

**POPES HILL TREND – REE's**  
**Popes Hill, Popes Hill JV, MRT Properties**

**Project Summary**

The PH rare earth element (REE) trend, a newly discovered area of rare earth mineralization, extends along the trans Labrador Highway (TLH) in a generally E-W to NE-SW direction from the Pope's Hill area, approximately 100 km from Happy Valley/Goose Bay (HVGB) along, and parallel to, the Churchill River to within 35 km of HVGB. The total strike length is approximately 100 km and the property position along the trend totals 2,694 claims including the PH (MP trend) – 62 claims, PH regional – 1695 claims, PHJV (50/50 JV with Great Western Minerals Group (GWMG)) - 759 claims and MRT property - 178 claims. Most of the claims are within 1-5 km of the TLH making access easy and lowering exploration costs significantly. The claims cover REE showings, lanthanum/cerium lake sediment anomalies in the Government database and structural features defined by government geological mapping. No previous REE exploration is documented for the area.

**Geological Setting**

The rock unit hosting the REE mineralization is a peralkaline, syenitic unit of late Paleoproterozoic age with green pyroxene crystals as either phenocrysts or porphyroblasts. Linear monzonite bodies, possibly related to thrust faulting documented by government geological mapping, lie just to the north and south of the mineralized area paralleling the highway to the northeast. The REE mineralization is associated with a syenitic intrusive unit in the Lower Brook metamorphic unit – mainly granitic gneisses, which has been noted 60 km to the northeast along the TLH and 40 km to the southwest of the TLH and at the original showings. REE mineralization is also found associated with pegmatites in the gneisses to the south of the MP trend on the original PH property and on the MRT property, 60 km to the east.

**Mineralogy**

The high REE values are found in a massive, dark grey to black, sub-metallic to glassy mineral, thought to be allanite with another reddish brown mineral (identified as titanite), in segregations which are variably non-magnetic to moderately magnetic.

Detailed work on the REE mineralogy is underway, supervised by Dr. John Hanchar, PhD, P.Geo., Professor and Head of the Earth Sciences Department of Memorial University of Newfoundland. Preliminary mineralogical results indicates that the REE's are associated with an alteration event, most likely potassic in nature, as shown by the strong microcline and other potassium (K) rich feldspars. The syenitic unit hosting the REE minerals has been altered and mineralized with titanite (sphene), allanite and apatite and feldspar carrying REE minerals, with other minerals such monazite, fergusonite and REE/iron rich pyroxenes also noted. Work is continuing using microprobe and other instruments. Results are pending.

**Planned Exploration 2012**

Diamond drilling will test targets located by the trenching and detailed prospecting on the PH and MRT properties in the winter of 2012. Follow up of regional targets defined in 2011 will be carried out in the summer of 2012. Exploration on the PHJV is dependent upon the results of the 2011 exploration.

## Exploration

### Popes Hill – MP trend – 100 % owned

Uranium, thorium and REE mineralization was first located in the Popes Hill area in 2006.. In the late fall of 2010, prospecting defined a 7 km trend carrying significant REE mineralization associated with radioactivity. TREE values up to 24.1 % and averaging 5.73 % were received from 31 grab samples. Samples are mostly rich in light rare earth elements (LREE), but the more anomalous values give higher values in HREE..

Individual high values for the elements, all in the highest grade sample (941432) were: La – 5 %, Ce – 9.7 %, Pr – 1.08 %, Nd - 3.85 %, Sm – 0.70 %, Eu – 213 ppm, Gd – 0.56 %, Tb – 828 ppm, Dy – 0.47 %, Ho – 875 ppm, Er – 0.23 %, Tm – 283 ppm, Yb – 0.14 %, Lu – 175 ppm, with a Y value of 2.11 % for TREE+Y of 24.07 %. In this sample LREEs were 20.34 % (92.6 % of the TREEs) and HREEs were 1.63 % (7.4 % of the TREEs) for a total of 21.97 % REEs. Other significant values in this sample included: Nb – 911 ppm, Zr – 604 ppm, Th – 0.63 % and U – 461 ppm. High values in the other elements associated with the more highly anomalous REEs were: U – 261 ppm, Ta – 90.6 ppm, Zr – 2.33 %, and Nb – 0.59 %. All of the REE bearing samples are weakly to moderately radioactive with significant Th content (up to 0.7 %) but generally 0.1-0.3 % and minor uranium values (up to 461 ppm but generally < 100 ppm).

Magnetic, VLF-EM and radiometric (spectrometer) surveys were carried out in December 2010. Lithological/alteration trends strike in a 070 degree (ENE) direction and magnetic anomalies both positive and negative and VLF-EM anomalies and three crosscutting, probable fault or shear structures, trending at approximately 150/330 degrees are noted. Radiometric results were inconclusive due to winter conditions (cold, snow and ice).

In 2011, exploration included: diamond drilling - 1120 m in 10 drill holes (PH-11- 1 to 10) tested the MP pit showing on the TLH; an airborne radiometric /high resolution magnetic/ VLF-EM survey along the trend; regional stream sediment geochemistry and prospecting; prospecting/geology and trenching and sampling on the PH MP property and the MRT property; line cutting on the PH MP property and a wide spaced soil grid on the MRT property.

The drilling was designed to test TREE mineralized bedrock and float samples from the MP pit, VLF-EM anomalies thought to represent shear systems, and magnetic anomalies which could reflect the variably magnetic TREE mineralization. The drilling tested an approximate 700 m long zone of the 7 km mineralized trend, in the MP showing area. Wide zones, up to 140 m of > 0.1 % REE mineralization was found with 4 holes giving widths in the 50 m range. Narrow (0.1-0.3 m) zones of higher grade TREE values in the 1 to 6 % range are also found throughout most of the drill holes. In addition strong Zr values generally > 1,000 ppm (0.1 %) were noted over wide intervals associated with the REE mineralization.

The syenitic units carry disseminated brown crystals (titanite ?) which are variably radioactive. Nb and Th values are variably anomalous also with values up to 816 ppm Nb and 764 ppm Th, with higher values in these elements associated with the higher TREE values. The diamond drilling defined an area of anomalous REE mineralization hosted in syenitic units in the primarily granitic gneisses, however the high grade massive REE mineralization noted in the pit was not intersected in the drilling. Geological mapping indicates that the area is cut by numerous faults making structural control more difficult than expected and possibly disrupting the REE bearing units and exploration in 2011 has shown that the area drilled lies to the south of the main mineralized trend which was not tested by this drilling.

Prospecting using scintillometers to locate radioactive mineralization on the MP trend has traced REE mineralization in outcrop over an approximate 2.8 km strike length. The zone is laterally continuous,

extending from just north of the MP showing in the pit on the TLH, through the T1 and T2 showings located 800 and 1,100 m, respectively, to the T5 and T6 showings located 2,000 and 2,200 m respectively in the vicinity of the brook where a boulder running 24.1% TREE was found in 2010.

Outcrops with massive segregations of mineralization consisting of allanite, titanite and apatite are located at the MP showing, and in all the "T" showings with other areas of mineralization noted between the showings. The mineralized unit, a syenitic unit, conformable with the granitic gneisses, a minimum of 10 m wide, carries green pyroxene crystals, as phenocrysts or porphyroblasts, up to 5 cm long, and is open along strike to both the east and west. The massive, high grade, segregations, up to 30 cm wide, which typically run 10-25% TREE, are characterized by pinch and swell structures with at least two parallel massive segregations, separated by 5-6 m of host rock, noted in the T2, T5 and T6 exposures, with other parallel zones carrying massive narrow veins and disseminations in the host unit.

In the T1/T2 area, over an approximate 600 m strike length, 28 outcrop/subcrop grab samples gave an average of 8.6% TREE including 6 host rock samples with values < 1% (0.1 to 0.9%). HREE values ranged from 2.7% to 47.6%, averaging 12.7%, with 16 > 10% HREE. The average values for the REE's are: 16,652 ppm (1.67%) La, 36,417 ppm (3.64%) Ce, 4,135 ppm (0.41%) Pr, 15,351 ppm (1.54%) Nd, 2,552 ppm (0.26%) Sm, 62 ppm Eu, 1,977 ppm (0.2%) Gd, 287 ppm Tb, 1,512 ppm (0.15%) Dy, 261 ppm Ho, 633 ppm Er, 74 ppm Tm, 379 ppm Yb, 49 ppm Lu, and 5,716 ppm (0.57%) Y. These are selected grab samples and therefore are not representative of the overall values in the zone.

A trenching program along the MP trend exposed the favourable, REE anomalous, syenitic unit, which carries the high grade segregations, over the approximate 2.8 km long trend. A series of 14 trenches from 100 to 500 m apart evaluated the zone. Total count values from background (< 100 counts per second) to weakly anomalous (200-400 cps) to > 5000 cps were located, with REE mineralization noted in a number of areas, both disseminated and as massive segregations up to 30 cm wide, in two hand dug trenches, 5 and 11A. Another trench, # 15, located approximately 200 m from the TLH, to the south of the MP trend, gave anomalous (> 300 cps) to strong (> 2000 cps) radioactivity in three zones over widths up to 25 m. Mineralization in the trench 15 area is related to pegmatite veining carrying REE minerals such as allanite, similar to the MRT REE mineralization located 60 km to the east. Twelve (12) trenches were channel sampled, with approximately 290 samples taken over widths varying from 10 cm to 2 m. Results are pending.

#### **PH Regional - 100 % Owned**

Stream sediment geochemical sampling and limited prospecting has been completed with a total of approximately 550 samples taken at 300 m intervals on streams draining the prospective areas to the north and west of the Churchill River over the 100% owned properties. A number of radioactive zones were noted in the prospecting surveys with rock samples taken from these areas. Results are pending.

#### **PHJV (w/ Great Western Minerals Group) – 50 % owned**

GWMG is the operator with funding at 50/50 at least for the first year. Regional exploration in 2011 included airborne radiometrics/magnetics/VLF-EM, prospecting, geological mapping, and geochemistry. Results are pending.

#### **MRT Option – Option to earn 100 %**

The property was acquired after prospectors located REE values up to 8.95%. Regional exploration in 2011 included airborne radiometrics/magnetics/VLF-EM, stream sediment geochemistry (68 samples) and prospecting. Detailed prospecting, trenching and a wide spaced soil survey (316 B horizon)

evaluated the more prospective areas located during the regional exploration. Rock samples gave a number of significant REE values over a 2 km<sup>2</sup> area in the southwestern part of the property. An area approximately 800 m in strike length in the western part of the property gives four significant TREE values ranging from 2.17% to 7.05% in limited sampling. Th values for the higher REE values are generally in the 0.1 to 0.2% range. Four U values > 500 ppm U (635, 727, 881, 1,870 ppm) were located in the southern part of the property unrelated to the high REE values. Th – max 391 ppm, gives a U/Th ratio of approximately 2-3 to 1. All samples are selected grab samples, based on radioactivity.

Trenching/channel sampling tested two REE mineralized areas, approximately 75 m apart, in the southern part of the property. Weakly to moderately anomalous radioactive units up to 25 m wide, consisting of felsic and mafic gneisses with values in the 250 to 500 cps range, cut by radioactive pegmatitic units, up to 1.5 m wide, with values up to > 2000 cps, were exposed. REE mineralization, mainly allanite and associated green pyroxenes was noted in the pegmatites. Results for the regional streams, soils and trench channel samples remain pending.