.61	4.61	0.65	2.55	0.02	4.02	1.16	0.34
RM1411	Rock	0.30		6.01	0.99	4.76	0.40	2.04	0.03	1.73	1.16	0.49
RM1412	Rock	0.29		5.39	0.52	4.08	0.33	0.90	0.02	1.59	0.98	0.33
RM1413	Rock	0.31		5.47	0.58	2.30	0.17	3.04	0.02	0.92	0.54	0.34
RM1414	Rock	0.45		5.44	0.64	1.77	0.14	7.02	0.02	0.67	0.41	0.27
RM1415	Rock	0.52		5.39	0.83	1.96	0.13	2.94	0.03	0.85	0.45	0.26
RM1416	Rock	0.42		4.53	0.98	3.55	0.26	0.93	0.02	1.83	0.80	0.26
RM1417	Rock	0.39		2.90	0.27	2.97	0.20	0.06	0.01	0.31	0.69	0.19
RM1417PD	QC-PD	--		2.77	0.26	2.86	0.19	0.06	0.02	0.35	0.67	0.18
RM1418	Rock	0.55		2.60	0.28	3.02	0.21	0.04	0.02	0.46	0.70	0.18
RM1419	Rock	0.57		4.23	0.38	3.22	0.22	0.03	0.02	0.34	0.71	0.20
RM1420	Rock	0.73		2.35	0.25	4.76	0.32	0.15	0.01	0.77	1.05	0.29
RM1421	Rock	0.35		2.42	1.55	11.82	1.18	4.23	0.02	4.19	2.81	2.60
RM1422	Rock	0.59		2.32	1.33	10.99	1.18	3.19	0.02	3.41	2.64	2.27

***Please refer to the cover page for comments regarding this test report. ***

MSALABS
Unit 1, 20120 102nd Avenue
Langley, BC V1M 4B4
Phone: +1-604-888-0875

To: **Glen Prior**
793 Birch Avenue
Sherwood Park, Alberta, T8A 1X2
Canada

TEST REPORT: YVR2111008

Project Name: RM
Job Received Date: 2021-10-05
Job Report Date: 2021-12-17
Report Version: Final
Total Samples: 29

Sample ID	Sample Type	PWE-100 Rec. Wt. kg 0.01	Method Analyte Units LOR	SPM-512 TC % 0.01	SPM-512 TS % 0.01	WRA-310 Al2O3 % 0.01	WRA-310 BaO % 0.01	WRA-310 CaO % 0.01	WRA-310 Cr2O3 % 0.01	WRA-310 Fe2O3 % 0.01	WRA-310 K2O % 0.01	WRA-310 MgO % 0.01
RM1423	Rock	0.52		1.95	2.30	12.59	2.02	4.00	0.02	4.47	3.16	2.60
RM1424	Rock	0.35		2.62	1.93	12.93	1.78	4.16	0.02	4.17	3.25	2.79
RM1425	Rock	0.32		2.39	1.84	11.52	1.30	4.41	0.02	4.09	2.79	2.88
RM1426	Rock	0.47		3.15	1.37	11.39	1.68	4.56	0.02	3.64	2.89	3.06
RM1427	Rock	0.38		2.29	2.19	12.92	1.97	4.52	0.03	4.50	3.27	2.74
RM1428	Rock	0.36		2.65	2.15	10.66	2.15	6.12	0.02	3.83	2.77	3.78
RM1429	Rock	0.57		1.88	3.29	11.42	2.78	2.83	0.03	5.12	2.92	1.79
DUP RM1415												
DUP RM1406												
DUP RM1428				2.64	2.13							
STD BLANK						<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
STD BLANK												
STD BLANK												
STD BLANK				<0.01	<0.01							
STD OREAS 20a						15.20	0.12	3.66	0.01	5.42	4.01	2.38
STD CaCO3												
STD SRM 694												
STD OREAS 601												
STD OREAS 601				0.32	1.13							

***Please refer to the cover page for comments regarding this test report. ***

MSALABS
Unit 1, 20120 102nd Avenue
Langley, BC V1M 4B4
Phone: +1-604-888-0875

To: **Glen Prior**
793 Birch Avenue
Sherwood Park, Alberta, T8A 1X2
Canada

TEST REPORT: YVR2111008

Project Name: RM
Job Received Date: 2021-10-05
Job Report Date: 2021-12-17
Report Version: Final
Total Samples: 29

	WRA-310	WRA-310	WRA-310	WRA-310	WRA-310	WRA-310	WRA-310	WRA-310	WRA-3V	IMS-127	IMS-127	IMS-127
	MnO	Na2O	P2O5	SiO2	SrO	TiO2	LOI	Total	V	Ag	Al	As
	%	%	%	%	%	%	%	%	%	ppm	%	ppm
Sample ID	0.01	0.01	0.01	0.01	0.01	0.01	0.01		0.01	0.05	0.01	0.2
Granite Blank	0.08	4.11	0.08	73.86	0.02	0.34	1.52	100.99	<0.01	0.09	0.97	3.2
Granite Blank	0.08	4.18	0.08	73.07	0.02	0.34	1.67	100.86	<0.01	0.09	1.02	2.9
RM1401	0.01	0.12	0.15	53.50	0.09	0.21	21.31	97.91	0.13	0.54	0.55	34.8
RM1402	<0.01	0.07	0.08	54.16	0.09	0.17	21.47	97.30	0.13	0.55	0.51	30.9
RM1403	0.01	0.12	0.11	57.92	0.07	0.20	17.96	96.38	0.11	0.52	0.48	19.2
RM1404	0.01	0.17	0.04	54.91	0.04	0.26	22.23	98.08	0.16	0.82	0.63	42.5
RM1405	0.01	0.09	1.39	56.41	0.11	0.26	17.98	100.15	0.03	1.49	0.50	27.1
RM1406	0.01	0.15	0.08	68.23	0.04	0.25	16.08	100.98	0.21	2.68	0.63	47.7
RM1407	0.01	0.22	0.44	61.26	0.05	0.33	18.33	100.33	0.23	2.86	0.84	64.1
RM1408	0.02	0.20	0.44	65.30	0.05	0.27	15.86	99.87	0.11	2.39	0.51	31.5
RM1409	<0.01	0.19	0.13	82.67	0.01	0.15	11.20	100.93	0.17	1.98	0.51	31.1
RM1410	<0.01	0.28	0.07	70.89	0.04	0.22	14.72	99.57	0.13	2.74	0.50	54.6
RM1411	<0.01	0.19	0.08	77.16	0.02	0.23	12.48	100.76	0.28	2.95	0.74	58.6
RM1412	<0.01	0.18	0.35	82.95	0.02	0.19	9.35	101.27	0.26	1.48	0.69	37.3
RM1413	<0.01	0.05	0.20	82.70	0.04	0.10	10.08	100.50	0.27	1.61	0.60	41.3
RM1414	<0.01	0.04	0.08	79.12	0.06	0.08	11.48	101.17	0.21	1.69	0.40	30.9
RM1415	<0.01	0.04	0.08	84.02	0.02	0.09	9.83	100.69	0.19	1.96	0.42	40.9
RM1416	<0.01	0.21	0.04	83.49	<0.01	0.19	9.54	101.12	0.14	0.47	0.40	22.5
RM1417	<0.01	0.04	<0.01	90.41	<0.01	0.14	5.54	100.56	0.09	0.23	0.28	3.0
RM1417PD	<0.01	0.04	<0.01	91.46	<0.01	0.13	4.83	100.79	0.08	0.22	0.36	2.8
RM1418	<0.01	0.05	<0.01	92.36	<0.01	0.14	4.65	101.82	0.06	0.21	0.27	3.4
RM1419	<0.01	0.04	0.01	89.30	<0.01	0.15	6.73	100.98	0.10	0.38	0.33	5.7
RM1420	<0.01	0.04	0.03	88.70	<0.01	0.21	4.63	100.96	0.11	0.45	0.61	7.2
RM1421	0.02	0.82	0.04	63.14	0.02	0.66	9.78	101.31	0.02	0.49	0.76	7.7
RM1422	0.01	0.84	0.07	65.28	0.02	0.62	7.92	98.46	0.02	0.69	0.71	5.6

***Please refer to the cover page for comments regarding this test report. ***

MSALABS
Unit 1, 20120 102nd Avenue
Langley, BC V1M 4B4
Phone: +1-604-888-0875

To: **Glen Prior**
793 Birch Avenue
Sherwood Park, Alberta, T8A 1X2
Canada

TEST REPORT: YVR2111008

Project Name: RM
Job Received Date: 2021-10-05
Job Report Date: 2021-12-17
Report Version: Final
Total Samples: 29

Sample ID	WRA-310 MnO % 0.01	WRA-310 Na2O % 0.01	WRA-310 P2O5 % 0.01	WRA-310 SiO2 % 0.01	WRA-310 SrO % 0.01	WRA-310 TiO2 % 0.01	WRA-310 LOI % 0.01	WRA-310 Total %	WRA-3V V % 0.01	IMS-127 Ag ppm 0.05	IMS-127 Al % 0.01	IMS-127 As ppm 0.2
RM1423	0.02	0.68	0.03	58.99	0.02	0.69	8.49	97.79	0.02	0.49	0.74	6.6
RM1424	0.02	0.63	0.13	57.84	0.02	0.71	9.58	98.04	0.02	0.50	0.73	8.1
RM1425	0.02	0.80	0.04	61.69	0.02	0.61	9.88	100.07	0.02	0.39	0.78	6.6
RM1426	0.02	0.70	0.22	57.90	0.04	0.63	10.92	97.67	0.02	0.39	0.81	9.2
RM1427	0.02	0.66	0.14	57.56	0.03	0.69	10.75	99.79	0.02	0.44	0.89	8.8
RM1428	0.03	0.76	0.03	57.77	0.04	0.58	9.98	98.52	0.02	0.35	0.65	8.0
RM1429	0.02	0.56	0.14	61.73	0.02	0.63	9.70	99.69	0.03	0.95	0.75	11.6
DUP RM1415									0.19			
DUP RM1406										2.49	0.64	46.5
DUP RM1428												
STD BLANK	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01						
STD BLANK									<0.01			
STD BLANK										<0.05	<0.01	<0.2
STD BLANK												
STD OREAS 20a	0.07	2.60	0.22	66.37	0.04	0.85	0.66	101.62				
STD CaCO3							42.20					
STD SRM 694									0.17			
STD OREAS 601										49.40	0.87	303.8
STD OREAS 601												

***Please refer to the cover page for comments regarding this test report. ***

MSALABS
Unit 1, 20120 102nd Avenue
Langley, BC V1M 4B4
Phone: +1-604-888-0875

To: **Glen Prior**
793 Birch Avenue
Sherwood Park, Alberta, T8A 1X2
Canada

TEST REPORT: YVR2111008

Project Name: RM
Job Received Date: 2021-10-05
Job Report Date: 2021-12-17
Report Version: Final
Total Samples: 29

Sample ID	IMS-127 Au ppm 0.001	IMS-127 B ppm 10	IMS-127 Ba ppm 10	IMS-127 Bi ppm 0.05	IMS-127 Ca % 0.01	IMS-127 Cd ppm 0.05	IMS-127 Co ppm 0.1	IMS-127 Cr ppm 1	IMS-127 Cu ppm 0.2	IMS-127 Fe % 0.01	IMS-127 Ga ppm 0.1	IMS-127 Hg ppm 0.01
Granite Blank	<0.001	<10	68	<0.05	0.81	0.11	3.1	87	3.8	1.73	3.8	0.07
Granite Blank	0.001	<10	71	<0.05	0.84	0.15	3.4	84	3.6	1.77	4.2	0.01
RM1401	0.004	16	158	0.11	8.64	9.96	3.6	61	73.3	1.17	4.3	0.28
RM1402	<0.001	21	114	0.09	8.94	9.81	3.0	67	74.5	0.98	3.6	0.26
RM1403	<0.001	17	155	0.09	7.32	6.28	3.9	57	43.6	0.89	3.3	0.17
RM1404	0.001	27	369	0.12	5.97	17.88	5.0	87	101.3	1.06	5.1	0.34
RM1405	<0.001	22	108	0.13	6.47	2.81	4.6	186	102.5	1.15	4.4	0.27
RM1406	0.004	19	109	0.13	3.40	26.78	4.8	103	130.8	1.16	5.7	0.57
RM1407	0.001	28	82	0.17	3.63	26.60	8.0	75	201.3	1.45	5.9	0.58
RM1408	<0.001	20	100	0.12	3.03	8.07	5.2	142	89.8	1.20	3.1	0.20
RM1409	<0.001	15	1239	0.08	0.35	1.20	1.0	143	73.0	0.65	3.1	0.28
RM1410	<0.001	10	78	0.20	1.81	3.10	24.7	88	50.3	2.72	2.5	0.28
RM1411	<0.001	19	602	0.12	1.38	31.55	4.3	129	164.2	1.09	5.3	0.59
RM1412	<0.001	23	879	0.09	0.62	13.33	2.9	98	78.9	1.03	4.1	0.33
RM1413	<0.001	16	654	0.06	2.10	27.21	1.7	131	75.1	0.61	4.2	0.52
RM1414	<0.001	<10	561	<0.05	4.78	40.19	1.5	111	86.2	0.45	3.1	0.41
RM1415	<0.001	<10	413	0.05	2.03	44.14	2.1	140	192.4	0.54	4.8	0.48
RM1416	<0.001	<10	532	0.08	0.67	0.45	1.5	69	36.3	1.22	2.2	0.12
RM1417	<0.001	<10	981	0.07	0.04	0.08	0.2	60	2.8	0.16	1.3	0.09
RM1417PD	<0.001	<10	1058	0.06	0.03	0.06	0.3	95	3.0	0.19	1.7	0.09
RM1418	<0.001	<10	1017	0.05	0.02	0.07	0.2	70	3.5	0.26	1.1	0.06
RM1419	<0.001	<10	1042	0.07	0.01	0.12	0.2	60	9.8	0.18	1.5	0.10
RM1420	<0.001	13	1794	0.07	0.09	0.18	0.2	57	7.2	0.45	2.5	0.07
RM1421	<0.001	20	206	0.16	2.89	0.48	11.5	62	49.9	2.65	3.4	0.21
RM1422	<0.001	17	170	0.15	2.25	0.39	10.4	58	55.3	2.22	3.3	0.17

***Please refer to the cover page for comments regarding this test report. ***

MSALABS
Unit 1, 20120 102nd Avenue
Langley, BC V1M 4B4
Phone: +1-604-888-0875

To: **Glen Prior**
793 Birch Avenue
Sherwood Park, Alberta, T8A 1X2
Canada

TEST REPORT: YVR2111008

Project Name: RM
Job Received Date: 2021-10-05
Job Report Date: 2021-12-17
Report Version: Final
Total Samples: 29

Sample ID	IMS-127 Au ppm 0.001	IMS-127 B ppm 10	IMS-127 Ba ppm 10	IMS-127 Bi ppm 0.05	IMS-127 Ca % 0.01	IMS-127 Cd ppm 0.05	IMS-127 Co ppm 0.1	IMS-127 Cr ppm 1	IMS-127 Cu ppm 0.2	IMS-127 Fe % 0.01	IMS-127 Ga ppm 0.1	IMS-127 Hg ppm 0.01
RM1423	<0.001	16	77	0.19	2.75	0.38	11.3	58	44.5	2.89	3.3	0.19
RM1424	<0.001	19	136	0.18	2.82	0.60	13.5	53	49.5	2.65	3.3	0.22
RM1425	0.003	19	109	0.16	2.95	1.04	10.7	61	47.4	2.58	3.4	0.21
RM1426	<0.001	19	113	0.15	3.14	0.23	13.3	62	43.7	2.39	3.8	0.23
RM1427	<0.001	24	73	0.18	2.95	0.50	12.7	70	47.2	2.73	4.8	0.38
RM1428	<0.001	13	72	0.15	4.14	0.34	9.8	63	33.5	2.45	3.2	0.13
RM1429	<0.001	14	45	0.25	1.92	1.77	13.8	78	64.9	3.32	4.1	0.20
DUP RM1415 DUP RM1406 DUP RM1428 STD BLANK STD BLANK	<0.001	23	133	0.11	3.14	25.37	4.6	101	119.6	1.06	5.6	0.52
STD BLANK STD BLANK STD OREAS 20a STD CaCO3 STD SRM 694	<0.001	<10	<10	<0.05	<0.01	<0.05	<0.1	<1	<0.2	<0.01	<0.1	<0.01
STD OREAS 601 STD OREAS 601	0.791	<10	227	20.96	1.08	7.81	4.9	41	1038.4	2.21	5.1	0.33

***Please refer to the cover page for comments regarding this test report. ***

MSALABS
Unit 1, 20120 102nd Avenue
Langley, BC V1M 4B4
Phone: +1-604-888-0875

To: **Glen Prior**
793 Birch Avenue
Sherwood Park, Alberta, T8A 1X2
Canada

TEST REPORT: YVR2111008

Project Name: RM
Job Received Date: 2021-10-05
Job Report Date: 2021-12-17
Report Version: Final
Total Samples: 29

	IMS-127 K	IMS-127 La	IMS-127 Mg	IMS-127 Mn	IMS-127 Mo	IMS-127 Na	IMS-127 Ni	IMS-127 P	IMS-127 Pb	IMS-127 Re	IMS-127 S	IMS-127 Sb
	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm
Sample ID	0.01	0.5	0.01	5	0.05	0.01	0.1	10	0.2	0.005	0.01	0.05
Granite Blank	0.10	6.9	0.45	470	1.77	0.10	3.5	382	8.6	<0.005	0.03	0.42
Granite Blank	0.11	7.0	0.46	484	1.74	0.11	3.6	392	9.2	<0.005	0.03	0.53
RM1401	0.18	20.5	0.79	75	75.79	0.02	161.5	681	9.2	0.097	0.99	9.60
RM1402	0.16	17.9	0.88	59	79.35	0.02	157.8	370	8.1	0.110	1.08	10.59
RM1403	0.16	14.6	1.13	73	78.39	0.01	185.6	552	7.4	0.070	1.13	8.57
RM1404	0.21	19.3	1.68	82	96.39	0.02	256.4	227	10.1	0.095	0.83	16.89
RM1405	0.18	20.8	1.56	100	9.01	0.02	161.4	5880	6.4	0.048	1.37	17.72
RM1406	0.19	8.3	0.92	70	63.56	0.01	185.5	351	9.3	0.083	1.40	33.89
RM1407	0.26	7.3	1.42	92	76.18	0.02	207.1	1843	14.8	0.089	1.89	57.51
RM1408	0.17	8.6	1.39	116	15.92	0.02	140.0	1980	7.1	0.077	1.41	27.03
RM1409	0.15	11.1	0.07	5	26.34	<0.01	61.2	566	6.5	0.109	0.38	10.15
RM1410	0.19	10.6	0.15	64	25.66	0.02	108.6	283	19.2	0.036	2.32	16.91
RM1411	0.22	10.4	0.21	51	55.85	<0.01	170.6	346	11.9	0.123	0.68	63.39
RM1412	0.21	10.5	0.14	45	76.17	<0.01	166.0	1524	8.0	0.105	0.24	23.75
RM1413	0.18	10.9	0.17	28	74.91	<0.01	169.4	879	8.1	0.179	0.32	25.79
RM1414	0.12	9.2	0.12	31	46.72	<0.01	134.8	222	6.3	0.123	0.43	45.08
RM1415	0.13	6.6	0.10	26	34.75	<0.01	193.8	289	6.1	0.183	0.56	97.35
RM1416	0.16	7.6	0.07	10	63.51	<0.01	103.3	160	6.4	0.107	0.72	8.26
RM1417	0.12	2.3	0.03	<5	28.64	<0.01	11.4	30	6.5	0.047	0.15	4.86
RM1417PD	0.15	2.5	0.03	5	28.15	<0.01	13.3	29	6.2	0.044	0.14	4.47
RM1418	0.12	1.2	0.02	<5	27.12	<0.01	8.7	17	4.9	0.039	0.17	3.92
RM1419	0.13	1.0	0.03	<5	40.82	<0.01	14.3	70	4.7	0.049	0.19	5.55
RM1420	0.24	7.2	0.05	<5	34.34	<0.01	10.8	139	5.4	0.048	0.15	7.87
RM1421	0.36	9.9	1.23	123	3.00	0.02	62.5	144	8.3	0.005	1.51	0.92
RM1422	0.33	7.9	1.08	109	2.19	0.02	53.3	268	7.0	0.007	1.30	0.72

***Please refer to the cover page for comments regarding this test report. ***

MSALABS
Unit 1, 20120 102nd Avenue
Langley, BC V1M 4B4
Phone: +1-604-888-0875

To: **Glen Prior**
793 Birch Avenue
Sherwood Park, Alberta, T8A 1X2
Canada

TEST REPORT: YVR2111008

Project Name: RM
Job Received Date: 2021-10-05
Job Report Date: 2021-12-17
Report Version: Final
Total Samples: 29

Sample ID	IMS-127 K % 0.01	IMS-127 La ppm 0.5	IMS-127 Mg % 0.01	IMS-127 Mn ppm 5	IMS-127 Mo ppm 0.05	IMS-127 Na % 0.01	IMS-127 Ni ppm 0.1	IMS-127 P ppm 10	IMS-127 Pb ppm 0.2	IMS-127 Re ppm 0.005	IMS-127 S % 0.01	IMS-127 Sb ppm 0.05
RM1423	0.36	6.9	1.23	126	3.22	0.02	51.5	108	8.5	0.008	2.13	0.72
RM1424	0.35	9.3	1.31	132	4.22	0.01	72.7	554	8.4	0.010	1.77	0.96
RM1425	0.33	6.7	1.45	137	2.40	0.02	57.0	166	7.7	<0.005	1.77	0.81
RM1426	0.37	8.4	1.55	144	2.84	0.02	100.1	934	7.4	0.006	1.20	1.31
RM1427	0.39	11.1	1.27	127	4.87	0.02	78.5	533	8.2	0.011	2.09	0.88
RM1428	0.32	8.6	2.04	195	3.22	0.02	47.4	90	5.9	0.011	2.06	2.60
RM1429	0.31	8.4	0.82	108	5.36	0.02	89.3	575	9.2	0.008	3.00	4.70
DUP RM1415												
DUP RM1406	0.19	8.4	0.86	64	59.96	0.01	178.1	326	8.6	0.081	1.29	31.84
DUP RM1428												
STD BLANK												
STD BLANK												
STD BLANK	<0.01	<0.5	<0.01	<5	<0.05	<0.01	<0.1	<10	<0.2	<0.005	<0.01	<0.05
STD BLANK												
STD OREAS 20a												
STD CaCO3												
STD SRM 694												
STD OREAS 601	0.26	21.2	0.20	450	3.64	0.07	23.5	359	281.3	<0.005	1.04	20.41
STD OREAS 601												

***Please refer to the cover page for comments regarding this test report. ***

MSALABS
Unit 1, 20120 102nd Avenue
Langley, BC V1M 4B4
Phone: +1-604-888-0875

To: **Glen Prior**
793 Birch Avenue
Sherwood Park, Alberta, T8A 1X2
Canada

TEST REPORT: YVR2111008

Project Name: RM
Job Received Date: 2021-10-05
Job Report Date: 2021-12-17
Report Version: Final
Total Samples: 29

	IMS-127 Sc	IMS-127 Se	IMS-127 Sr	IMS-127 Te	IMS-127 Th	IMS-127 Tl	IMS-127 Tl	IMS-127 U	IMS-127 V	IMS-127 W	IMS-127 Y	IMS-127 Zn
	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm
Sample ID	0.1	0.2	0.5	0.05	0.2	0.005	0.05	0.05	1	0.05	0.5	2
Granite Blank	3.4	<0.2	27.9	<0.05	2.2	0.092	<0.05	0.50	22	0.35	9.7	32
Granite Blank	3.6	<0.2	32.1	<0.05	2.4	0.100	<0.05	0.50	24	0.37	9.7	35
RM1401	4.2	14.6	833.7	0.11	3.5	0.006	0.91	18.12	952	0.37	32.7	812
RM1402	3.3	89.9	938.3	0.09	2.2	0.006	0.95	19.38	907	0.33	25.4	825
RM1403	3.4	6.7	622.3	0.08	2.8	0.005	1.05	17.67	762	0.31	24.4	518
RM1404	4.6	9.2	375.6	0.12	3.7	0.008	1.00	20.75	1141	0.33	32.7	1624
RM1405	5.5	15.2	764.6	0.12	3.5	<0.005	0.32	11.09	137	0.21	54.4	671
RM1406	5.2	22.0	214.4	0.13	2.7	0.007	0.77	13.49	1341	0.34	25.2	1869
RM1407	6.3	25.9	331.0	0.16	3.1	0.009	1.28	12.83	1655	0.45	19.7	1920
RM1408	4.8	22.5	309.9	0.10	2.6	0.005	0.39	9.98	744	0.18	17.5	490
RM1409	3.8	23.9	84.4	0.10	1.9	0.008	0.20	14.91	1273	0.21	14.4	237
RM1410	2.9	22.1	199.2	0.26	1.8	0.006	2.00	6.13	900	0.31	14.3	308
RM1411	4.9	28.6	144.9	0.14	2.4	0.010	1.01	20.17	2147	0.29	20.7	2132
RM1412	5.3	22.7	137.4	0.13	2.3	0.011	1.51	21.94	2056	0.40	27.4	1148
RM1413	4.5	20.9	276.4	0.12	1.4	0.008	1.29	15.24	2379	0.35	24.8	1887
RM1414	3.5	37.6	477.6	0.08	0.9	0.005	0.77	10.25	1614	0.28	22.5	2105
RM1415	3.1	21.2	159.9	0.12	1.1	<0.005	1.32	10.10	1339	0.30	14.8	2751
RM1416	2.1	15.3	62.8	0.09	1.8	<0.005	1.34	8.49	613	0.26	4.6	189
RM1417	0.9	3.1	32.7	0.07	0.9	<0.005	0.65	1.59	222	0.19	3.2	7
RM1417PD	1.0	3.1	33.5	0.06	1.0	<0.005	0.54	1.61	276	0.24	3.4	6
RM1418	0.8	5.6	26.2	0.06	0.7	<0.005	0.63	0.95	141	0.20	1.3	6
RM1419	1.1	10.1	25.7	0.10	0.8	<0.005	0.84	2.28	258	0.21	2.0	7
RM1420	1.6	4.1	40.5	0.07	1.5	<0.005	0.71	2.73	350	0.21	1.8	9
RM1421	6.1	2.3	102.9	<0.05	5.6	<0.005	0.22	1.56	36	0.05	10.9	122
RM1422	5.6	3.1	98.8	<0.05	5.2	<0.005	0.19	1.39	36	<0.05	10.0	138

***Please refer to the cover page for comments regarding this test report. ***

MSALABS
Unit 1, 20120 102nd Avenue
Langley, BC V1M 4B4
Phone: +1-604-888-0875

To: **Glen Prior**
793 Birch Avenue
Sherwood Park, Alberta, T8A 1X2
Canada

TEST REPORT: YVR2111008

Project Name: RM
Job Received Date: 2021-10-05
Job Report Date: 2021-12-17
Report Version: Final
Total Samples: 29

Sample ID	IMS-127 Sc ppm 0.1	IMS-127 Se ppm 0.2	IMS-127 Sr ppm 0.5	IMS-127 Te ppm 0.05	IMS-127 Th ppm 0.2	IMS-127 Tl % 0.005	IMS-127 Tl ppm 0.05	IMS-127 U ppm 0.05	IMS-127 V ppm 1	IMS-127 W ppm 0.05	IMS-127 Y ppm 0.5	IMS-127 Zn ppm 2
RM1423	7.0	2.8	102.9	<0.05	5.8	<0.005	0.29	1.58	35	0.06	9.1	103
RM1424	7.0	2.3	132.4	<0.05	6.2	<0.005	0.27	2.01	34	0.08	11.7	145
RM1425	6.4	2.3	126.8	<0.05	5.1	<0.005	0.22	1.81	37	0.06	10.3	102
RM1426	5.8	2.2	186.4	<0.05	5.3	<0.005	0.22	2.03	51	0.06	13.5	165
RM1427	6.6	2.8	139.7	<0.05	5.7	<0.005	0.28	1.88	52	0.08	10.6	200
RM1428	6.0	3.0	263.8	<0.05	5.0	<0.005	0.33	1.68	46	0.07	9.9	134
RM1429	6.4	8.8	105.3	0.07	4.7	<0.005	0.36	3.67	63	0.12	17.7	313
DUP RM1415 DUP RM1406 DUP RM1428 STD BLANK STD BLANK	5.0	20.2	215.0	0.12	2.6	0.007	0.68	12.96	1332	0.31	24.5	1726
STD BLANK STD BLANK STD OREAS 20a STD CaCO3 STD SRM 694	<0.1	<0.2	<0.5	<0.05	<0.2	<0.005	<0.05	<0.05	<1	<0.05	<0.5	<2
STD OREAS 601 STD OREAS 601	1.8	12.3	34.5	14.96	6.3	0.010	0.76	2.07	10	0.98	6.2	1298

***Please refer to the cover page for comments regarding this test report. ***

Appendix 6

Stream Silt Sample Geochemical Data

Sample	Method:	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200
	Analyte:	Ag	Al	As	Au	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cu	Fe	Hf	In
	Unit:	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm
RM1601		1.6	3.42	9	<0.1	1136	1	0.1	2.54	8.8	38	5.4	56	122.5	1.46	1.7	<0.05
RM1602		0.8	3.11	5	<0.1	1605	1	0.1	1.99	2.7	44	5.9	81	81.6	1.43	1.6	<0.05
RM1603		1.7	2.66	4	<0.1	751	1	<0.1	2.68	19.4	30	3.6	45	155	1.22	1.4	<0.05
RM1604		1.4	3.08	7	<0.1	1447	1	<0.1	2.76	7.5	40	5.4	50	104.9	1.48	1.5	<0.05
RM1605		1.4	2.76	5	<0.1	850	1	<0.1	3	9.5	34	5.3	43	123.5	1.3	1.4	<0.05
RM1606		1.1	4.74	12	<0.1	4897	2	0.1	2.24	9.7	44	7.7	93	75.4	1.94	1.8	<0.05
STD OREAS45H		<0.1	7.8	16	<0.1	339	1	0.2	0.14	<0.1	24	90.3	653	774.4	19.74	3.3	0.1

Sample	Method:	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200
	Analyte:	K	La	Li	Mg	Mn	Mo	Na	Nb	Ni	P	Pb	Rb	Re	S	Sb	Sc
	Unit:	%	ppm	ppm	%	ppm	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm
RM1601		1.66	23.7	32.5	1.75	128	7.7	0.204	5.7	47.2	0.294	14.2	67	<0.005	<0.1	6.4	6
RM1602		1.52	28.2	22	0.74	153	3.6	0.18	14.5	38.2	0.181	9.6	56.1	0.006	0.1	1.9	7
RM1603		1.33	21.3	25.4	1.34	98	4.8	0.148	4.9	44.5	0.214	10.9	55.2	<0.005	0.2	4.2	6
RM1604		1.45	24.8	27.8	1.53	125	5.7	0.155	6.4	41.5	0.268	11.1	59	0.009	0.1	4.6	6
RM1605		1.3	22.1	24.6	1.23	202	4.9	0.149	5.7	46.5	0.236	11	52.2	0.006	0.2	4.2	6
RM1606		2.1	25.4	32	1.51	157	10.5	0.107	8.9	74.6	0.201	13.5	100.3	0.038	<0.1	8.1	8
STD OREAS45H		0.2	12.1	12.9	0.25	416	1.4	0.091	13.5	434.3	0.022	12.3	22.1	<0.005	<0.1	0.6	60

Sample	Method:	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200
	Analyte:	Se	Sn	Sr	Ta	Te	Th	Ti	Tl	U	V	W	Y	Zn	Zr
	Unit:	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
RM1601		3	0.8	90	0.4	<0.5	6.2	0.155	1	6.6	346	0.6	26.3	529	66.1
RM1602		3	0.8	57	0.6	<0.5	5.6	0.218	0.7	4.6	214	0.7	24.2	254	66.4
RM1603		6	0.6	77	0.3	<0.5	5	0.124	0.9	5.5	276	0.4	23.9	406	54.8
RM1604		4	0.6	79	0.3	<0.5	5.7	0.147	0.7	5.4	278	0.5	26.5	409	61.6
RM1605		5	0.6	79	0.3	<0.5	5.1	0.134	0.8	5.9	268	0.5	23.8	445	54.6
RM1606		4	1.4	120	0.5	<0.5	6.8	0.226	1.2	6.3	549	0.7	27.7	676	72.4
STD OREAS45H		2	1.9	29	0.9	<0.5	7	0.906	<0.5	1.6	279	0.8	9.8	39	122.6

Appendix 7

Soil and Scree Sample Geochemical Data

Sample	Method:	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200
	Analyte:	Ag	Al	As	Au	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cu	Fe	Hf	In
	Unit:	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm
RM1201		1	4.03	17	<0.1	719	1	0.2	0.14	1.4	36	1.7	80	30.6	1.64	1.6	<0.05
RM1202		1.3	4.08	16	<0.1	830	1	0.2	0.14	1.9	39	1.7	77	33.5	1.48	1.7	<0.05
RM1203		0.8	4.24	38	<0.1	1469	1	0.4	0.15	0.6	39	3.9	84	32.8	2.95	1.7	<0.05
RM1204		1	4.8	50	<0.1	166	1	0.3	0.21	1	47	6.5	93	48.9	3.9	2.2	0.07
RM1205		0.4	3.23	69	<0.1	57	2	0.2	0.1	2.2	28	1.8	105	88.9	3.22	1.7	0.06
RM1206		0.3	2.2	10	<0.1	120	2	0.2	0.04	3.1	28	0.5	29	12.1	0.86	1.2	<0.05
RM1207		0.2	3.55	13	<0.1	1834	2	0.1	0.13	5.5	31	4.5	45	34.3	1.56	1.3	<0.05
RM1208		0.8	4.02	31	<0.1	1201	2	0.1	0.14	1.9	32	1.9	61	53.7	1.05	1.5	<0.05
RM1209		3.6	2.7	75	<0.1	1499	2	0.2	1.78	66.1	27	10.9	99	144.3	1.63	1.1	<0.05
RM1210		9.9	4.5	146	<0.1	371	2	0.5	0.25	17.5	49	13.3	284	130.5	3.29	2.1	0.06
RM1211		4.6	4.15	40	<0.1	5268	2	0.2	0.42	16.5	42	4.7	150	107.1	1.83	1.6	<0.05
RM1212		1.1	3.5	28	<0.1	6681	2	0.2	1.25	17.4	37	3.9	114	100.1	2	1.4	<0.05
RM1213		0.6	2.67	12	<0.1	>10000	1	<0.1	13.45	5.8	22	6.1	63	37.1	1.55	1	<0.05
RM1214		2.2	6.46	10	<0.1	>10000	3	0.2	0.39	2.6	63	11.5	143	77.6	3.64	2.7	0.06
RM1215		1.3	6.34	10	<0.1	>10000	3	0.2	0.54	1.9	52	10.7	112	83.9	3.25	2.2	0.06
RM1216		0.7	5.03	6	<0.1	>10000	2	0.2	0.52	0.7	42	5.7	89	47.9	2.47	1.7	<0.05
RM1217		0.9	5.14	3	<0.1	>10000	2	0.2	0.79	1.3	42	2.8	87	62.9	1.55	1.6	<0.05
RM1218		2	6.52	11	<0.1	>10000	3	0.3	0.47	2.7	42	12.8	126	102.1	3.69	2.5	0.06
RM1219		1.2	6.08	10	<0.1	>10000	3	0.2	0.29	0.3	42	9.8	118	65.7	3.58	2.1	0.06
RM1220		1.3	5.97	11	<0.1	6287	2	0.3	0.19	0.3	45	12.4	100	56.6	4.26	2	0.06
RM1221		1.2	5.29	11	<0.1	>10000	2	0.3	0.12	0.5	48	13.6	134	75.8	3.89	2.3	0.05
RM1222		0.5	4.15	6	<0.1	2438	2	0.2	0.24	0.3	34	10.3	129	45.6	2.55	1.7	<0.05
RM1223		1.3	5.76	9	<0.1	2346	2	0.3	0.27	1.1	48	12.2	133	92.4	3.73	2.6	0.07
RM1224		1.2	4.64	8	<0.1	572	2	0.2	0.21	1.3	49	11.1	184	110	3.14	2.1	0.07
RM1225		1.7	5.26	13	<0.1	132	3	0.3	0.69	0.9	37	6.4	141	100.4	4.28	2.1	0.05
RM1226		0.6	2.92	13	<0.1	1475	<1	0.1	0.2	1.3	39	1.7	44	33.1	1	1.5	<0.05
RM1227		0.5	3.03	15	<0.1	1026	1	0.1	0.22	0.8	41	2.1	46	30.8	1.13	1.5	<0.05
RM1228		0.5	4.13	55	<0.1	455	1	0.3	0.08	0.6	46	3.1	65	24.6	2.17	1.9	<0.05
RM1229		0.9	2.85	15	<0.1	187	1	0.2	0.12	2.1	35	1.2	56	88.9	1.57	1.3	<0.05
RM1230		1	2.8	16	<0.1	651	1	0.2	0.06	0.6	29	1	60	58.2	1.04	1.2	0.06
RM1231		1.4	3.01	20	<0.1	771	1	0.2	0.04	0.9	26	1	88	61.3	1.12	1.3	0.09

Sample	Method:	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200
	Analyte:	Ag	Al	As	Au	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cu	Fe	Hf	In
	Unit:	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm
RM1232		1.2	2.35	21	<0.1	384	1	0.1	0.02	0.7	21	0.3	49	89.2	0.52	1	0.07
RM1233		2.5	3.05	30	<0.1	209	1	0.2	0.03	0.9	29	0.8	105	68.1	1.54	1.4	0.1
RM1234		1	2.95	58	<0.1	78	1	0.2	0.05	1.1	28	1.3	91	39.4	2.43	1.2	0.06
RM1235		0.2	2.64	29	<0.1	351	1	0.2	0.07	0.7	27	1.7	79	41.4	2.05	1	<0.05
RM1236		0.4	2.55	50	<0.1	181	1	0.2	0.07	0.8	30	1.8	113	36.8	2.04	1.1	<0.05
RM1237		0.2	1.97	19	<0.1	182	1	0.1	0.03	1	19	1.9	92	25.7	1.09	0.8	<0.05
RM1238		0.3	4.41	27	<0.1	264	2	0.1	0.22	4.7	42	2.6	55	41.6	1.8	1.7	<0.05
RM1239		0.3	4.24	25	<0.1	143	2	0.2	0.16	6.6	35	3.9	55	41.9	2.08	1.6	<0.05
RM1240		0.3	4.62	16	<0.1	1383	2	0.2	0.14	4.7	41	4.3	71	51.8	1.62	1.6	0.07
RM1241		1.6	6.14	9	<0.1	8676	2	0.2	0.59	1.2	56	11.2	90	52.4	3.6	2	0.05
RM1242		1.6	6.35	12	<0.1	>10000	2	0.3	0.57	1.3	57	13	113	71.3	4.49	2.2	0.06
RM1243		2.6	5.59	7	<0.1	8076	1	0.2	0.5	1.5	56	13.7	88	66.7	3.02	2.1	<0.05
RM1244		0.8	6.28	12	<0.1	>10000	2	0.3	0.25	0.6	52	21.4	107	74.7	5.17	2.3	0.06
RM1245		1.2	5.39	14	<0.1	8934	2	0.3	0.32	1	55	15.6	80	60.9	3.54	1.8	<0.05
RM1246		0.7	4.38	11	<0.1	4758	2	0.2	0.26	0.5	35	5.8	132	67.2	3.32	1.6	<0.05
RM1247		0.8	5.32	13	<0.1	377	3	0.2	0.79	0.7	49	14	127	89.7	4.11	1.9	<0.05
RM1248		0.4	5.69	8	<0.1	4395	2	0.2	0.13	0.2	30	9.3	99	42.7	4.07	2.2	0.05
RM1249		0.3	6.01	8	<0.1	2677	2	0.2	0.09	0.1	40	8	79	29.4	3.9	2.6	0.05
RM1250		<0.1	6.33	18	<0.1	4421	3	0.3	0.11	0.2	17	20.1	84	45.2	4.99	2.9	0.07
RM1251		1.1	2.81	12	<0.1	1067	1	0.2	0.07	0.7	29	0.7	40	29.8	0.54	1.3	<0.05
RM1252		1.3	2.8	10	<0.1	669	1	0.1	0.2	1.1	23	0.5	40	69.6	0.51	1	<0.05
RM1253		1.3	3.05	46	<0.1	230	1	0.2	0.05	1.5	26	2.1	109	46.7	2.11	1.2	<0.05
RM1254		0.8	3.62	38	<0.1	446	1	0.2	0.16	0.9	33	1.4	72	52.8	2.25	1.4	<0.05
RM1255		0.4	3.3	26	<0.1	223	1	0.2	0.07	0.4	31	1.7	62	45.6	2.26	1.5	<0.05
RM1256		0.8	2.85	25	<0.1	229	1	0.2	0.03	1	26	1.8	73	70	1.35	1	<0.05
RM1257		0.5	2.59	11	<0.1	635	1	0.1	0.12	0.6	27	1.3	50	132	0.69	1.1	<0.05
RM1258		0.7	2	28	<0.1	51	1	0.2	0.03	0.3	25	0.6	33	48.1	3.28	1.2	<0.05
RM1259		0.3	2.98	58	<0.1	502	1	0.1	0.03	0.4	27	1.2	108	26.5	1.92	0.9	<0.05
RM1260		0.2	3.11	36	<0.1	1334	1	0.2	0.08	0.4	33	2.7	104	23.3	2.28	1.4	<0.05
RM1261		0.5	3.73	21	<0.1	106	1	0.2	0.24	1.4	34	5.9	56	63.3	2.71	1.4	<0.05
RM1262		1	4	68	<0.1	98	2	0.2	0.12	1.2	30	4.3	114	90.7	3.94	1.4	0.08

Sample	Method:	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200
	Analyte:	Ag	Al	As	Au	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cu	Fe	Hf	In
	Unit:	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm
RM1263		1	2.92	37	<0.1	924	1	0.2	1.01	9.5	31	11	42	84.8	2.82	1.3	<0.05
RM1264		0.5	2.67	19	<0.1	1103	2	0.1	0.05	3	23	3.9	54	62.2	1.29	1.2	<0.05
RM1265		0.2	2.39	12	<0.1	557	2	0.1	0.01	0.8	13	0.5	26	17.7	0.57	0.9	<0.05
RM1266		0.2	1.96	8	<0.1	689	1	0.1	<0.01	0.3	14	0.3	36	16.2	0.66	0.8	<0.05
RM1267		0.2	1.56	3	<0.1	2056	1	0.1	0.02	5.3	27	0.5	26	14.8	0.16	0.6	<0.05
RM1268		0.1	2.1	10	<0.1	1555	1	0.1	<0.01	0.6	34	0.8	30	17.4	0.45	0.9	<0.05
RM1269		1.5	4.89	22	<0.1	4399	2	0.2	0.45	18	47	6.5	102	81.4	1.51	1.9	<0.05
RM1270		1.4	3.33	21	<0.1	3691	2	0.2	0.28	14.9	35	1.7	86	68.7	0.86	1.5	<0.05
RM1271		0.7	1.79	29	<0.1	1165	1	0.1	0.04	2.8	28	1.5	133	57.6	1.02	0.8	<0.05
RM1272		1.1	1.89	52	<0.1	1673	1	0.1	0.08	17.1	27	4.4	147	107.8	1.09	0.8	<0.05
RM1273		1.4	4.05	85	<0.1	1532	2	0.2	0.27	15.7	45	12.1	111	110.2	2.36	1.5	<0.05
RM1274		2.6	5.85	163	<0.1	2589	3	0.2	0.1	32.9	38	55.9	213	170.2	2.49	1.7	0.06
RM1275		1.6	3.94	60	<0.1	890	2	0.2	0.31	33.4	48	6.7	157	140.8	1.93	1.7	0.06
RM1276		1.8	6.18	8	<0.1	>10000	2	0.3	0.55	0.7	47	12.2	111	55.7	3.53	2.2	0.06
RM1277		1.3	5.99	7	<0.1	>10000	2	0.2	0.62	0.3	44	9.8	110	34.1	3.31	2.1	0.06
RM1278		1.9	5.32	6	<0.1	8505	2	0.2	1.03	0.5	54	8.5	90	68	2.83	1.8	0.05
RM1279		1.5	5.01	5	<0.1	>10000	2	0.2	1.23	0.4	44	8.5	94	44.6	2.71	1.7	<0.05
RM1280		1.6	4.75	5	<0.1	5253	2	0.2	1.42	0.5	50	8.7	77	64.9	2.86	1.5	<0.05
RM1281		1.2	5.76	4	<0.1	7178	2	0.2	0.95	0.3	54	8.4	80	48.8	3.13	1.9	0.05
RM1282		0.2	6.12	4	<0.1	6136	3	0.2	0.24	0.2	42	9.2	91	35.2	3.5	2.2	0.06
RM1283		0.3	6.11	6	<0.1	6492	2	0.2	0.31	0.2	49	11.7	98	45	3.65	2.1	0.06
RM1284		0.2	6.61	3	<0.1	6119	3	0.2	0.14	<0.1	41	12.1	79	28.2	3.61	2.3	0.06
RM1285		0.1	6.03	3	<0.1	5833	2	0.2	0.16	0.1	39	13.8	84	37.2	3.84	2.1	0.06
RM1286		0.4	2.83	54	<0.1	1122	1	0.2	0.05	0.4	30	1.6	95	28.2	1.9	1.1	<0.05
RM1287		0.2	2.86	38	<0.1	280	1	0.2	0.12	1.6	27	4.8	86	73.7	2.21	1.1	<0.05
RM1288		0.3	2.31	30	<0.1	94	1	0.1	0.05	0.3	27	1.3	86	76.7	1.64	1.2	0.05
RM1289		0.2	4.46	13	<0.1	1855	2	0.1	0.11	2.2	32	2.8	67	30.9	1.64	1.3	<0.05
RM1290		0.4	3.96	10	<0.1	1919	2	0.1	0.4	3.4	32	2.1	65	38.4	1.08	1.3	<0.05
RM1291		0.8	2.93	51	<0.1	1318	2	0.1	0.2	25.8	28	6.4	114	100.1	1.73	1	<0.05
RM1292		0.4	2.05	41	<0.1	1840	1	0.1	0.12	12.6	25	1.9	95	57.1	1.08	0.7	<0.05
RM1293		5.2	2.57	72	<0.1	1213	2	0.2	0.27	38.3	24	6.4	222	165.2	1.51	1	<0.05

Sample	Method:	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200
	Analyte:	Ag	Al	As	Au	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cu	Fe	Hf	In
	Unit:	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm
RM1294		4.2	4.66	62	<0.1	2380	2	0.3	0.47	26.6	42	9	144	116.9	2.61	1.7	<0.05
RM1295		1.4	3.87	20	<0.1	5062	2	0.2	0.95	7.7	40	6.7	114	76.9	2.57	1.5	<0.05
RM1296		0.8	4.64	7	<0.1	9028	2	0.1	0.67	1.6	43	5.3	88	42.6	3.01	1.5	<0.05
RM1297		0.7	5.85	10	<0.1	>10000	2	0.2	0.51	2.2	50	4.7	114	56.5	2.86	2	<0.05
RM1298		0.4	5.94	11	<0.1	>10000	2	0.2	0.31	0.3	44	3.9	113	30.4	3.12	2	<0.05
RM1299		1.2	4.68	8	<0.1	9892	2	0.2	1.33	3	46	6.1	97	90.8	2.32	1.6	<0.05
RM1300		0.6	4.86	8	<0.1	8500	2	0.2	0.79	0.6	39	10.2	87	24.7	3.2	1.6	<0.05
RM1301		0.6	4.1	6	<0.1	3572	1	0.2	0.99	0.9	38	7.7	73	33.9	2.26	1.4	<0.05
RM1302		0.9	4.85	8	<0.1	7220	2	0.2	0.91	0.3	39	7.7	98	48.9	2.58	1.7	<0.05
RM1303		0.9	5.11	7	<0.1	>10000	2	0.2	0.65	0.7	42	4.5	104	50.4	2.53	1.7	0.1
RM1304		1.1	5.84	7	<0.1	>10000	3	0.2	0.45	0.5	41	7.4	110	57.9	3.04	1.9	0.05
RM1305		0.8	4.58	5	<0.1	4370	2	0.2	1.13	0.5	39	4.1	91	56.8	2.06	1.6	<0.05
RM1306		1.4	3.59	13	<0.1	1383	2	0.2	1.69	1.9	39	6.2	102	54.8	2.03	1.5	<0.05
RM1307		2.3	4.93	22	<0.1	664	2	0.3	0.99	3.8	47	9.7	135	77.4	3.28	2	0.06
RM1308		0.3	4.83	10	<0.1	851	1	0.2	2.13	0.8	53	9.9	76	27.4	2.86	1.5	<0.05
RM1309		0.3	3.59	7	<0.1	668	1	0.1	4.74	0.6	46	7.5	62	20.7	2.17	1.1	<0.05
RM1310		0.5	5.87	4	<0.1	>10000	2	0.2	0.24	0.4	44	1.8	100	35.9	0.9	1.9	<0.05
RM1311		0.7	5.8	2	<0.1	>10000	2	0.2	0.34	0.5	45	1.4	106	34.1	0.82	1.9	<0.05
RM1312		0.5	4.56	2	<0.1	5436	2	<0.1	0.52	0.5	37	1.6	77	16.4	1.3	1.4	<0.05
RM1313		0.9	4.23	4	<0.1	2592	1	0.2	0.57	0.4	36	2.6	64	23.4	2.49	1.3	<0.05
RM1314		0.7	5.15	5	<0.1	7251	2	0.2	0.61	0.3	41	8.1	75	26.4	2.82	1.6	<0.05
RM1315		0.9	5.17	4	<0.1	6418	2	0.2	0.97	0.6	46	7.4	82	49.9	2.43	1.6	<0.05
RM1316		0.6	2.44	15	<0.1	74	<1	0.1	0.02	0.3	23	0.7	43	12.4	1.37	1.1	<0.05
RM1317		0.4	3	22	<0.1	321	1	0.1	0.05	0.3	32	1.3	46	15.1	1.3	1.2	<0.05
RM1318		0.8	3.44	34	<0.1	36	1	0.2	<0.01	0.2	31	0.6	51	21.5	3.15	1.3	<0.05
RM1319		1	4.54	15	<0.1	1623	1	0.2	0.23	0.9	44	2.5	69	40.1	2.06	1.7	<0.05
RM1320		0.8	3.76	17	<0.1	1326	1	0.2	0.21	1.1	41	2	67	38	1.96	1.6	<0.05
RM1321		1.5	3.14	7	<0.1	1078	1	0.2	0.11	0.7	32	0.9	63	51.6	1.21	1.3	<0.05
RM1322		0.9	3.11	2	<0.1	973	1	0.2	0.1	0.6	32	0.7	51	47.8	0.43	1.2	<0.05
RM1323		0.7	2.61	4	<0.1	806	1	0.1	0.07	1	30	0.5	41	38.7	0.44	1.1	<0.05
RM1324		0.8	3.95	28	<0.1	185	1	0.2	0.16	1.3	41	2.4	80	56.9	2.17	1.5	<0.05

Sample	Method:	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200
	Analyte:	Ag	Al	As	Au	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cu	Fe	Hf	In
	Unit:	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm
RM1325		0.9	3.6	26	<0.1	105	1	0.2	0.27	1.1	40	3.2	66	66.2	2.12	1.4	<0.05
RM1326		2	2.96	14	<0.1	95	1	0.1	0.05	1	30	0.6	69	74.1	1.17	1.4	<0.05
RM1327		0.2	1.86	7	<0.1	881	<1	<0.1	0.02	0.5	20	0.7	64	26.2	0.59	0.7	<0.05
RM1328		0.3	3.16	28	<0.1	822	1	0.2	0.13	0.4	41	2.8	98	51.3	2.23	1.5	<0.05
RM1329		0.2	2.08	20	<0.1	57	1	0.1	0.04	0.3	22	1.4	114	79.9	2.02	0.9	<0.05
RM1330		0.3	1.55	10	<0.1	144	<1	<0.1	0.03	0.3	18	1.6	129	98.8	1.12	0.7	<0.05
RM1331		0.2	3.65	25	<0.1	135	1	0.2	0.18	1.1	37	3.7	63	98.1	2.83	1.6	<0.05
RM1332		0.5	4.15	17	<0.1	1772	2	0.2	0.3	4.1	36	3.2	80	46.3	1.73	1.4	<0.05
RM1333		0.3	4.21	19	<0.1	1020	2	0.1	0.23	0.5	36	2.3	49	33	2.06	1.7	<0.05
RM1334		1.9	3.85	65	<0.1	509	2	0.2	0.66	21.7	35	9	121	115.4	2.6	1.5	<0.05
RM1335		3.9	4.49	63	<0.1	1531	2	0.2	0.8	32.3	53	9.6	115	100.9	2.5	1.5	<0.05
RM1336		4.5	4.5	58	<0.1	1208	2	0.2	3.24	57.5	53	11.3	106	126.9	2.57	1.7	<0.05
RM1337		8.6	4.1	156	<0.1	263	3	0.3	0.66	75.5	41	18	223	228.4	2.53	1.8	<0.05
RM1338		5	3.26	87	<0.1	208	2	0.2	0.82	31.3	49	10.8	268	162.7	2.04	1.4	<0.05
RM1339		4	2.9	101	<0.1	447	2	0.2	0.25	86.9	31	15.8	176	162.6	1.96	1.4	<0.05
RM1340		13.5	4.82	91	<0.1	1273	2	0.3	0.59	54.5	35	8.6	237	162.6	2.42	1.9	<0.05
RM1341		6.6	4.2	76	<0.1	645	2	0.2	0.87	41.4	44	9.5	174	148.3	2.26	1.9	<0.05
RM1342		5.8	4.03	63	<0.1	557	2	0.2	1.19	29.3	37	7.3	181	137.2	2.18	1.6	<0.05
RM1343		1	6.17	5	<0.1	>10000	2	0.2	0.7	0.5	46	6.3	103	36.9	2.73	2	0.05
RM1344		1.2	4.45	4	<0.1	3820	2	0.2	1.81	0.7	47	8.4	77	45.8	2.52	1.5	<0.05
RM1345		2.8	7.02	9	<0.1	>10000	3	0.2	0.65	1.2	53	12.4	148	81.5	3.45	2.5	0.06
RM1346		3	7.02	10	<0.1	9455	2	0.3	0.47	1	49	15.7	125	73	4.27	2.4	0.07
RM1347		1.3	5.75	7	<0.1	>10000	2	0.2	0.6	0.7	49	13	158	68	3.19	2.2	<0.05
RM1348		0.3	5.67	4	<0.1	5591	2	0.2	0.09	0.1	45	9.3	109	42.2	3.22	2.1	<0.05
RM1349		0.7	6.39	33	<0.1	2665	2	0.2	0.51	9.5	59	15	153	65	3.48	2.2	0.05
RM1350		0.9	2.59	38	<0.1	1329	1	0.1	0.15	10.7	28	4.8	158	77.7	1.57	0.9	<0.05
RM1351		0.4	3.93	31	<0.1	1924	2	0.2	0.19	1.1	42	4.5	104	45	2.29	1.5	<0.05
RM1352		3.6	5.45	21	<0.1	4534	2	0.2	0.61	25.4	49	6.6	146	91.7	2.09	2.1	<0.05
RM1353		1	5.59	9	<0.1	7999	2	0.2	0.54	0.7	56	10.1	104	44.6	2.43	1.9	<0.05
RM1354		0.8	5.35	4	<0.1	8321	2	0.2	0.55	0.9	54	4.9	123	42	1.93	2.2	<0.05
RM1355		1.2	5.75	3	<0.1	7446	2	0.2	0.82	1.2	55	7.1	99	57.5	2.08	2	<0.05

Sample	Method:	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200
	Analyte:	Ag	Al	As	Au	Ba	Be	Bi	Ca	Cd	Ce	Co	Cr	Cu	Fe	Hf	In
	Unit:	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm
RM1356		1.4	4.91	6	<0.1	9298	2	0.2	0.26	1.2	43	6.6	115	59.5	2.2	2	<0.05
RM1357		2.8	5.65	4	<0.1	5537	2	0.2	0.85	1.7	54	11.9	106	112.4	2.55	2	0.05
RM1358		0.8	6.33	10	<0.1	6880	2	0.3	0.49	0.5	53	15.6	111	55.9	3.69	2.2	0.05
RM1359		0.4	5.88	8	<0.1	5100	2	0.2	0.38	0.3	59	16.3	91	37.6	3.45	2.3	<0.05
RM1360		0.4	5.91	8	<0.1	4196	2	0.2	0.49	0.2	62	16	82	29.4	3.38	2.4	<0.05
RM1361		0.4	6.17	6	<0.1	4850	2	0.2	0.53	0.1	56	12	85	28.8	3.41	2.4	0.05
RM1229_Repeat		0.9	2.87	17	<0.1	252	1	0.2	0.12	2.1	37	1.1	55	87	1.51	1.4	<0.05
RM1243_Repeat		2.6	5.73	7	<0.1	7925	2	0.2	0.51	1.5	57	14.4	96	70.3	3.18	2.1	<0.05
RM1265_Repeat		0.2	2.35	11	<0.1	443	2	<0.1	0.01	0.8	14	0.6	26	17.7	0.56	0.9	<0.05
RM1301_Repeat		0.6	3.98	6	<0.1	3965	1	0.2	0.97	1	38	7.7	72	37	2.23	1.3	<0.05
RM1337_Repeat		9.5	4.21	163	<0.1	285	3	0.3	0.66	77.4	43	17	224	240.3	2.59	1.9	<0.05
RM1361_Repeat		0.4	6.28	6	<0.1	4919	2	0.2	0.53	0.1	59	12	87	29	3.41	2.3	0.05
STD OREAS25A-4A		<0.1	9.04	9	<0.1	144	<1	0.3	0.3	<0.1	44	7.3	121	30.1	6.55	3.5	0.09
STD OREAS25A-4A		<0.1	9.01	12	<0.1	148	<1	0.4	0.3	<0.1	49	7.9	119	31.9	6.66	4.1	0.08
STD OREAS45H		<0.1	7.8	16	<0.1	339	1	0.2	0.14	<0.1	24	90.3	653	774.4	19.74	3.3	0.1
STD OREAS45H		<0.1	8.22	16	<0.1	313	1	0.2	0.14	<0.1	23	91.5	693	804.3	20.17	3	0.1
STD OREAS45H		<0.1	8.12	15	<0.1	317	1	0.2	0.14	<0.1	23	88.4	671	820.1	20.06	2.9	0.09
STD OREAS45H		<0.1	7.89	20	<0.1	325	1	0.2	0.14	<0.1	24	88.6	656	760.6	20.11	3.3	0.09
STD OREAS45H		<0.1	8.46	17	<0.1	337	1	0.2	0.14	<0.1	25	100.6	695	830.8	21.81	3.3	0.1
STD OREAS501D		0.6	7.51	11	0.2	969	3	1.3	1.82	0.3	65	10	41	2740.7	3.4	1.9	0.08
STD OREAS501D		0.6	7.54	12	0.2	924	3	1.2	1.81	0.2	62	9	43	2722.5	3.33	1.7	0.08

Sample	Method:	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200
	Analyte:	K	La	Li	Mg	Mn	Mo	Na	Nb	Ni	P	Pb	Rb	Re	S	Sb	Sc
	Unit:	%	ppm	ppm	%	ppm	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm
RM1201		1.06	20.4	10	0.33	36	24.5	0.157	7.3	21	0.092	11.1	76.9	0.005	0.1	8.4	8
RM1202		1.1	22.5	9.9	0.32	36	35	0.207	7.5	28.8	0.111	12.9	78.1	0.008	<0.1	11	8
RM1203		1.03	22.7	16.8	0.37	109	51.6	0.307	8.7	30.4	0.053	15.8	68	<0.005	0.1	15.8	8
RM1204		1.45	27	26.9	0.54	239	84	0.382	10.8	43.3	0.08	19.3	84.5	<0.005	0.4	25.7	10
RM1205		1.09	13	11.7	0.27	73	115.4	0.105	7.3	39.4	0.085	14	66.2	0.017	0.7	12.6	9
RM1206		0.86	15.8	5	0.17	12	40.3	0.039	6.2	25	0.013	11.4	48.8	0.037	0.3	3.6	5
RM1207		1.13	19.8	5.1	0.28	22	37.9	0.103	5.3	131.4	0.017	8.6	68.5	0.035	<0.1	3.9	7
RM1208		1.39	19.9	8.2	0.3	22	38.2	0.158	6.5	73.6	0.029	9.1	78.4	0.029	<0.1	13.7	8
RM1209		0.83	20.7	7.1	0.33	139	57.7	0.113	3.5	298.5	0.052	15.8	50.9	0.021	<0.1	50.1	8
RM1210		1.42	30.9	13.4	0.26	75	79.2	0.218	6.7	267.1	0.082	37.3	85.8	0.016	0.1	106.4	11
RM1211		1.32	26.1	13.1	0.28	64	35.7	0.323	6	148	0.058	9.9	78.6	0.006	<0.1	24.2	9
RM1212		1.17	25.3	14.9	0.36	86	14.3	0.333	6	200.3	0.092	10.6	62	<0.005	<0.1	13.7	8
RM1213		0.99	13.4	8.4	6.97	616	21.4	0.212	4.5	77.5	0.051	6.8	50	0.016	<0.1	9	5
RM1214		2.69	35.6	16.3	0.34	193	8.8	0.642	13.2	81.9	0.097	14.8	127	<0.005	<0.1	5.1	13
RM1215		2.33	29	19.1	0.51	136	6.2	0.492	9.1	82.5	0.068	14.8	127.1	<0.005	<0.1	3.8	14
RM1216		1.83	23.5	16.8	0.51	68	4.1	0.415	6.9	35.1	0.065	16.2	98.6	<0.005	<0.1	2.1	9
RM1217		1.67	24.8	16.9	0.57	48	2.3	0.382	6.4	36.9	0.051	15.6	95.6	0.012	<0.1	1.8	10
RM1218		2.86	25.1	20.5	0.7	121	8.2	0.54	10.4	89.6	0.057	20.5	136.1	0.006	<0.1	5.6	14
RM1219		2.29	23.1	16	0.39	122	5.5	0.477	8	60.6	0.081	18.5	115.3	<0.005	<0.1	3.2	10
RM1220		1.91	23	27	0.61	219	4.2	0.381	8.1	49.6	0.081	22.1	113.2	<0.005	<0.1	1.9	11
RM1221		2.19	28.3	16.6	0.38	210	2.9	0.83	10.1	72.1	0.096	21.8	100.8	<0.005	<0.1	2.6	10
RM1222		1.94	18.8	30.7	0.48	317	2.8	0.289	6.9	38.2	0.124	20.4	91.2	<0.005	<0.1	1.9	7
RM1223		2.04	27.5	32.5	0.63	385	4	0.373	9.3	54.1	0.139	59.9	120.1	<0.005	0.1	3	12
RM1224		2.11	28.4	24	0.48	207	3.8	0.222	8.2	61.5	0.145	193.2	95.1	<0.005	<0.1	4.4	9
RM1225		2.46	15.5	29.9	0.53	111	3	0.41	9.4	40.8	0.743	16.3	105.5	0.007	0.5	2.1	12
RM1226		0.9	21.5	12.7	0.25	72	15.7	0.314	6.7	11.2	0.042	8.3	46.8	<0.005	<0.1	5.9	7
RM1227		0.97	22.8	13.1	0.27	87	18.4	0.388	6.9	12.5	0.039	8	47.8	<0.005	<0.1	6.6	7
RM1228		1.15	25.2	17.4	0.3	115	25	0.183	8.3	15.6	0.052	16.8	75.4	<0.005	0.1	10	8
RM1229		0.92	19.1	9.5	0.24	46	26.7	0.21	5.9	14.4	0.037	9	57.3	0.014	0.2	11.2	7
RM1230		0.9	16.5	7	0.22	30	37.1	0.111	5.5	14.8	0.031	9.4	55.9	0.01	0.1	10.1	6
RM1231		1.06	16.4	8.4	0.25	18	40	0.06	5.7	21.7	0.045	10.5	63.3	0.016	0.2	12.7	8

Sample	Method:	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200
	Analyte:	K	La	Li	Mg	Mn	Mo	Na	Nb	Ni	P	Pb	Rb	Re	S	Sb	Sc
	Unit:	%	ppm	ppm	%	ppm	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm
RM1232		0.85	12.3	7.6	0.17	7	16.6	0.029	4.7	15.1	0.019	7.2	49.2	0.043	0.2	8.9	7
RM1233		1.07	20.2	7.6	0.24	16	67.7	0.054	6.6	21.2	0.052	13.5	67.1	0.025	0.4	20.1	8
RM1234		0.98	15.8	9.7	0.24	44	78.4	0.092	5.6	20.8	0.08	11.1	61.3	0.02	0.6	18.5	7
RM1235		0.81	16.3	12.8	0.23	65	59.9	0.117	5.2	26.8	0.035	8.9	50.8	0.022	0.2	4.8	5
RM1236		0.75	18	19.1	0.21	74	70	0.083	5.5	33.6	0.076	10.8	48.5	0.018	0.3	11.2	6
RM1237		0.71	11.3	5.6	0.15	44	28.3	0.046	3.7	33.9	0.022	6.5	39.7	0.028	0.2	2.8	4
RM1238		1.51	24	6.2	0.33	24	38.6	0.153	6.5	89.7	0.031	9.6	85.6	0.031	0.3	4.2	9
RM1239		1.5	20.3	6.9	0.32	55	34.2	0.161	6.8	88.1	0.029	10.5	84.6	0.013	0.3	5.3	9
RM1240		1.45	25.2	7.2	0.34	42	35.1	0.152	6.9	73.3	0.022	9.3	87.7	0.011	<0.1	6.5	10
RM1241		1.62	31.8	26	0.59	432	5.1	0.634	8.3	51.6	0.098	20.1	92.6	<0.005	<0.1	2.6	12
RM1242		2.13	31.6	25.7	0.59	328	5.8	0.738	8.9	74.9	0.1	22.8	106.1	<0.005	<0.1	3.1	12
RM1243		1.47	31.8	27.4	0.43	665	3.8	0.577	8.6	65.2	0.104	16.4	82.3	<0.005	<0.1	2	11
RM1244		2.06	26.6	28.8	0.59	494	3.6	0.65	10.8	68.7	0.086	22	117	<0.005	<0.1	1.9	12
RM1245		1.65	30.1	19.5	0.45	602	7.2	0.502	7.3	48.6	0.129	20.8	85.8	<0.005	<0.1	1.7	10
RM1246		1.7	20.7	14.1	0.35	87	5.2	0.315	6.7	51.3	0.172	20.9	85	<0.005	<0.1	2.5	8
RM1247		2.17	28.5	19.3	0.46	402	4.3	0.445	8.3	58.1	0.432	22.5	102.5	<0.005	0.1	3.2	10
RM1248		2.39	14.5	53.7	0.97	171	1.6	0.134	8.7	34.7	0.073	14.3	100.6	<0.005	<0.1	1.3	10
RM1249		2.32	18.7	33.9	0.69	167	3	0.25	10.7	23.3	0.035	14.8	129.4	<0.005	<0.1	1.5	10
RM1250		3.66	6.5	28	1.01	585	4.1	0.078	10.3	55.3	0.039	32.3	114.6	<0.005	<0.1	0.9	11
RM1251		1.03	15.6	7.3	0.22	19	20.5	0.082	5.7	13.4	0.02	9.9	62.1	0.015	<0.1	14.4	6
RM1252		1	13.3	6.1	0.2	17	20.5	0.034	4.6	15.1	0.015	8.8	57.4	0.007	<0.1	9	7
RM1253		1.09	15.4	8.5	0.23	44	34.5	0.078	5.7	45.8	0.076	13.6	64.6	0.013	0.4	13.2	6
RM1254		1.11	18.7	12	0.31	48	42.6	0.221	6.3	16.3	0.082	11.8	67.7	0.006	0.2	15.8	9
RM1255		1.16	17.3	9.8	0.25	52	85.5	0.159	7.6	20.8	0.033	11.6	66.9	0.019	0.5	13.9	7
RM1256		1	15.5	24.8	0.21	50	34.9	0.061	4.8	20.6	0.024	10.1	57.1	0.012	0.3	11.1	6
RM1257		0.88	16.6	13.3	0.21	31	15.5	0.083	5.9	17.9	0.015	6.7	49.3	0.009	<0.1	9.4	8
RM1258		1.04	11.4	16.5	0.15	18	63.9	0.069	6.1	7.1	0.035	10.9	55.3	0.008	1.1	7.5	5
RM1259		0.75	14.3	37.2	0.17	38	67.2	0.056	4.5	42.7	0.048	9.2	44.6	0.023	0.2	13.5	6
RM1260		0.95	18.6	23.9	0.24	77	46.8	0.167	6.9	35.8	0.05	11.9	59.9	0.018	0.1	10.7	6
RM1261		1.19	17.4	13.9	0.39	191	54.1	0.373	6.7	31.4	0.044	10.5	65.6	<0.005	0.4	9.6	8
RM1262		1.11	18.2	18.8	0.31	113	89.5	0.171	5.8	57.7	0.083	12.5	68.2	0.017	0.5	83.5	9

Sample	Method:	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200
	Analyte:	K	La	Li	Mg	Mn	Mo	Na	Nb	Ni	P	Pb	Rb	Re	S	Sb	Sc
	Unit:	%	ppm	ppm	%	ppm	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm
RM1263		0.75	18.6	7.3	0.21	533	25.3	0.329	5.5	190.5	0.131	11.3	42.5	0.011	<0.1	33.9	8
RM1264		0.83	14.4	8.1	0.19	92	23.5	0.129	5.4	49.6	0.037	8.9	50.2	0.012	0.1	16.9	6
RM1265		0.94	7.3	5.1	0.15	15	41.3	0.03	4.5	9.5	0.018	6.4	50.6	0.015	0.1	3.4	5
RM1266		0.72	8	4.7	0.14	6	30.2	0.032	4	9.6	0.019	8.7	44.1	0.016	0.2	5	4
RM1267		0.53	16.5	3.4	0.1	11	11.6	0.03	3.9	12.5	0.005	5.4	29.5	0.024	<0.1	2.1	3
RM1268		0.69	19	8.5	0.13	22	36	0.032	4.7	11.7	0.009	7.1	39	0.067	<0.1	4.5	4
RM1269		1.63	30	13.4	0.46	125	33.6	0.21	8.4	152.9	0.042	12.4	99.2	0.011	0.1	15.1	10
RM1270		1.19	24.7	8.7	0.25	53	37.9	0.187	7.5	118	0.031	7.1	62.5	0.025	<0.1	16.4	7
RM1271		0.56	25.4	5.7	0.13	39	45.6	0.073	3.4	97.6	0.026	9.2	34.6	0.017	<0.1	27.9	4
RM1272		0.58	26.3	6.5	0.15	93	70.4	0.051	3	136.5	0.059	10.7	37.1	0.032	<0.1	42.3	6
RM1273		1.38	31.5	9.9	0.2	318	115.9	0.257	5.9	302.7	0.134	15.3	72.4	0.016	<0.1	48.3	9
RM1274		1.46	27	38.8	0.37	577	111	0.041	5	916.7	0.096	23.5	76.7	0.084	0.2	70	12
RM1275		1.55	37.3	9	0.24	88	68.5	0.147	7.9	197.3	0.139	15.1	71.3	0.028	<0.1	33.9	8
RM1276		2.26	26.1	24.4	0.66	312	4.7	0.554	9.3	55	0.093	21.2	124.2	<0.005	<0.1	2.4	12
RM1277		2.17	23.1	23.5	0.68	260	3.6	0.57	9.3	46.8	0.087	17.4	116.8	<0.005	<0.1	1.9	11
RM1278		1.89	29.6	18.7	0.61	275	2.5	0.434	7.4	48.6	0.121	15.7	102.4	<0.005	<0.1	1.6	12
RM1279		1.87	23.9	16.4	0.58	298	3.3	0.444	7	48.6	0.1	14	97.3	<0.005	<0.1	1.6	10
RM1280		1.61	28.1	18.2	0.64	439	2.6	0.376	6.4	50	0.124	14.9	91.4	<0.005	<0.1	1.3	11
RM1281		2.12	30.3	21.7	0.73	275	1.8	0.365	7.7	39.7	0.107	13.8	118.7	<0.005	<0.1	1	11
RM1282		2.87	20.9	26.5	0.91	217	1.6	0.422	9.2	37	0.112	12.5	133.9	<0.005	<0.1	1.1	10
RM1283		2.53	25.4	26.4	0.84	304	2	0.504	8.8	44.2	0.153	15.2	120.2	<0.005	<0.1	1.4	10
RM1284		3.09	19.2	25.8	1.09	543	1	0.383	9.5	34.5	0.037	12.2	144	<0.005	<0.1	0.7	10
RM1285		2.74	17.6	31.6	1.01	461	0.6	0.409	8.6	34.2	0.058	13.9	123	<0.005	<0.1	0.8	10
RM1286		0.79	19.4	8.8	0.21	46	35.2	0.116	5.7	42.2	0.037	9.8	50.5	0.026	0.2	18.1	5
RM1287		0.79	14.7	12	0.25	329	67.4	0.184	5.1	103.5	0.063	8.6	44.4	0.013	0.2	3.5	7
RM1288		0.81	15.6	11	0.19	62	64.2	0.069	6.1	26	0.057	11.4	41.7	0.029	0.4	9.7	10
RM1289		1.46	19.7	7.6	0.35	35	24.9	0.079	6.6	51.5	0.028	8.2	87.7	0.018	<0.1	6.8	8
RM1290		1.09	19.4	7.5	0.3	26	14.9	0.144	5.6	73.8	0.032	8.2	70.6	0.017	<0.1	5.7	7
RM1291		0.93	20.6	8.5	0.22	86	59.5	0.097	4.4	188.4	0.044	10.8	55.8	0.016	<0.1	28.2	6
RM1292		0.69	18.4	5.6	0.14	20	44.8	0.114	2.9	95.4	0.02	11.3	42.8	0.013	<0.1	27.7	4
RM1293		0.85	17	9	0.18	74	54.9	0.083	3.6	203.6	0.049	15.5	50	0.016	<0.1	48.8	7

Sample	Method:	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200
	Analyte:	K	La	Li	Mg	Mn	Mo	Na	Nb	Ni	P	Pb	Rb	Re	S	Sb	Sc
	Unit:	%	ppm	ppm	%	ppm	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm
RM1294		1.56	24.6	18	0.35	151	61.8	0.298	7.3	214.8	0.086	16.2	90.8	<0.005	<0.1	35.7	11
RM1295		1.29	23.2	13.9	0.32	228	16	0.335	7.1	69.8	0.126	11.1	73.6	0.005	<0.1	9.8	8
RM1296		1.51	22.5	14.4	0.34	148	7.1	0.417	7.3	38.1	0.111	11.2	85.9	<0.005	<0.1	3.3	9
RM1297		2.08	25.7	18.2	0.43	68	6.5	0.559	10	49	0.08	14.1	110.3	<0.005	<0.1	4.7	10
RM1298		2.08	23.6	18.9	0.42	93	5	0.546	9.9	21.2	0.039	14.6	108.3	<0.005	<0.1	2.7	8
RM1299		1.52	24.2	15.9	0.45	93	2.8	0.403	7.3	70.4	0.086	12.4	82.9	<0.005	<0.1	2.8	12
RM1300		1.55	22	19.8	0.53	413	6.3	0.443	7.2	27.4	0.094	14.9	86	<0.005	<0.1	2	8
RM1301		1.21	21.2	16	0.48	200	4.1	0.37	5.9	37.4	0.111	13.6	64.2	<0.005	<0.1	1.7	8
RM1302		1.69	21.9	20.6	0.62	282	5.9	0.347	7	48.9	0.107	16.4	83.9	<0.005	<0.1	2.5	10
RM1303		2.07	23.1	19.7	0.58	117	6.2	0.437	7.6	34.1	0.123	18.2	101.7	<0.005	<0.1	2.7	9
RM1304		2.35	23.4	19.1	0.58	93	3.6	0.577	7.9	46.3	0.076	16.6	112.6	<0.005	<0.1	2.1	10
RM1305		1.85	22.5	24.2	0.77	116	3.1	0.16	6.8	34.7	0.124	16	87.4	<0.005	<0.1	1.6	9
RM1306		1.29	22.2	19.3	0.64	133	8.9	0.259	6.1	54.2	0.161	16.6	55.7	<0.005	0.1	4.1	8
RM1307		1.56	25.9	26.5	0.77	245	23.2	0.502	8.3	116.8	0.103	21.1	71.7	<0.005	<0.1	8.6	12
RM1308		1.24	28.6	26.8	0.96	458	2.8	0.566	7.5	47.8	0.12	13.4	61.3	<0.005	<0.1	1.4	10
RM1309		0.88	25.4	19.3	0.6	449	2.4	0.42	6	34.9	0.154	10.3	42.4	<0.005	0.1	1.1	8
RM1310		2.29	23	17.9	0.46	36	2	0.56	10	14.5	0.056	13.4	118.9	<0.005	<0.1	1.9	8
RM1311		2.25	23.2	16	0.44	32	0.8	0.528	9.9	15	0.065	12	118.8	<0.005	<0.1	1.2	8
RM1312		1.55	20.8	11.9	0.38	34	1	0.388	7	13.9	0.069	7	88.3	<0.005	<0.1	0.7	6
RM1313		1.25	19.2	12.1	0.42	51	1.5	0.368	5.5	23.3	0.106	9.7	76.2	<0.005	<0.1	0.8	8
RM1314		1.6	23	15.6	0.53	297	3.6	0.455	6.5	27.6	0.081	11.9	92	<0.005	<0.1	1.2	8
RM1315		1.69	24.4	16.5	0.59	248	2.7	0.441	6.9	42.6	0.081	13.6	97.3	<0.005	<0.1	1.5	10
RM1316		0.85	12.6	5.6	0.13	26	25.3	0.063	3.7	12.1	0.014	10.6	48.4	0.026	0.3	8.1	4
RM1317		0.96	17.8	5.8	0.18	42	19.6	0.096	4.8	14.5	0.022	7.2	58	0.014	0.1	6.4	5
RM1318		1.33	16.6	4	0.18	12	76.3	0.047	5.1	12.6	0.044	19.5	81	0.031	0.8	14.2	5
RM1319		1.29	23.1	19.1	0.45	85	18.7	0.442	7.6	18.1	0.044	11.8	74.5	0.011	<0.1	8.8	9
RM1320		1.15	22.4	13.4	0.37	75	24.2	0.371	7.3	14.6	0.043	10.5	64.1	<0.005	<0.1	10.1	7
RM1321		0.89	18	8.9	0.24	35	20.9	0.184	5.7	12.3	0.061	11.8	58.2	0.007	<0.1	10.1	7
RM1322		0.99	18.3	7.7	0.22	29	16.2	0.196	6.1	9.8	0.028	10.3	63	<0.005	<0.1	7.6	6
RM1323		0.83	16.3	5.9	0.18	18	15.1	0.127	5.2	8.7	0.017	9.5	51.5	0.006	0.1	5.5	5
RM1324		1.16	22.7	12.5	0.34	90	54.3	0.26	7.6	20.8	0.075	11	67.8	<0.005	0.2	21.7	8

Sample	Method:	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200
	Analyte:	K	La	Li	Mg	Mn	Mo	Na	Nb	Ni	P	Pb	Rb	Re	S	Sb	Sc
	Unit:	%	ppm	ppm	%	ppm	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm
RM1325		1.2	24.2	12.8	0.39	131	52.5	0.413	7.4	21.5	0.068	10.2	63.1	<0.005	0.3	21.7	8
RM1326		1.09	21.1	6.7	0.21	21	33.5	0.083	6.4	14.2	0.046	9.1	58.1	0.01	0.3	17.9	6
RM1327		0.57	12.8	7.3	0.13	19	22.6	0.05	3.9	15	0.025	7	34.5	0.01	<0.1	5.5	3
RM1328		0.92	25.9	13.1	0.28	123	61.3	0.164	7.4	29.1	0.051	9.7	54	0.008	0.1	12.8	6
RM1329		0.75	13.5	9.4	0.16	61	94.9	0.077	4.6	22	0.048	7.9	40.7	0.015	0.4	4.2	5
RM1330		0.55	10.4	11.6	0.12	93	25.2	0.047	3.3	20.3	0.029	6.9	30.3	0.011	0.3	4.7	4
RM1331		1.22	20.6	16.5	0.34	128	56.9	0.29	8.6	35.7	0.039	11.5	68	0.006	0.3	7.7	7
RM1332		1.32	21.8	9.3	0.35	67	25.7	0.178	6.3	73.3	0.026	10.4	78.6	0.015	<0.1	7.7	8
RM1333		1.52	22.3	5.7	0.32	24	42	0.092	7.2	82.2	0.031	7.9	85.4	0.05	0.2	5.9	7
RM1334		1	23.8	11.6	0.31	121	82.3	0.152	5.6	344.3	0.087	10.2	59.3	0.016	<0.1	29.8	10
RM1335		0.93	30.9	19.5	0.35	183	69.6	0.257	5.8	294.3	0.071	16.3	57.2	0.009	<0.1	36.3	11
RM1336		1.26	33.2	19.3	1.34	449	55.5	0.386	6.4	268.2	0.089	16.4	65	0.01	<0.1	40.6	17
RM1337		1.29	34.6	10.7	0.34	125	114.9	0.076	5.8	504.4	0.074	22.5	79.5	0.022	<0.1	103.1	13
RM1338		1.17	31.3	23.7	0.49	164	56	0.076	4.7	193.8	0.094	17.7	63.2	0.045	0.2	37.8	9
RM1339		0.96	23.2	14.5	0.23	155	100.1	0.075	4.5	292	0.064	20	59.1	0.028	<0.1	55.4	9
RM1340		1.6	27.1	13.9	0.3	94	56.5	0.161	6.8	358.3	0.141	15.9	89.3	0.009	<0.1	48	11
RM1341		1.44	30	12	0.28	156	69.3	0.17	6.5	323.1	0.126	15.4	84.7	0.019	<0.1	40.4	11
RM1342		1.23	27.2	12.8	0.29	120	62.2	0.193	5.8	251.6	0.093	11.3	70.8	0.012	<0.1	35.8	12
RM1343		2.15	26.1	17.2	0.63	133	2.5	0.517	8.6	32.3	0.062	15.1	118.7	<0.005	<0.1	1.3	11
RM1344		1.36	25.8	15.9	0.55	296	3.1	0.299	5.7	45.3	0.127	12.5	86.8	<0.005	<0.1	1.2	9
RM1345		2.69	34.1	18.6	0.48	176	5.4	0.645	10.1	80.8	0.091	25.6	132.7	<0.005	<0.1	3.1	15
RM1346		2.41	25	28.2	0.67	313	6.2	0.555	10.1	84.9	0.09	20.1	131.1	<0.005	<0.1	1.7	16
RM1347		2.24	27.2	13.8	0.39	262	2.6	0.607	9.2	74.1	0.114	14.5	105.9	<0.005	<0.1	2.1	11
RM1348		2.57	24.1	19	0.64	145	2	0.48	8.6	38.1	0.071	14	129.1	<0.005	<0.1	1.3	10
RM1349		1.74	33.6	32.5	0.77	446	27.3	0.743	10.4	135.9	0.078	17.5	89.4	0.006	<0.1	19.7	12
RM1350		0.69	23.8	9.6	0.2	141	51.4	0.143	4.1	95.7	0.057	12.8	42.6	0.021	<0.1	39.7	6
RM1351		1.35	28.2	14.4	0.37	133	42.5	0.353	6.9	69.8	0.046	11.9	82.7	0.016	<0.1	20.6	7
RM1352		1.65	28.6	25.4	0.6	168	16	0.454	8.5	141.6	0.087	14	93	<0.005	<0.1	12.9	13
RM1353		1.6	32.5	21.9	0.55	289	9.6	0.545	8.7	59.6	0.074	14.6	88.3	<0.005	<0.1	3.5	10
RM1354		1.73	30.3	21.2	0.5	115	4.4	0.571	9.6	36.4	0.094	14.2	93.1	<0.005	<0.1	2.3	10
RM1355		1.81	32.4	21.3	0.6	121	1	0.672	9.2	42.7	0.076	14.1	92.6	<0.005	<0.1	1.6	12

Sample	Method:	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200
	Analyte:	K	La	Li	Mg	Mn	Mo	Na	Nb	Ni	P	Pb	Rb	Re	S	Sb	Sc
	Unit:	%	ppm	ppm	%	ppm	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm
RM1356		1.99	24.6	14.1	0.35	111	3.2	0.561	9.6	38.8	0.07	15.2	102.5	<0.005	<0.1	2.4	9
RM1357		1.62	29.5	26.1	0.65	264	2.4	0.528	7.9	84.3	0.126	18.1	91.3	<0.005	<0.1	1.8	15
RM1358		2.19	29.9	26.2	0.66	396	4.5	0.74	10.2	56	0.102	19.6	115.4	<0.005	<0.1	2.4	12
RM1359		1.98	30.2	24.9	0.66	485	3	0.687	10.1	38.6	0.062	17.1	109.9	<0.005	<0.1	1.1	10
RM1360		1.96	29.7	32.9	0.74	423	1.7	0.838	10.4	33.8	0.065	16.3	97.2	<0.005	<0.1	1.1	11
RM1361		2.11	28.1	33.6	0.87	339	1.5	0.774	10.9	34.3	0.064	13.3	109.4	<0.005	<0.1	0.9	11
RM1229_Repeat		0.92	20.7	9.3	0.24	45	25.7	0.212	5.9	13.9	0.036	9.1	56.8	0.015	0.2	11	7
RM1243_Repeat		1.55	31.9	28.3	0.45	695	4	0.604	8.9	69.3	0.111	16.5	87.4	<0.005	<0.1	2.2	12
RM1265_Repeat		0.95	7.5	5	0.15	15	41.2	0.03	4.5	9.6	0.018	6.7	50.1	0.016	0.1	3.4	5
RM1301_Repeat		1.2	21.5	15.7	0.46	194	4.1	0.367	5.8	37.3	0.112	13.8	65.6	<0.005	<0.1	1.7	8
RM1337_Repeat		1.31	37.1	10.8	0.35	122	118.3	0.076	6	521.7	0.076	24.8	81.3	0.021	<0.1	108.9	14
RM1361_Repeat		2.12	29.1	33.4	0.88	342	1.6	0.775	10.6	34.5	0.064	13.3	112.7	<0.005	<0.1	0.9	11
STD OREAS25A-4A		0.48	20.1	35.8	0.33	499	2.4	0.132	19.4	51.1	0.047	21.4	60.5	<0.005	<0.1	0.5	13
STD OREAS25A-4A		0.49	22.9	36.6	0.34	492	2.4	0.131	19.4	46.1	0.049	24.6	61.5	<0.005	<0.1	0.6	13
STD OREAS45H		0.2	12.1	12.9	0.25	416	1.4	0.091	13.5	434.3	0.022	12.3	22.1	<0.005	<0.1	0.6	60
STD OREAS45H		0.21	11.9	13.1	0.26	423	1.5	0.094	14.4	439.8	0.023	11	22.6	<0.005	<0.1	0.6	58
STD OREAS45H		0.21	12.1	13.1	0.25	421	1.5	0.093	13.8	428.7	0.022	10.7	22.6	<0.005	<0.1	0.6	57
STD OREAS45H		0.21	12.2	13.3	0.25	391	1.5	0.09	13.3	431.1	0.023	11.7	22.2	<0.005	<0.1	0.6	57
STD OREAS45H		0.22	13.7	13.4	0.27	418	1.6	0.097	14.5	459.5	0.023	12.4	24.6	<0.005	<0.1	0.7	62
STD OREAS501D		3.18	31.4	50.1	0.84	384	93.3	2.162	11.3	21.9	0.084	25.6	155.7	0.043	0.3	2.1	9
STD OREAS501D		3.16	28.9	52.8	0.82	377	96.7	2.133	11.2	22.2	0.089	23.7	155.9	0.041	0.3	2.2	9

Sample	Method:	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200
	Analyte:	Se	Sn	Sr	Ta	Te	Th	Ti	Tl	U	V	W	Y	Zn	Zr
	Unit:	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
RM1201		6	1.5	81	0.4	<0.5	5.2	0.235	5.3	8.7	745	0.8	11.7	77	65.5
RM1202		8	1.5	93	0.5	<0.5	5.7	0.234	5.7	8.8	707	0.9	15.5	74	66.6
RM1203		6	1.7	118	0.5	<0.5	5.9	0.293	4.7	6.7	644	1.2	11.2	124	69.5
RM1204		14	1.8	293	0.7	<0.5	7.6	0.352	9.6	9.8	936	1.5	16.3	134	90.7
RM1205		11	1.4	256	0.4	<0.5	4.4	0.211	9.8	17.5	971	1.3	20.1	115	70.4
RM1206		6	0.9	55	0.2	<0.5	3.2	0.154	4.9	8.9	288	0.6	9.7	25	56.6
RM1207		3	1.1	54	0.3	<0.5	4.3	0.187	2.4	7.6	774	0.6	11	251	51.5
RM1208		8	1.2	80	0.4	<0.5	4.8	0.215	5.9	10.2	1289	0.7	12.7	499	60.9
RM1209		24	0.8	165	0.2	<0.5	3.7	0.131	4.8	9.5	2976	0.8	41.6	5048	49.1
RM1210		36	1.6	174	0.4	0.6	6.2	0.224	9.7	20	2980	1.2	43.2	1906	90.2
RM1211		7	1.3	101	0.4	<0.5	6.3	0.199	3.8	10.1	1403	0.8	32.5	1200	63.8
RM1212		5	1.1	367	0.4	<0.5	5.4	0.17	2.1	10.2	871	0.6	30.9	692	59.2
RM1213		2	0.9	879	0.3	<0.5	3.7	0.133	0.8	3.7	640	0.5	13.1	384	46.4
RM1214		3	2.3	123	0.8	<0.5	10	0.356	1.1	6	428	1	33.1	356	105.3
RM1215		3	1.8	96	0.6	<0.5	9	0.319	1.1	4.8	257	0.9	28.8	261	83.4
RM1216		2	1.5	89	0.4	<0.5	6.6	0.244	0.7	4.1	220	0.8	19.7	122	66.5
RM1217		3	1.5	101	0.4	<0.5	6.8	0.223	0.7	4.2	216	0.7	21.1	115	63.4
RM1218		8	2.2	129	0.6	<0.5	8.4	0.357	1	4.7	387	1	22.3	361	98.1
RM1219		3	1.8	91	0.5	<0.5	8	0.288	0.9	4.4	288	0.8	19.9	207	79.4
RM1220		2	1.8	70	0.5	<0.5	7.7	0.29	0.8	3.8	178	0.9	18	157	78.8
RM1221		4	1.9	134	0.6	<0.5	8.2	0.329	0.7	4.9	246	1	21.5	250	85
RM1222		3	1.5	70	0.4	<0.5	5.9	0.227	0.5	3.9	188	0.8	14	151	61.9
RM1223		4	2	81	0.6	<0.5	9	0.314	0.9	5.7	213	1	19.9	360	98.7
RM1224		4	1.6	63	0.6	<0.5	7.9	0.261	0.7	5.9	231	0.9	30.9	447	80.2
RM1225		9	1.8	153	0.6	<0.5	5.8	0.299	0.7	5	219	0.8	31.7	140	83.7
RM1226		3	0.9	86	0.4	<0.5	5.6	0.248	2	9	302	0.7	10	34	56.8
RM1227		3	0.9	92	0.4	<0.5	5.8	0.255	1.9	8.9	318	0.8	9.8	40	56.7
RM1228		5	1.5	86	0.5	<0.5	6.7	0.318	5.5	6.6	450	1.1	9.4	63	70.9
RM1229		14	1	78	0.4	<0.5	5.3	0.214	5	11.8	479	0.8	9.3	25	53.3
RM1230		5	0.9	48	0.3	<0.5	4.4	0.195	5.5	10.2	668	0.7	7.4	31	46.9
RM1231		7	1.1	57	0.3	<0.5	4	0.184	6.4	12.2	777	0.7	8.2	33	50.3

Sample	Method:	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200
	Analyte:	Se	Sn	Sr	Ta	Te	Th	Ti	Tl	U	V	W	Y	Zn	Zr
	Unit:	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
RM1232		3	0.7	40	0.2	<0.5	2.8	0.141	4.2	14.6	628	0.5	6.1	14	39.8
RM1233		10	1.2	78	0.4	<0.5	4.3	0.186	9.6	16.2	797	1	10.6	28	60.2
RM1234		16	1.2	153	0.3	<0.5	4.2	0.179	8.7	16.4	1191	0.8	14.8	37	50.9
RM1235		5	1	78	0.3	<0.5	3.6	0.166	4.8	10.5	495	0.7	10.5	38	43.1
RM1236		7	1	198	0.3	<0.5	4	0.166	7.4	14.4	910	0.6	14.5	52	51.5
RM1237		4	0.7	51	0.2	<0.5	2.4	0.107	2.7	5.8	311	0.5	8.5	70	33.1
RM1238		4	1.5	160	0.4	<0.5	5.7	0.236	3.8	8.2	615	0.9	13.2	206	63.5
RM1239		5	1.5	120	0.4	<0.5	5.5	0.237	3.7	6.8	772	0.8	14.3	244	61.7
RM1240		5	1.5	81	0.5	<0.5	6.3	0.239	4.3	7.9	888	1	19.7	244	64.5
RM1241		2	1.6	118	0.6	<0.5	8	0.301	0.8	4	203	0.9	22.1	162	73.9
RM1242		3	1.8	132	0.6	<0.5	8.3	0.325	0.8	4	247	1	22.3	278	81.1
RM1243		3	1.5	117	0.6	<0.5	7.5	0.297	0.8	4.2	186	0.9	23.8	252	76.1
RM1244		3	2	97	0.7	<0.5	8.4	0.35	0.8	3.3	151	1.1	17	206	85.2
RM1245		3	1.6	81	0.5	<0.5	7.9	0.25	0.8	4.5	143	0.8	24	172	71.2
RM1246		8	1.5	70	0.4	<0.5	5.9	0.216	0.6	4.2	202	0.7	15	176	62.6
RM1247		5	1.7	116	0.5	<0.5	7.3	0.27	0.6	5.4	336	0.8	35.5	233	75.4
RM1248		1	2.1	46	0.5	<0.5	5.8	0.312	0.7	2.4	142	1	10.6	89	80.4
RM1249		<1	2.3	39	0.7	<0.5	6.6	0.394	0.9	2.6	151	1.4	8.6	76	94.4
RM1250		<1	2.4	27	0.7	<0.5	4.2	0.384	0.9	2.3	119	1.4	8.1	108	104.5
RM1251		6	1	47	0.3	<0.5	4	0.19	2.5	8	738	0.7	7.2	33	46.3
RM1252		7	0.7	70	0.3	<0.5	3.7	0.156	1.9	6.8	937	0.5	7.4	68	37.4
RM1253		10	1.1	77	0.3	<0.5	3.9	0.18	2.2	6.2	674	0.6	8.7	220	47.7
RM1254		9	1.3	73	0.4	<0.5	4.9	0.21	3.3	8	799	0.8	12.5	40	60.2
RM1255		8	1.2	57	0.5	<0.5	4.6	0.251	4	8.7	723	1.2	9.8	59	61.1
RM1256		11	1	48	0.3	<0.5	3.7	0.161	2.5	7.1	1087	0.6	10.3	70	42
RM1257		4	0.7	77	0.3	<0.5	3.9	0.182	2	11.6	1066	0.7	10.1	58	46.7
RM1258		9	0.9	104	0.4	<0.5	2.9	0.196	7.9	8.7	447	0.8	7.7	16	47.1
RM1259		5	0.9	153	0.3	<0.5	3.2	0.14	3.9	10	920	0.6	8.5	62	41.6
RM1260		4	1.3	124	0.4	<0.5	4.4	0.237	3.3	7.4	852	0.8	10.6	110	57.6
RM1261		9	1	75	0.4	<0.5	5.2	0.228	3.9	8.5	596	1	17.5	106	57.6
RM1262		29	1.3	99	0.4	<0.5	4.9	0.193	5.1	12.7	1849	0.9	18.7	474	58.2

Sample	Method:	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200
	Analyte:	Se	Sn	Sr	Ta	Te	Th	Ti	Tl	U	V	W	Y	Zn	Zr
	Unit:	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
RM1263		4	0.6	233	0.3	<0.5	3.8	0.156	3.3	5.1	435	0.7	94.4	559	63.3
RM1264		5	0.9	96	0.3	<0.5	3.7	0.156	3.5	11.4	856	0.6	29	144	55.8
RM1265		5	0.6	72	0.2	<0.5	2.6	0.132	4.3	13.1	241	0.7	13.9	20	43.1
RM1266		4	1.1	27	0.2	<0.5	2.7	0.122	3.1	8.2	826	0.6	7.2	16	35.3
RM1267		1	0.6	24	0.2	<0.5	2.2	0.101	1.1	6.9	269	0.4	7.6	16	30.9
RM1268		9	0.6	16	0.3	<0.5	3.1	0.126	1.8	5.7	378	0.5	10.7	24	41
RM1269		3	1.7	123	0.5	<0.5	6.4	0.279	6.8	10.1	1260	0.9	27.2	821	73.3
RM1270		3	1	73	0.4	<0.5	4	0.218	4.3	13.3	1452	0.6	25.5	534	66.7
RM1271		9	0.7	24	0.2	<0.5	2.8	0.125	1.3	5.4	2066	0.5	15.1	360	36.8
RM1272		10	0.6	29	0.2	<0.5	2.6	0.109	3.4	9.6	2598	0.6	29	534	40.4
RM1273		16	0.9	123	0.4	<0.5	5.4	0.207	4.5	21.2	2721	1	71.8	983	77.2
RM1274		23	1.6	36	0.3	<0.5	5.5	0.186	3.9	24.8	3555	1.1	107.4	2168	104.9
RM1275		20	1.2	136	0.5	<0.5	5.9	0.227	6.1	9.3	2044	0.8	39.6	1265	73.2
RM1276		3	2	99	0.6	<0.5	8.7	0.333	0.9	3.8	202	1	19.5	180	85.4
RM1277		2	1.9	104	0.6	<0.5	8	0.333	0.8	3.4	150	1	15.9	131	81.9
RM1278		3	1.6	113	0.5	<0.5	7.7	0.27	0.7	3.6	125	0.9	29.2	105	70.1
RM1279		2	1.5	115	0.4	<0.5	7	0.249	0.6	3	133	0.8	20.8	120	65.6
RM1280		3	1.3	112	0.4	<0.5	7.1	0.228	0.6	3.1	98	0.7	30.3	96	61.6
RM1281		2	1.6	82	0.5	<0.5	7.8	0.282	0.7	2.9	104	0.9	28.7	84	72.5
RM1282		1	2.1	49	0.6	<0.5	6.5	0.35	0.6	2.4	147	1.2	15	97	85.2
RM1283		2	1.9	72	0.6	<0.5	7.2	0.329	0.6	2.7	172	1	20.4	117	80.7
RM1284		<1	2.2	32	0.6	<0.5	6.8	0.366	0.6	1.9	101	1.3	11.3	83	89.8
RM1285		<1	2.1	39	0.5	<0.5	6.6	0.332	0.6	1.9	101	1.1	11.4	91	80.9
RM1286		5	1	84	0.3	<0.5	3.4	0.194	4.3	8.1	653	0.9	11.5	82	52.6
RM1287		8	0.9	78	0.3	<0.5	3.6	0.164	6	11.8	280	0.7	12.7	230	46.2
RM1288		10	0.8	184	0.3	<0.5	4.2	0.171	4.3	12.1	386	0.6	12.3	36	55
RM1289		3	1.5	35	0.4	<0.5	4.6	0.24	2.8	4.2	700	0.7	15.4	174	52.4
RM1290		4	1.2	62	0.3	<0.5	4.5	0.197	3.5	10.5	829	0.6	17.2	233	53.7
RM1291		15	0.9	49	0.3	<0.5	3.6	0.147	4	7.6	1695	0.6	31.5	1169	47.8
RM1292		10	0.7	36	0.2	<0.5	2.7	0.106	1.9	5.6	2292	0.5	22.8	507	33.1
RM1293		18	1	75	0.2	<0.5	3.1	0.125	3.9	11.7	2122	0.7	36.4	2176	52.3

Sample	Method:	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200
	Analyte:	Se	Sn	Sr	Ta	Te	Th	Ti	Tl	U	V	W	Y	Zn	Zr
	Unit:	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
RM1294		16	1.5	96	0.4	<0.5	5.9	0.253	7.1	11.5	2177	1	32.5	2151	76.9
RM1295		5	1.3	186	0.4	<0.5	5.4	0.207	1.5	7.7	871	0.7	26.9	319	66.1
RM1296		2	1.4	93	0.4	<0.5	5.7	0.231	0.7	4.4	321	0.6	24.6	144	63.7
RM1297		2	1.8	99	0.6	<0.5	7.4	0.31	0.9	4.9	335	0.9	25.4	201	84.7
RM1298		1	1.9	66	0.6	<0.5	6.8	0.316	0.8	4	227	0.9	17.8	120	78.2
RM1299		4	1.4	141	0.4	<0.5	6.4	0.227	0.7	4.4	217	0.7	28.1	216	69.1
RM1300		1	1.4	84	0.4	<0.5	5.9	0.255	0.6	3.2	193	0.7	14.4	112	66.2
RM1301		2	1.1	82	0.4	<0.5	5.3	0.206	0.5	3.2	180	0.6	18	90	55.1
RM1302		2	1.4	70	0.4	<0.5	6.2	0.246	0.7	4.1	257	0.7	20.1	135	69
RM1303		2	1.6	72	0.5	<0.5	6.4	0.259	0.7	4.4	242	0.8	20.9	110	70.9
RM1304		3	1.8	105	0.5	<0.5	6.6	0.283	0.7	3.8	228	0.8	21.2	180	76.6
RM1305		2	1.4	71	0.4	<0.5	5.8	0.231	0.6	4.3	197	0.7	21	92	67.9
RM1306		4	1.1	68	0.4	<0.5	5.4	0.211	0.8	5.7	365	1.3	23.4	128	62.7
RM1307		4	1.5	95	0.5	<0.5	7	0.301	1.4	6.4	542	1	27.1	312	83.6
RM1308		<1	1.1	113	0.4	<0.5	6.8	0.27	0.6	2.1	103	0.7	20.3	116	61.5
RM1309		<1	0.8	136	0.3	<0.5	5.3	0.203	<0.5	1.7	88	0.6	18.8	82	47.8
RM1310		2	1.9	79	0.6	<0.5	6.2	0.324	0.8	3.6	223	0.9	14	56	78.4
RM1311		2	1.8	82	0.6	<0.5	6.4	0.319	0.8	3.6	203	0.9	14.9	43	78.3
RM1312		1	1.4	71	0.4	<0.5	4.9	0.239	0.6	2.6	135	0.8	10.9	37	59.7
RM1313		2	1.2	76	0.3	<0.5	5.2	0.202	0.5	2.5	121	0.7	12.1	48	53.8
RM1314		2	1.4	95	0.4	<0.5	6	0.236	0.6	2.9	150	0.7	13.8	81	63.6
RM1315		2	1.5	119	0.4	<0.5	6.6	0.252	0.6	3.2	153	0.8	20.1	100	66.2
RM1316		11	0.8	27	0.2	<0.5	3.3	0.154	5.5	3.4	477	0.6	7.1	14	43.2
RM1317		10	0.9	39	0.2	<0.5	4.3	0.205	3.7	3.8	547	0.7	8.9	43	49.1
RM1318		42	1.2	82	0.3	<0.5	4.9	0.204	14.3	4.7	504	0.9	11.5	36	56.8
RM1319		8	1.3	78	0.5	<0.5	6.2	0.276	3.2	5	382	0.8	13.8	89	71.5
RM1320		5	1.1	72	0.4	<0.5	5.4	0.25	2.9	5	450	0.8	12.2	61	68.2
RM1321		9	1.1	56	0.3	<0.5	4.7	0.195	3.8	7.8	464	0.7	10.7	29	54
RM1322		7	1	55	0.3	<0.5	4.3	0.206	3.9	7.5	482	0.7	10.7	17	53.8
RM1323		5	0.9	41	0.3	<0.5	3.8	0.18	3.2	5.6	376	0.6	9.9	16	46.7
RM1324		8	1.3	110	0.4	<0.5	5.5	0.26	5.1	9.2	765	0.9	13.9	66	67.5

Sample	Method:	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200
	Analyte:	Se	Sn	Sr	Ta	Te	Th	Ti	Tl	U	V	W	Y	Zn	Zr
	Unit:	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
RM1325		9	1.2	129	0.4	<0.5	5.3	0.251	5	10.9	642	0.9	15	62	61.4
RM1326		11	1	72	0.3	<0.5	4	0.183	3.9	16.9	503	0.9	15.2	20	61.5
RM1327		2	0.7	49	0.2	<0.5	2.5	0.138	1.8	4.6	598	0.5	8	32	33.6
RM1328		6	1.1	83	0.4	<0.5	5	0.257	4.6	9.1	770	0.9	12.9	96	64.5
RM1329		8	0.8	80	0.2	<0.5	3	0.139	5.9	10	307	0.7	11.5	38	45.5
RM1330		4	0.5	40	0.2	<0.5	2.2	0.104	3.1	8.6	674	0.4	8.4	26	35.4
RM1331		11	1.3	122	0.5	<0.5	4.9	0.263	6.6	6.8	507	0.8	13	109	70.3
RM1332		3	1.3	69	0.4	<0.5	5	0.215	4.1	5.9	859	0.7	20.3	291	60.6
RM1333		5	1.5	71	0.4	<0.5	5.2	0.266	3.7	6.7	796	0.9	12.5	163	72.4
RM1334		10	1	85	0.3	<0.5	5	0.194	9.9	21.9	1842	0.8	44.2	2358	69.7
RM1335		10	1.1	88	0.4	<0.5	5.6	0.206	8.5	12.1	1917	0.8	47.2	3887	67.2
RM1336		10	1.1	201	0.4	<0.5	6.8	0.229	5.5	6.8	1972	0.8	65	3931	80.3
RM1337		30	1.3	90	0.4	<0.5	5.2	0.211	8.3	17	5030	1.2	54.5	6924	88.1
RM1338		21	1.1	178	0.3	<0.5	4.3	0.162	4.5	15.9	2361	0.8	57.5	1792	67
RM1339		17	1.2	82	0.3	<0.5	4.5	0.165	5.4	14.9	3376	0.9	35.8	2466	62.6
RM1340		13	1.6	139	0.4	<0.5	6.6	0.25	5.4	14.9	2203	1	37.3	4660	82.1
RM1341		13	1.4	183	0.4	<0.5	6.5	0.236	6.2	16.5	2476	1	40	3698	81.2
RM1342		12	1.1	312	0.3	<0.5	5.4	0.21	5.3	15.8	2084	0.8	38.9	2533	73.9
RM1343		2	1.6	103	0.5	<0.5	8.2	0.32	0.7	3.7	175	1	18.4	98	76.2
RM1344		2	1.1	154	0.4	<0.5	6.6	0.217	0.6	3.1	99	0.7	24.4	103	53.9
RM1345		4	2	191	0.6	<0.5	9.3	0.375	0.9	5.6	327	1.1	30.8	257	90.7
RM1346		2	1.9	84	0.6	<0.5	9.2	0.366	1	4.4	154	1.2	26.5	203	86.6
RM1347		3	1.7	94	0.6	<0.5	8	0.323	0.6	4.4	206	0.9	27.6	212	80.4
RM1348		1	2	60	0.5	<0.5	6.9	0.322	0.7	3.1	152	1.1	15.6	106	77.5
RM1349		3	1.7	118	0.6	<0.5	8.6	0.4	3	4.9	1347	1.1	24.6	1569	87.5
RM1350		7	0.8	49	0.2	<0.5	3.3	0.156	1.8	5.4	2479	0.6	24.9	487	44.1
RM1351		7	1.3	57	0.4	<0.5	5.3	0.26	2	5	1642	0.8	15.3	283	61.5
RM1352		4	1.5	130	0.5	<0.5	7.5	0.296	4.5	7.3	1257	0.9	28.8	1598	81
RM1353		3	1.6	113	0.5	<0.5	8	0.31	1.4	4.5	419	0.9	23	184	73
RM1354		2	1.6	122	0.6	<0.5	8	0.328	1.1	4.7	290	1	20.9	120	79.9
RM1355		2	1.7	142	0.6	<0.5	8.4	0.34	0.7	4.1	198	0.9	24	141	74.8

Sample	Method:	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200	MA200
	Analyte:	Se	Sn	Sr	Ta	Te	Th	Ti	Tl	U	V	W	Y	Zn	Zr
	Unit:	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
RM1356		2	1.8	84	0.6	<0.5	7.2	0.329	0.8	3.8	259	1	16.2	154	72.3
RM1357		3	1.5	160	0.5	<0.5	8.9	0.288	1	4.9	190	0.8	30.3	179	72.2
RM1358		2	1.9	120	0.7	<0.5	8.4	0.383	0.9	3.3	230	1.2	17.1	202	83.1
RM1359		<1	1.8	92	0.6	<0.5	8.4	0.375	0.8	2.7	128	1.1	14.7	107	85
RM1360		<1	1.7	112	0.6	<0.5	8.6	0.391	0.7	2.5	129	1	15.8	93	87.2
RM1361		<1	1.9	103	0.7	<0.5	8.5	0.416	0.8	2.5	136	1.1	13.8	95	84.6
RM1229_Repeat		14	1	78	0.4	<0.5	5.5	0.211	5	12	491	0.9	9.5	27	53.9
RM1243_Repeat		3	1.6	124	0.6	<0.5	7.5	0.312	0.8	4.2	195	0.9	24.7	264	80
RM1265_Repeat		6	0.6	72	0.2	<0.5	2.6	0.13	4.4	13.8	242	0.7	13.6	20	42.8
RM1301_Repeat		2	1.1	83	0.4	<0.5	5.1	0.208	0.5	3.1	179	0.6	17.1	90	54.6
RM1337_Repeat		31	1.4	91	0.4	<0.5	5.5	0.223	9	18.2	5060	1.3	55.7	7360	93
RM1361_Repeat		<1	1.9	107	0.7	<0.5	8.8	0.399	0.8	2.5	135	1.1	14.1	94	82.6
STD OREAS25A-4A		2	3.6	47	1.2	<0.5	13.6	0.947	<0.5	2.5	153	1.6	9.4	41	151.1
STD OREAS25A-4A		2	3.8	47	1.4	<0.5	15	0.971	<0.5	2.7	160	1.9	10	45	150.7
STD OREAS45H		2	1.9	29	0.9	<0.5	7	0.906	<0.5	1.6	279	0.8	9.8	39	122.6
STD OREAS45H		2	1.9	28	0.9	<0.5	6.5	0.937	<0.5	1.4	282	0.8	9.3	36	125.7
STD OREAS45H		2	1.9	27	0.8	<0.5	6.2	0.92	<0.5	1.4	276	0.8	8.9	37	119.2
STD OREAS45H		2	1.9	27	0.9	<0.5	6.8	0.903	<0.5	1.6	264	0.8	9.6	39	122.8
STD OREAS45H		2	2	30	0.9	<0.5	7.4	0.897	<0.5	1.6	283	0.8	9.8	40	126.7
STD OREAS501D		2	4.3	205	0.9	<0.5	12.9	0.37	0.9	3.7	73	9.2	15	87	65
STD OREAS501D		2	4.4	208	0.9	<0.5	12.3	0.38	0.8	3.3	70	8.8	15.2	83	63.3