

## Montviel Core Zone REE Mineral Resource Estimate Technical Report, Quebec

Respectfully submitted to: Geomega Resources Inc.

> Effective Date: September 29<sup>th</sup>, 2011

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those obtained from quarter spirt check samples (000)



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#### 1- Summary

SGS Canada Inc. ("SGS Geostat") was commissioned by Geomega Resources Inc. ("Geomega") on June 15<sup>th</sup>, 2011 to prepare an independent estimate of the mineral resources of the Montviel Core Zone Rare Earth Element (REE) deposit. The mineral resource estimate was completed by SGS Geostat based on data available from recent drilling data collected by Geomega during the 2010 and early 2011 (prior to June 30<sup>th</sup>) exploration programs. The mineral resource estimate was completed in accordance with National Instrument 43-101 Standards and Disclosure for Mineral Projects. This report represents the first NI-43-101 compliant resource estimation on the Montviel Core Zone. Although the Montviel Core Zone is principally a REE deposit hosted in a carbonatite, it does contain Niobium and Phosphate concentrations that are potentially economically extractable.

The Montviel Property ("Property") is in the Abitibi Region of Quebec Canada, in Montviel Township. It is located approximately 97 km by road from the town of Lebel-sur-Quevillon and is accessible via a network of logging roads. The property consists of 216 claim cells for 11998.71Ha.

Geologically, the Montviel property is located in the eastern part of the Superior geological province, at the contact between the Opatica and Abitibi sub-provinces, just north of the Waswanipi – Saguenay extensional corridor (Saguenay rift). The mineralization is hosted within the Montviel carbonatite complex, part of the Montviel alkaline intrusion; dated at 1,894Ma. Regional metamorphism is generally greenschist facies, with amphibolite facies observed in the vicinity of the intrusions. The Montviel alkaline intrusion measures approximately 10 x 3 km for a total of 32 km<sup>2</sup>. The carbonatite core covers an approximate area of 3km<sup>2</sup> (Goutier 2006).

The property has been explored since 1958 by multiple exploration companies searching for various commodities. The most interesting historical values were obtained by Nomans Resources in 2002 and include: 0.41% Nb<sub>2</sub>O<sub>5</sub> over 7 m in Hole MV-02-01; 1.1% REE over 10.8 m also in Hole MV-02-01; and 6.35% P<sub>2</sub>O<sub>5</sub> over 107 m in Hole MV-02-03. Niogold acquired the property in 2002 and undertook, soil sampling, airborne geophysics, mapping and prospecting. In December 2010 Geomega and Niogold Mining Corporation ("Niogold") initiated a 10,065m drill campaign from which the resources reported herein were estimated.

All the claims within the Montviel Property are held 100% by Geomega; all the claims have a Net Output Return Royalty of either 2% or 3%. The core of the property, including claims that host the resources estimated herein, was formerly held by Niogold. Niogold retains a 2% Net Output Return royalty on this portion of the Property with no buyback rights.

As part of the independent verification program, the authors of the report validated the exploration methodology which includes core logging, sampling, analytical procedures, and quality analysisquality control protocol implemented by Geomega. SGS Geostat also completed a validation of the drill hole database as part of the verification program. The authors and SGS Geostat are of the opinion that the data quality is acceptable and that the final drill hole database is adequate to support a NI-43-101 compliant mineral resource estimate.

The mineral resource block model was derived from the geological interpretation and modeling of the mineralized carbonatite at Montviel. The resource model is defined by blocks 10x10x10 meters



in size, located below the bedrock/overburden interface. Interpolation of the block grade was performed using ordinary kriging from composited analytical data in multiple successive passes using anisotropic search ellipsoids increasing in size from one pass to next. Finally, a mineral resource was estimated based on the results of the block model interpolation. The bulk of the mineral resources were classified as indicated with the remainder occurring as inferred resources. Sufficient bulk density data was available to interpolate and estimate the final tonnage of the mineral resources.

The final mineral resource estimate for the Montviel Core Zone at a base case cut-off grade of 1% TREO totals 183.9Mt tonnes grading 1.45% TREO of indicated resources and 66.7Mt grading 1.46% TREO of inferred resources (Table 1).

Cut-off Grade TREO (%)	Resource Category	Tonnes	Average Bulk Denisty (t/m³)	TREO (%)	LREO (%)	IREO (%)	HREO (%)	Y2O3 (%)	Nb2O5 (%)
0.85	Indicated	196,200,000	2.91	1.420	1.372	0.037	0.004	0.007	0.123
1.00	Indicated	183,900,000	2.92	1.453	1.404	0.037	0.004	0.007	0.126
1.25	Indicated	136,000,000	2.92	1.562	1.511	0.039	0.004	0.007	0.135
1.50	Indicated	69,200,000	2.92	1.744	1.688	0.043	0.005	0.008	0.158

Table 1. Resource summary of the Montviel Core Zone.

Cut-off Grade TREO (%)	Resource Category	Tonnes	Average Bulk Denisty (t/m³)	TREO (%)	LREO (%)	IREO (%)	HREO (%)	Y2O3 (%)	Nb2O5 (%)
0.85	Inferred	72,600,000	2.89	1.417	1.366	0.038	0.005	0.008	0.136
1.00	Inferred	66,700,000	2.89	1.460	1.408	0.039	0.005	0.008	0.140
1.25	Inferred	48,100,000	2.88	1.587	1.533	0.041	0.005	0.008	0.153
1.50	Inferred	26,800,000	2.87	1.755	1.696	0.045	0.005	0.008	0.177

Notes:

- Effective date September 29, 2011.
- Mineral resources are not mineral reserves and do not have demonstrated economic viability.
- Total Rare Earth Oxides (TREO) include: La2O3, Ce2O3, Pr2O3, Nd2O3, Sm2O3, Eu2O3, Gd2O3, Tb2O3, Dy2O3, Ho2O3, Er2O3, Tm2O3, Yb2O3, Lu2O3, Y2O3.
- Light Rare Earth Oxides (LREO) include: La2O3, Ce2O3, Pr2O3 and Nd2O3.
- Intermediate Rare Earth Oxides (IREO) include: Sm2O3, Eu2O3 and Gd2O3.
- Heavy Rare Earth Oxides (HREO) include: Tb2O3, Dy2O3, Ho2O3, Er2O3, Tm2O3, Yb2O3 and Lu2O3.

SGS Geostat is in the opinion that the Geomega successfully discovered and outlined the mineral resource potential of the Montviel's Core Zone based on 2010 and 2011 exploration programs and considers the project to be sufficiently robust to warrant the following work:

- Additional drilling in the south-western portion of the zone to better define and potentially model an independent high-grade zone.
- Additional drilling in the northwest portion of the Montviel Core Zone to challenge the current geological interpretation.
- Test the concentrations of Niobium and Phosphate in the overburden covering the Montviel Core Zone.
- Initiate environmental, geotechnical, hydrogeological and metallurgical studies to better assess the modifying factors to the economic potential. The metallurgical study is particularly important due to the relatively high level of uncertainty regarding the production of saleable



products from REE deposits. Each deposit has its own characteristics and challenges with this regard.

- Initiate a Preliminary Economic Assessment to test the potential economic viability of the resources within the Montviel Core Zone.
- Continue constructive interactions with the Grand Council of Crees, the Cree First Nation of Waswanipi and the citizens of Lebel-sur-Quevillon. A strong relationship with local stakeholders is the key to obtaining a social license necessary to operate any potential future mining activity.

#### **2-Introduction**

#### 2.1 General

This technical report was prepared by SGS Canada Inc. – Geostat ("SGS Geostat") for Geomega Resources Inc. ("Geomega") to support the disclosure of mineral resources for the Montviel Property ("Property" or "Project"). The report describes the basis and methodology used for modeling and estimation of the Montviel Core Zone REE deposit located on the property from drill holes completed by Geomega during the 2010 and 2011 exploration programs (prior to June 30<sup>th</sup>, 2011). The report also presents a full review of the history, geology, sample preparation and analysis, and data verification of the project. The report also provides recommendations for future work.

SGS Geostat was commissioned by Geomega on June 15<sup>th</sup> 2011 to prepare an independent estimate of the mineral resources of the Montviel deposit. Geomega supplied electronic format data from which SGS Geostat generated and validated a final database.

#### 2.2 Terms of Reference

This report on the mineral resource estimation at the Montviel Property was prepared by Guy Desharnais Ph.D. P.Geo. and Claude Duplessis Eng.. Mr. Duplessis was responsible for the site visit, independent validation of the resource estimate and sections 1-6 of this technical report. Dr. Desharnais was responsible for the data verification and validation, geological modelling, resource estimates and sections 7-24 of this technical report.

This technical report was prepared according to the guidelines set under "Form 43-101F1 Technical Report" of National Instrument 43-101 Standards and Disclosure for Mineral Projects. The certificate of qualification for the Qualified Person responsible for this technical report has been supplied to Geomega as a separate document and can also be found at the very end of the report.

Mr. Duplessis visited the Property between June 27<sup>th</sup> and June 29<sup>th</sup>, for a review of exploration methodology, sampling procedures and to conduct an independent check sampling of selected mineralised drill intervals.

All measurements in this report are presented in "International System of Units" (SI) metric units, including metric tonnes (tonnes) or grams (g) for weight, metres (m) or kilometres (km) for distance, hectare (ha) for area, and cubic metres (m<sup>3</sup>) for volume. All currency amounts are Canadian Dollars (\$) unless otherwise stated. Abbreviations used in this report are listed in Table 2.

tonnes or t	Metric tonnes
kg	Kilograms
g	Grams
km	Kilometres
m	Metres
μm	Micrometres
ha	Hectares
m <sup>3</sup>	Cubic metres
km/h	Kilometre per hour
%	Percent sign
t/m <sup>3</sup>	Tonnes per cubic metre
\$	Canadian Dollars
0	Degree
°C	Degree Celcius
NSR	Net smelter return
ppm	Parts per million
NQ	Drill core size (4.8 cm in diameter)
SG	Specific Gravity
NTS	National Topographic System
UTM	Universal Transverse Mercator
NAD	North America Datum
Ga	Billion years
REE	Rare Earth Elements
REO	Rare Earth Oxides

#### Table 2. List of Abbreviations

		Conversion			
Name	Symbol	Factor	Oxide	Subgroup	Group
Lanthanum	La	1.1728	La2O3		
Cerium	Ce	1.1713	Ce2O3	Light REO	
Praseodymium	Pr	1.1703	Pr2O3	(LREO)	
Neodymium	Nd	1.1664	Nd2O3		
Samarium	Sm	1.1596	Sm2O3	Internetation	
Europium	uropium Eu		Eu2O3		
Gadolinium	Gd	1.1526	Gd2O3	REO (IREO)	
Terbium	Tb	1.151	Tb2O3		TREO
Dysprosium	Dy	1.1477	Dy2O3		
Holmium	Но	1.1455	Ho2O3		
Erbium	Er	1.1435	Er2O3	HEAVY REU	
Thulium	Tm	1.1421	Tm2O3	(HKEU)	
Ytterbium	Yb	1.1387	Yb2O3		
Lutetium	Lu	1.1372	Lu2O3		
Yttrium	Y	1.2699	Y2O3	Transition	
Niobium	Nb	1.4305	Nb2O5	Metal	
Phosphorus	Р	2.2916	P2O5	Non-metal	

Table 3. Elements of interest, oxide species and conversion factors.

#### 2.3 Source of Information

Information in this report is based on critical review of the documents, information and maps provided by personnel of Geomega, in particular Kateri Marchand, Chief Geologist. A complete list of the reports available to the authors is found in the References section of this report. Drilling data was primarily obtained from Geomega and validated against information obtained during the field visit and directly from the analytical laboratory. Property descriptions were summarized primarily from a recent and comprehensive geological report prepared by Géologie Québec (Goutier 2006). Historic work was largely summarized from the previous technical report prepared for Geomega by Solumines (2010). The authors would like to thank the Geomega technical team for their collaboration, especially Kateri Marchand P.Geo who supervised and logged most of the drill core at Montviel for Geomega.



#### 2.4 Site visit

The author has visited the site between June 27th and June 29th 2011. The personal inspection was positive; the work sites were clean and well maintained, organisation and work process was up to international standards and best practices. Geomega has installed an exploration camp near the Montviel carbonatite deposit. The workers live in temporary mobile home during exploration campaigns. The drill core is cross-piled on wooden pallets and was in the process of being transferred into newly constructed core racks (Figure 1). The site is constantly monitored.

All drill sites are marked by wooden stakes identified with the drill hole number in addition to steel rod on the casing cap. The author was able to locate the drill holes and verify their location using a hand held GPS. All holes that were visited had a GPS position consistent with that recorded in the database. SGS is satisfied with evidence of exploration on the site and has no reason to doubt the authenticity of boreholes.





Office and core logging facility



Core boxes on wood pallet



Inside core logging facility Figure 1. Photos of the site installations

Inside core cutting facility





Drill access path with identified casings 2011Identified casing 2010 campaign (MVL-10-01)Figure 2. Photographs of casings encountered in the field during the site visit.

#### 2.5 Disclaimer

It should be understood that the mineral resources which are not mineral reserves do not have demonstrated economic viability. The mineral resources presented in this Technical Report are estimates based on available sampling and on assumptions and parameters available to the authors. The comments in this Technical Report reflect the authors' and SGS Geostat best judgement in light of the information available.

## **3- Reliance on Other Experts**

The authors of this technical report are not qualified to comment on issues related legal agreements, royalties, permitting, and environmental matters. The authors have relied upon the representations and documentations supplied by the Company management. The authors have reviewed the mining titles, their status, the legal agreement and technical data supplied by Geomega, and any public sources of relevant technical information.

Unlike common metals, REEs, Nb and Y are not sold on public exchanges and evaluating their prices is not as straightforward. Prices for these metals tend to fluctuate strongly due to 1) a relatively small and growing market; 2) the very limited production outside of China; 3) speculation as to the future demand. For this study metal prices were derived from a three year weighted average obtained from <u>www.asianmetal.com</u>. Comparisons were made with other recent technical reports and price assumptions available which showed that the price assumptions were well within range of other experts. These prices were used to establish a minimum cut-off grade for the REE.



## 4- Property Description and Location

The Montviel property is located 215 km NNE of the town of Val d'Or, 93 km NNE of the town of Lebel-sur-Quevillon and 50 km north of the town of Miquelon. Geographically, the property is located in NTS sheets 32F15 and 32F16 and is centered at UTM coordinates 389,530E/5,521,970N.

The Montviel property consists of one block covering an area of 11998.47Ha (Table 4). The property has 4 gaps in it that are held by another mining company. The property boundaries have not been surveyed. When a mining title is acquired by map designation in Québec, there is no need to survey the cells boundaries, as they are already defined by the NTS geographical coordinate system.

All 216 claims are in good standing with renewals due in 2012 and 2013. The accumulated exploration expenditures has a total of 106,232.24\$; this does not include 2010 and 2011 expenditures which are expected to exceed 4,500,000\$. The total exploration expenditure necessary to exercise the next claim renewal is 298,800\$ with an administration cost of 11,501\$. It is therefore expected that sufficient funds and credits are in place to keep the property in good standing.

All the claims within the Montviel Property are held 100% by Geomega, and have a Net Output Return Royalty of either 2% or 3%. The core of the property, including claims that host the resources estimated herein, was formerly held by Niogold mining Corporation ("Niogold"). These claims are illustrated in green on Figure 4. Niogold retains a 2% Net Output Return royalty on the Montviel Property with no buyback rights. Geomega will, upon securing 70% of the capital requirements for commercial production, as specified in an eventual feasibility study for the Montviel Property, pay \$4,500,000 to Niogold in cash or common shares at the election of Niogold. This amount shall be treated as non-refundable advanced royalty payment.

A series of claims were staked jointly between Niogold and Geomega. These claims, shown in yellow in Figure 4 are subject to the same 2% Net Output Return Royalty described above. In March 2011 several claims were optioned from Pierre Perron and Fan Wen shown in blue in Figure 4. These claims are subject to a 1% Net Output Return Royalty to Niogold and 2% to either Fan Wen or Pierre Perron.



Figure 3. Satellite image showing the location of the Montviel Property in northern Abitibi, Quebec, Canada.

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Figure 4. Claims map of the Montviel Property showing the different agreements in effect. The Montviel Core Zone is entirely within the central claims in green.

There are no known environmental liabilities on the property. The property is covered by swamps streams and forests. Logging has been undertaken on parts of the property. The Nomans River crosses the property but is not expected to impact any future mining development on the property as it is more than 100m from the interpreted limit of the mineralized carbonatite. Some of the northern claims are covered by the Goéland-Waswanipi hydro-electrical reservoir and may not be accessible for mining (Figure 5). The Montviel Alkaline intrusion, which hosts the Montviel Core Zone, is not present on these claims.





Figure 5. Claims map from <u>http://www.mrnfp.gouv.qc.ca</u> showing the limits of the potential flood zone caused by the Goéland-Waswanipi hydro-electrical reservoir (red).



Table 4. List of claims. All claims are map	-staked claims in Québec (CDC type).
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	Surface	Date of		Surface	Date of		Surface	Date of
Title	area (Ha)	Acquisition	Title	area (Ha)	Acquisition	Title	area (Ha)	Acquisition
108	55.59	18/07/2003	2214171	55.54	15/04/2010	2253703	55.58	13/10/2010
112	55.57	18/07/2003	2214172	55.52	15/04/2010	2253704	55.57	13/10/2010
118	55.56	18/07/2003	2214174	55.52	15/04/2010	2253706	55.57	13/10/2010
119	55.55	18/07/2003	2214175	55.52	15/04/2010	2253707	55.57	13/10/2010
120	55.52	18/07/2003	2214176	55.51	15/04/2010	2253710	55.59	13/10/2010
122	55.51	18/07/2003	2214178	55.51	15/04/2010	2253715	55.59	13/10/2010
123	55.54	21/07/2003	2214179	55.5	15/04/2010	2253718	55.58	13/10/2010
94141	55.58	15/09/2005	2214180	55.5	15/04/2010	2253719	55.58	13/10/2010
94143	55.54	15/09/2005	2214182	55.5	15/04/2010	2253726	55.57	13/10/2010
94144	55.54	15/09/2005	2214183	55.5	15/04/2010	2253727	55.57	13/10/2010
94145	55.54	15/09/2005	2214184	55.5	15/04/2010	2253728	55.57	13/10/2010
94140	55.53	15/09/2005	2214185	55.49	15/04/2010	2253729	55.57	13/10/2010
94148	55.53	15/09/2005	2214187	55.49	15/04/2010	2253735	55.56	13/10/2010
94149	55.55	15/09/2005	2214188	55.49	15/04/2010	2253736	55.56	13/10/2010
94150	55.55	15/09/2005	2214189	55.48	15/04/2010	2253737	55.50	13/10/2010
1005979	55.53	04/04/2001	2214191	55.48	15/04/2010	2253743	55.55	13/10/2010
1005980	55.52	04/04/2001	2234423	55.49	19/05/2010	2253791	55.6	13/10/2010
1005981	55.52	04/04/2001	2234424	55.49	19/05/2010	2253792	55.6	13/10/2010
1005983	55.51	04/04/2001	2234426	55.48	19/05/2010	2253794	55.6	13/10/2010
1011032	55.58	05/06/2001	2234427	55.48	19/05/2010	2253795	55.6	13/10/2010
1011033	55.58	05/06/2001	2234428	55.47	19/05/2010	2253796	55.59	13/10/2010
1011034	55.57	05/06/2001	2234429	55.47	19/05/2010	2253797	55.59	13/10/2010
1011036	55.57	05/06/2001	2234431	55.47	19/05/2010	2253799	55.59	13/10/2010
1011037	55.57	05/06/2001	2234432	55.47	19/05/2010	2253800	55.58	13/10/2010
1011038	55.57	05/06/2001	2234433	55.47	19/05/2010	2253801	55.58	13/10/2010
1011035	55.57	05/06/2001	2240300	55.5	12/07/2010	2253802	55.57	13/10/2010
1011041	55.56	05/06/2001	2240302	55.49	12/07/2010	2253804	55.57	13/10/2010
1011042	55.56	05/06/2001	2240303	55.49	12/07/2010	2253805	55.57	13/10/2010
1011043	55.50	05/06/2001	2240304	55.48	12/07/2010	2253800	55.50	13/10/2010
1011045	55.56	05/06/2001	2240306	55.47	12/07/2010	2253808	55.56	13/10/2010
1011046	55.56	05/06/2001	2240307	55.47	12/07/2010	2253809	55.55	13/10/2010
1011047	55.55	05/06/2001	2240308	55.40	12/07/2010	2253810	55.55	13/10/2010
1011049	55.55	05/06/2001	2240310	55.46	12/07/2010	2253812	55.55	13/10/2010
1011050	55.55	05/06/2001	2240311	55.46	12/07/2010	2253813	55.54	13/10/2010
1011051	55.55	05/06/2001	2240312	55.46	12/07/2010	2253814	55.54	13/10/2010
1011053	55.55	05/06/2001	2240314	55.46	12/07/2010	2253816	55.54	13/10/2010
1030165	55.55	12/10/2001	2240315	55.46	12/07/2010	2253817	55.54	13/10/2010
1030166	55.54	12/10/2001	2253675	55.61	13/10/2010	2253818	55.54	13/10/2010
1030168	55.54	12/10/2001	2253677	55.61	13/10/2010	2253820	55.53	13/10/2010
1105928	55.58	02/12/2002	2253678	55.61	13/10/2010	2253821	55.53	13/10/2010
1105929	55.57	02/12/2002	2253683	55.6	13/10/2010	2253822	55.53	13/10/2010
1105931	55.56	02/12/2002	2253685	55.6	13/10/2010	2253824	55.53	13/10/2010
1105932	55.56	02/12/2002	2253686	55.6	13/10/2010	2253825	55.53	13/10/2010
1105933	55.56	02/12/2002	2253687	55.6	13/10/2010	2253826	55.53	13/10/2010
1105935	55.55	02/12/2002	2253689	55.6	13/10/2010	2253827	55.53	13/10/2010
1105936	55.55	02/12/2002	2253690	55.6	13/10/2010	2253829	55.51	13/10/2010
1105937	55.55	02/12/2002	2253691	55.59	13/10/2010	2260590	55.61	15/11/2010
1105938	55.55	02/12/2002	2253692	55.59	13/10/2010	2260591	55.61	15/11/2010
1105940	55.54	02/12/2002	2253694	55.59	13/10/2010	2260593	55.61	15/11/2010
1105941	55.53	02/12/2002	2253695	55.59	13/10/2010	2260594	55.61	15/11/2010
2208562	55.52	02/12/2002	2253696 2253697	55.59	13/10/2010	2260596	55.6	15/11/2010
2208564	55.57	08/03/2010	2253698	55.58	13/10/2010	2260598	55.6	15/11/2010
2214167	55.59	15/04/2010	2253699	55.58	13/10/2010	2260599	55.6	15/11/2010
2214168	55.59	15/04/2010	2253700	55.58	13/10/2010	2260600	55.6	15/11/2010
2214109	55.56	15/04/2010	2253701	55.58	13/10/2010	2261015	55.61	19/11/2010



# 5- Accessibility, Climate, Local Resources, Infrastructure and Physiography

Parts of this section were summarized from the Solumines Report (2010) after validation for accuracy.

The property has a relatively flat topography, ranging from 280m to 315m above sea level. The average elevation is approximately 290 m above sea level. The main hydrographic feature is the Nomans River, which crosses the property in a SW-NE direction. It flows to the NE, where it joins the Inconnue River, then the Maicasagi River, and ultimately, Maicasagi Lake. The property is covered by a mix of swamp and forest, the latter consisting mainly of black spruce. Part of the property was logged several years ago. As observed in drill holes, the overburden thickness varies from 0 to a maximum vertical depth of 78 m but is generally less than 35m over the carbonatite. Permafrost does not occur at this latitude.

The property is easily accessible from the town of Lebel-sur-Quevillon using highway 113 for 60 km in the direction of Chibougamau. Upon reaching kilometer marker 170 one follows the 1018 logging road for 50km. The 1018 is a major logging road, which branches off to a network of secondary logging roads that provide access to the property. Heavy equipment, like drills, can be mobilized directly to the property via road (Figure 6)

There is no mining infrastructure on the property; however, a logging camp called Camp Goeland is located close to the south limit of the property at UTM coordinates 389,360E / 5,515,625N. Supplies, services and qualified manpower are available in Lebel sur Quevillon, about 115 km by road to the SSW, or in Val d'Or, approximately 270 km to the SSW by road from the Montviel property. There is an electric power line along highway 113 about 50 km south of the property.

The area lies at the limit between the subarctic and humid continental climates. This climate zone is characterized by long, cold winters and short, cool summers. Daily average temperatures range from -20°C in January to +16.1°C in July. Break-up usually occurs in early April, and freeze-up in November. These are normal climatic conditions for the Abitibi region, where exploration work is usually conducted year round.

Johnstone

Duchesr





Figure 6. Local access map to the Montviel Property area (shaded rectangle).



## 6- History

Parts of this section were summarized from the Solumines Report (2010) after validation for accuracy. Table 5 summarizes the historic work completed on the Montviel property. No historic resource, reserve estimate or production is recorded within the Montviel property.

The area was first visited in 1895 by Robert Bell of the Geological Survey of Canada, followed later by Bancroft (1912), Cooke (1927), Lang (1932), Norman (1937), and Freeman (1938).

In 1949, P.E Imbeault produced the first geological map of the property area on behalf of the Quebec Department of Mines, at the scale of 1:63,360. Carbonatite rocks are not mentioned in his report. With the exception of some large scale mapping projects, the next major study was conducted by the Quebec Government (MRNFQ) by Jean Goutier in 2004-2005. The Montviel carbonatite complex is extensively described in Report # RG 2005-05 and #RG 2006-04. Goutier et al. established the age of the Montviel carbonatite complex at 1,894.2  $\pm$  3.5 Ma. Goutier and McNicoll (2008) established the 2,708  $\pm$ 1.2 Ma date for the Nomans tonalite, which hosts the Montviel carbonatite complex.

The first exploration work on the property and its vicinity was reported by F.H Jowsey Ltd. in 1958. Eighteen miles of lines were cut and a Turam survey was completed. This was followed by six diamond drill holes for a total of 588.7 m; this includes three drill holes lost in overburden. The main lithologies intersected consisted of iron formation (magnetite layers in a tuffaceous horizon), recrystallized limestone, greywacke and chloritic tuffs. It is likely that the lithologies described as recrystallized limestone are actually carbonatite. Turam anomalies were explained by narrow sections of pyrite/pyrrhotite and/or graphite; no assay results were reported.

The property remained dormant from 1958 to 1973. Exploration resumed in 1973 with geological reconnaissance and an airborne (Mag and EM) Dighem survey by Duval International Corporation. This was followed-up by line cutting and ground magnetic surveys over eight selected targets and by prospecting on the major magnetic and EM anomalies. A total of 46 basal till samples were collected which did not reveal significant anomalies. The core from Jowsey drilling was found and assayed for base metals, uranium, thorium and columbium. During the 1973-1974 program, geologists working for Duval Corp. found a grid of lines and a drilling platform: this work was apparently performed by Umex Exploration, and was never reported.

In 1976, the Société de Development de la Baie James ("SDBJ") and Duval International Corp. formed a joint venture, which drilled 20 holes for a total of 2,589 m from 1977 to 1979. Eighteen of these hit the bedrock, and two were lost in overburden. The objective of these campaigns was to test geophysical anomalies associated with the carbonatite complex and Nb<sub>2</sub>O<sub>5</sub> concentrations. The Duval/SDBJ joint venture remained active until at least 1981; however no additional drilling was reported.

In 1979, Birkett prepared an evaluation report on the Montviel carbonatite on behalf of Shell Canada Ltd. Its conclusion states that the main target at this time was uranium-thorium mineralization. In 1988, Corona Corporation staked 55 claims to cover the central part of the Montviel carbonatite complex. The only work reported is a geological compilation and a search for the core drilled by Duval/SDBJ in 1977-1979.



No work was completed from 1989 to 2000. In 2000, the property was acquired by Nomans Resources. In January 2001, Berthelot and De Corta completed an evaluation report on the Montviel carbonatite complex on behalf of Nomans. Nomans undertook an exploration program in 2002 with 13.3 km of line cutting followed by 13.9 km of ground EM surveying (HLEM) and the completion of eight drill holes totalling 1,245.5m. Two of these did not hit the bedrock because of overburden as thick as 78m. The purpose of this drilling was to validate the results of the Duval/SDBJ drilling, namely the Nb<sub>2</sub>O<sub>5</sub> intersected in holes 77-1, 79-1 and 79-3; as well as 4 geophysical anomalies.

In 2002, the property was optioned by Niogold Mining Corp. (Niogold) from Nomans Resources. Technical reports in the following years highlighted the carbonatite potential for hosting phosphorous, niobium, REE, thorium, fluorite, barite, copper and PGE deposits, in different phases of the carbonatite, and the possibility of high grade residual niobium, apatite (P2O5), titanium and vermiculite deposits. In 2003, Fugro Airborne surveys completed an EM, Mag and radiometric survey with a 100m line-spacing over the Montviel property. In 2005, Y. Ghanem, geophysicist, reprocessed the data from the same survey, covering the complex and its surroundings to aid and facilitate geological interpretation. In April 2005, T. Mulja prepared a mineralogical study which described the following paragenetic sequence: calcite  $\rightarrow$  siderite/dolomite  $\rightarrow$  strontianite  $\rightarrow$  REE-bearing carbonate  $\rightarrow$  witherite. Pyrochlore occurs mostly as subhedral grains associated with biotite and secondary carbonates, and rarely as euhedral inclusions in pyrite.

The last work reported by Niogold was completed in 2005 and consisted of soil geochemistry surveys followed by geological mapping and prospecting. The report recommended that drilling be undertaken on 4 Mobile Metal Ion (MMI) anomalies that were outlined (Henriksen 2006).

In 2010 Geomega optioned the property from Niogold and started a 22 drill hole campaign totaling 10,065m. Two of these drill holes were lost shortly after intersecting bedrock. The drilling targeted the carbonatites within the Montviel intrusion and encountered significant REE mineralization in most of the drill holes. The resources outlined in this report were derived solely from this most recent drill campaign.

	P	Result			
GSC and MRNQ	Visit of the area by Bell, Bancroft, Cooke, Lang, Norman and Freeman.				
Quebec Department of Mines RG 20	Mapping of the area at the scale of 1 mile = 1 inch	Montviel carbonatite not observed.			
F.H. Jowsey Ltd GM 07548-A	18 miles of Turam survey				
F.H. Jowsey Ltd GM 07548-B	6 DDH totalling 588.7 m	Iron formation and <u>recrystallized limestone</u> intersected. Turam conductor explained by pyrite-pyrrhotite, and graphite.			
Quebec Department of Mines RG 20	Report by Maurice Latulippe, resident geologist	Holes position indicated on location map.			
Duval International Corp. GM 29954	Dighem Mag and EM airborne survey.				
Duval International Corp. GM 31071	Ground EM and Mag survey, basal till sampling and assaying of core drilled by Jowsey in 1958	Best assay of 0.27% Nb2O5 over 3 m in Hole 3B			
Duval / SDBJ GM 33767	10 drill holes totalling 1,063.7 m	Best results of 0.26% Nb2O5 over 13.4 m in 77-1.			
Duval / SDBJ GM 34761	10 drill holes totalling 1,525.6 m	Best results of 0.68% Nb2O5 over 1.5 m in 79-1 and 0.1% Nb2O5 over 91.4 m in Hole 79-3			
Shell Canada Ltée GM 39043	Reconnaissance (evaluation) report on the Montviel carbonatite	At this time, Shell considered U-Th to be the most promising target on the property.			
Corona Corporation GM 48820	Staking of 55 claims to cover the central part of the carbonatite.	Geological compilation and search for old drill core.			
Nomans Resources GM 59681	Evaluation report	Drilling recommended			
Nomans Resources GM 59646	13.3 km of line cutting and 13.9 km of MaxMin survey	Conductive zones identified at a depth of less than 25 m.			
Nomans Resources GM 59647	1,245.5 m drilled in 8 holes	Best results of 0.15% Nb2O5 over 10.7 m in DDH-1 and 0.27% Nb2O5 over 3m in Hole DDH-3B			
MRNFQ RG 2005-05	Mapping of the area and description of the Montviel carbonatite complex	Extensive geological and potential description of the Montviel carbonatite complex.			
MRNFQ RG 2006-04	Several age dates completed in the area covered by the geological survey reported in RG 2005-05	Montviel carbonatite complex dated at 1,894.2±3.5 Ma			
MRNFQ RP 2008-02	3 additional age dates in the area.	Dating of the Nomans tonalite, which contains the Montviel carbonatite complex, at 2,708.9 ± 1.2 Ma.			
NioGold Mining Corp.	Technical report on the Montviel carbonatite complex	Not filed with the MRNFQ			
NioGold Mining Corp.	Technical report on the Montviel carbonatite complex	Not filed with the MRNFQ			
NioGold Mining Corp. GM 61778	Fugro airborne EM, Mag and radiometric survey				
NioGold Mining Corp	NI 43-101 Technical Report				
NioGold Mining	Report on the Fugro Airborne survey				
NioGold Mining Corp	Re-processing of the Fugro data to aid geological interpretation.				
NioGold Mining Corp. GM 62424	Geochemical orientation surveys, geological mapping, prospecting and soil sampling program (MMI and B-Horizon)	4 anomalous areas were discovered, and 4 drill holes recommended			
NioGold Mining Corp. GM 62438	Mineralogical Study on the Nomans drill holes				
GéoMégA Current Report	GéoMégA options property from NioGold and completes 20 drill holes for 10,065m.	1.51% TREO over 520.65 m in MVL 11-15 and 2.15% TREO over 250.65 m in MVL 11-18. 183.9 Mt Indicated Resources at 1.45% TREO and 66.7 Mt Inferred at 1.46% TREO.			
	GSC and MRNQ Quebec Department of Mines RG 20 F.H. Jowsey Ltd GM 07548-A F.H. Jowsey Ltd GM 07548-B Quebec Department of Mines RG 20 Duval International Corp. GM 29954 Duval International Corp. GM 31071 Duval / SDBJ GM 33767 Duval / SDBJ GM 39043 Corona Corporation GM 48820 Nomans Resources GM 59646 Nomans Resources GM 59646 Nomans Resources GM 59647 MRNFQ RG 2005-05 MRNFQ RG 2006-04 MRNFQ RG 2006-04 MINFQ RG 2006-04 MINING Corp. NioGold Mining Corp. NioGold M	GSC and MRNQ       Visit of the area by Bell, Bancroft, Cooke, Lang, Norman and Freeman.         Quebec       Department of         F.H. Jowsey Ltd       6 DDH totalling 588.7 m         GW 07548-A       8 DDH totalling 588.7 m         Quebec       Department of         Department of       Report by Maurice Latulippe, resident geologist         Mines RG 20       Duval         Duval       Ground EM and Mag survey, basal till sampling and assaying of core drilled by Jowsey in 1958         Duval       Jowsey Ltd         GM 33071       10 drill holes totalling 1,063.7 m         Duval / SDBJ       Gorund EM and Mag survey, basal till sampling and assaying of 5c claims to cover the central part of the carbonatite         Corona       Staking of 55 claims to cover the central part of the carbonatite.         Nomans       Resources         Evaluation report       GM 48820         Nomans       1,245.5 m drilled in 8 holes         MSMFQ       Mapping of the area and description of the geological survey         Nomans       1,245.5 m drilled in 8 holes         MS9645       Survey         Nomans       1,245.5 m drilled in 8 holes         MS9646       Survey         Nomans       1,245.5 m drilled in 8 holes         MS96461       Survey			

Table 5. Compilation of historical work completed on the Montviel Property.

## 7- Geological Setting and Mineralization

#### 7.1 Regional Geology

The Montviel property is located in the eastern part of the Superior province in the core of the Canadian Shield. The metamorphic grade in the area is typically of greenschist facies, except in the vicinity of intrusive bodies, where it can reach amphibolite or even granulite facies. According to Goutier (2005), the area covered by the Montviel property is located in the Abitibi sub-province and is adjacent to the south limit of the Opatica sub-province (Figure 7). Superior Province rocks range in age from 2600Ma to 3800Ma; locally however, rocks typically have ages between 2600Ma and 2850Ma. Proximal to the Montviel Property, the Abitibi comprises volcanic, sedimentary and plutonic rocks deformed during the Kenoran Orogeny. The Opatica comprises volcanic and plutonic rocks (dominated by tonalitic), grey gneisses and some younger granitoids (Goutier 2006). The contact between the provinces is interpreted as representing a collision zone between an ocean basin and a craton, with south dipping shear zones, and a major north dipping subduction of the Abitibi.



Figure 7. Geological map of the Superior Province showing the position of the Montviel Property. Base map taken from the MRNF website.

#### 7.2 Local Geological Setting

The Montviel Alkaline intrusion is hosted by the Nomans tonalite, dated at 2,708.9 Ma. The Nomans tonalite is highly deformed and represents a window at the core of a dome structural feature. It is foliated and contains two horizons of diorite as well as granitic dykes (Goutier 2006). The regional metamorphism is generally at the greenschist facies, with the amphibolite facies seen in the vicinity of the intrusive. The Montviel Alkaline Complex is younger, weakly metamorphosed and practically undeformed.

The local geological setting is shown in Figure 8; the legend and stratigraphy are illustrated in Figure 9. Alkaline Intrusions and particularly carbonatites are interpreted to form in extensionally tectonic environments. Previous authors have suggested that the Montviel carbonatite is located in the Saguenay failed-rift (Waswanipi – Saguenay corridor). In MB 99-35, Moorhead et al. locate the Montviel carbonatite between the Nottaway and Waswanipi – Saguenay corridors, and just north of the latter. The Crevier Township, Grevet and Montviel carbonatites are located in close proximity to the Waswanipi – Saguenay corridor (Figure 10).



Figure 8. Geological Map of the contact between the Abitibi and Opatica Provinces (Goutier and Mcnicoll 2008). Note the Montviel intrusion (purple) is located near the center of this map. The yellow outline denotes the Montviel Property; dark shaded areas are excluded. Legend is presented in Figure 9.





Figure 9. Age dates and age of deformation within the contact area between the Abitibi and Opatica Provinces (Goutier and Mcnicoll 2008). Note the Montviel intrusion (purple) at the top.







6

Grevet carbonatite

3 Dolodau carbonatite



#### 7.3 Geological Setting of the Property

The Montviel property covers most of the Montviel Alkaline Intrusion, which is oriented ENE with an approximate size of 10 km x 3 km for a total of 32 km<sup>2</sup>. The Geomega Property covers about 90% of the intrusion. The Montviel intrusion is significantly younger, than surrounding rocks at 1,894 Ma and is relatively undeformed, and is interpreted to dip steeply to the NNW (Goutier 2006). The Montviel carbonatite complex and its various units are illustrated in Figure 11.

The Montviel carbonatite is constituted of six main rock units named Pmtv 1 to 6. The descriptions herein are summarized from the Goutier (2006).

Pmvt 1 is composed of pyroxenite and peridotite with variable amounts of biotite. It has highest magnetism of all the units within the intrusion; likely a function of the presence of magnetite. The Pmvt 1 unit occurs as 4 separate zones which are rarely exposed.

The Pmvt 2 unit is composed of syenite, melanosyenite and biotite bearing pyroxenite. It is characterized by biotite enrichment, weaker regional magnetism and a miaskitic geochemical affinity; where (Na + K)/Al < 1. Carbonate and potassic alterations are the two most common types observed.

Pmvt 3 is the main intrusive unit, and has been defined from the outcrops observed mainly in the west part of the intrusion and by historical drilling. This unit is made up of ijolite, urtite, syenites and ultramafic intrusions with an agpaïtic geochemical affinity, where (Na + K)/Al > 1. Pmvt 4 is located in the south central part of the intrusion. It is composed of a granite observed in drill holes MV-02-05 and 79-10.

The Pmvt 5 unit comprises carbonatites and silicocarbonatites found in the central part of the intrusion. This unit covers 2.76 km<sup>2</sup> in the central part of the intrusion, and 2.9 km<sup>2</sup> in the west part of the intrusion. The central part is weakly magnetic, and does not outcrop, but has been intersected by many drill holes. The carbonatite can be further subdivided into: ferrocarbonatite, apatite-bearing ferrocarbonatite, silicocarbonatite and pyrrhotite-bearing calciocarbonatite. This unit hosts the REE, Nb and P mineralization and is discussed further in other sections of this report.

Pmvt 6 is a polygenetic intrusive breccia with a carbonatite matrix, located at the top of the central carbonatite unit. It outcrops north of Nomans River, and is commonly intersected in drill core. The breccia is generally massive, with several joints. It is made up of ultramafic fragments derived from the Pmvt 1and Pmtv 3 units. They vary from angular to rounded, and range in size from several mm to decimetres with rare metric blocks. Some fragments are fresh, and others are carbonate-altered.

The Montviel alkaline intrusion is different from those seen elsewhere in the world, because of its abundant ferrocarbonatites, and the presence of pyrrhotite-bearing calciocarbonatites. In the other complexes, the carbonatites are dominated by calciocarbonatites (which are magnetite and sulphide depleted) and magnesiocarbonatites.





Figure 11. Property scale geological map (NTS 32F15; Goutier 2006). Shaded areas are gaps in the property. The approximate shape and orientation of the Montviel Core Zone is shown as the red oval.

#### 7.4 Montviel Core Zone

The REE and Nb mineralization is widespread within the Calciocarbonatite and Ferrocarbonatite units at the core of the Montviel Intrusion. Grades tend to be somewhat lower within the apatitebearing carbonatite and richer with depth (near the outer contact with the silicocarbonatite) (Figure 12, Figure 13). All of the drill holes within the Montviel Core Zone encountered significant REE intersections (Table 6).

The extents of the mineralization as encountered in drilling to date can be traced for a maximum of 690m in the NE-SW direction and 580m in the NW-SE direction and a depth of 540m. It is open in all directions although drilling at the SW (MVL-11-09) and NE (MVL-11-12 and 13) suggests a pinching of the mineralization. The NW limit should represent the updip portion of the mineralization as suggested by the layering of ferrocarbonatite and calciocarbonatite and REE grades, especially evident below 300m depth (Figure 13). The current interpretation of this NW contact is that the lithologies are abruptly cut-off by the silicocarbonatite and polygenetic breccia units. It is felt by the authors that there is insufficient drilling across this contact to establish this relationship, particularly at shallow depths. This is discussed further in the recommendations section of this report. The SE is very much open, however the richest mineralization is trending deeper in this direction (downdip).

The most significant intersection is within drill hole MVL-11-18 which intersected 250.65 meters of 2.14% TREO and 2,953ppm Nb. This drill hole is located in the SW sector of the model and suggests that a higher grade zone is present near surface in this sector.



Figure 12. Geological map related to the Montviel Core Zone. See Figure 5 for the approximate location within the Geomega property. Yellow: Inter-layered Calciocarbonatite and Ferrocarbonatite; Green: Silicocarbonatite; Pink: Calciocarbonatite; Teal: Polygenetic Breccia; Red-Stippled: apatite-bearing Carbonatite.



Figure 13. Current geological interpretation of section 3W within the Montviel Core Zone.

				TREO	Nb	P2O5	Fe2O3	SiO2
Hole Name	From	То	Length	(%)	(ppm)	(%)	(%)	(%)
MVL-10-01	90.15	501	410.85	1.32	535	0.15	23.6	2.8
MVL-10-03	21.3	451.7	430.4	1.49	1,007	0.94	22.3	3.3
MVL-11-04A	70.4	243.45	173.05	1.18	779	0.63	22.6	7.4
MVL-11-05	68	429	361	1.23	944	0.89	22.3	7.1
MVL-11-06	33.55	519	485.45	1.43	798	2.59	23.4	5.8
MVL-11-07	29.4	519	489.6	1.27	898	1.46	19.4	5.2
MVL-11-08	20.1	501	480.9	1.38	551	0.49	20.7	4.0
MVL-11-09	27	154.55	127.55	1.50	699	0.05	18.6	10.4
MVL-11-10	22.4	567	544.6	1.41	761	2.56	24.0	5.2
MVL-11-11	348.4	495	146.6	1.13	948	0.48	25.7	7.4
MVL-11-12	231	468.15	237.15	1.16	1,257	0.36	22.0	7.9
MVL-11-13A	164.45	252	87.55	1.13	1,081	0.8	20.0	11.1
MVL-11-14	29.5	453	423.5	1.27	746	1.33	20.7	7.2
MVL-11-15	28.35	549	520.65	1.50	913	0.8	21.1	4.0
MVL-11-16	27.5	621	593.5	1.30	765	2.02	23.5	5.5
MVL-11-18	28.55	412.1	383.55	1.83	1,579	1.32	22.5	5.3
including	133.55	384.2	250.65	2.14	2,953	0.27	21.2	6.4
MVL-11-19	50.75	334	283.25	1.39	763	0.46	19.7	5.7
MVL-11-20	36.05	507	470.95	1.02	589	1.41	24.0	9.7

Table 6. Summary of drilling results from the 2010-2011 drill campaign within the Montviel Core Zone.

## 8- Deposit Types

The Montviel mineralization collectively termed Montviel Core Zone is hosted within the carbonatites at the center of the Montviel Alkaline intrusion (Figure 11, Figure 12 and Figure 13). Carbonatites are defined as intrusive or extrusive igneous rocks composed of more than 50 percent, by volume, carbonate minerals. They typically occur within zoned alkaline complexes with other under-saturated alkaline rocks (feldspathoidal syenites and rocks of the ijolite suite), and can form intrusive plugs, dykes or sills (Wolley and Kemp 1989). In this case the carbonatite appears to form the core of the concentrically zoned intrusion. The zoning itself is currently poorly defined due to lack of outcrop and drilling however there is a general trend from ultramafic to felsic and extremely evolved magma (carbonatite) at the core. The process for enrichment of REE, Nd and P appears merely to be a function of these elements being incompatible in the common rock forming minerals and are successively enriched in the residual magma till they are eventually incorporated in unusual minerals due to their relatively high concentrations.

Due to the extreme enrichment of trace elements and the great spectrum in magma composition necessary to produce the observed rock types it is likely that the magma evolved in, and was periodically fed from, a deeper subchamber. Assuming that the all the rocks observed within the Montviel Intrusion are coeval it follows that they were the product of fractional crystallization of ultramafic magma (the least evolved phase present). For illustrative purposes: a typical ultramafic magma from the Proterozoic contains around 4ppm Ce (Desharnais 2004). An ultramafic magma chamber of 5km by 5km by 5km would be necessary to account for the Ce present within the inferred and indicated resources reported herein; itself, a fraction of the total Ce contained in the Montviel Intrusion. Magma was likely pumped into the Montviel intrusions periodically which brought with it fragments of the rocks that were previously crystallized (autoliths). These autoliths are observed in many places often near lithological contacts (Goutier 2006) (Figure 12, Figure 13, Figure 14). Collectively these breccias are termed the polygenetic breccias and are drawn by Geomega geologists as linear zones resembling dykes. These breccia zones are typically weakly mineralized with respect to REE; potentially a function of dilution by foreign blocks. In some instances the breccia unit is relatively enriched in REE.

Carbonatite-related deposits are classified as magmatic or metasomatic types (Richardson and Birkett, 1996), and their supergene equivalents (Mariano, 1989). The Montviel Core Zone appears to be of the magmatic type as illustrated by its apparent correlation with lithological units (Figure 14). Local remobilization and concentration is very likely (although not directly observed) due to the fact that the REE is hosted in carbonate minerals, which are readily dissolved and precipitated.

REE and Nb mineralization is disseminated in ferrocarbonatite and calciocarbonatite. The general trend appears to be an increase in grade towards the contact with the silicocarbonatite, followed by a significant drop-off within this unit. The  $P_2O_5$  rich unit appears to represent the core of the intrusion and follows this trend (lower REE and Nb grades overall). A schematic drawing illustrates the authors' model for the concentric zoning of lithologies and enrichment (The best intersection to date (MV-11-18: 250.65m at 2.1% TREO and 0.30% Nb) appears to be located near this contact at the SW limit of the body.



The mineralogy is interpreted from a limited number of samples (7) taken from a very heterogeneous body and should be considered preliminary. The primary hosts to the REEs are Babearing fluoro-carbonates. The most important are huanghoite  $BaREE(CO_3)_2F]$  and cebaite  $[Ba_3Ce_2(CO_3)_5F_2]$ , followed by minor subordinate qaqarssukite  $[Ba(Ce,REE)(CO_3)_2F]$  and a BaSrNaREE phase. Pyrochlore  $[(Na,Ca)_2Nb_2O_6(OH,F)]$  is the primary Nb bearing phase and monazite  $[(Ce,La,Nd,Th)PO_4]$  is present in varied amounts. Fergusonite  $(YNbO_4)$  is also observed but is rather rare. Apatite is the main phosphate bearing phase. In the  $P_2O_5$  rich rocks the REEs appear to be hosted primarily by monazite (single sample). A more detailed mineralogical description is available in the "Mineral Processing and Metallurgical Testing" section.



Figure 14. Schematic diagram illustrating the interpreted concentric zoning of lithologies and associated enrichment. This diagram is not to scale and does not reflect the relative proportions of each unit. This could represent a slice in any direction within the intrusion. All these units are within the Pmtv5 unit of Goutier 2006.

The Montviel Intrusion is rather unusual in that its carbonatitic core is significantly enriched in sulphides in the form of pyrrhotite, pyrite, sphalerite and galena. The Palabora alkaline intrusion in South Africa represents another example where the presence of sulphides are noted (Econ Geol 1976). In fact, the first drill holes on the Montviel complex were testing EM anomalies which were explained by pyrrhotite mineralization. The best result was 1.07% Zn and 0.18% Mo over 1.7 m intersected in Hole MV-02-03, in a silicocarbonatite. The best Cu result was 0.48% in a grab sample in the eastern part of the intrusion, at the contact between the Pmvt 3 and Pmvt 5 units in an altered syenite (Goutier 2006). Other sulphide bearing carbonatites are known to contain economically significant concentrations of PGE (Pt, Pd, Rh) (Rudashevsky et al. 2001). PGE data is only currently available from a single historical drill hole (MV-02-04A) within Montviel Intrusion; measured values were below the detection limit within this drillhole.

## 9- Exploration

Geomega's primary exploration objective was to drill the core of the Montviel Intrusion. A Fugro airborne magnetic, electromagnetic and radiometric survey was flown at a 100m spacing over the newly acquired claims. A 3 week mapping and prospecting campaign was undertaken in August 2011. Additionally, 4 lines of soil sampling were completed over the Montviel Core Zone as well as 2 on a magnetic anomaly in the northern part of the property. Results on the mapping, prospecting soil geochemistry were not available as of the writing of this report.

## 10- Drilling

Geomega undertook a drill campaign in 2010 and 2011 to evaluate the REE, Nb and Phosphate potential of the carbonatite core of the Montviel intrusion. Drilling was aligned with the help of the magnetic maps from the Fugro Airborne survey as well as the mapping completed by Goutier (2006). The first hole MV-10-01 intersected 410.85m of 1.33% TREO. In total Geomega has completed 22 NQ-diameter core drill holes, of which 2 were lost soon after intersecting bedrock (

Table 7). Eighteen of the remaining 20 drill holes intersected significant REE mineralization (Table 6). Some of these intersections contain higher grade sections; however they do not in any case carry significant waste sections.

The 2010-2011 drill campaign was planned on sections 100m meters apart and trending AZ330°. The typical distance between holes is 100m; however several holes were collared on the same drill setup and in some cases proposed locations were altered due to topographic issues. The end result is a grid approximates a 100m spacing with some slight offsets. Most of the drilling was oriented along the sections, with the noted exception of drill hole MVL-11-18 which was oriented at Az286.5° to attempt to intersect the contact with the silicocarbonatite at a perpendicular angle. These orientations of all the holes are near the perpendicular to the stratigraphy and the lengths of intersections are considered good approximations of true length.

Deviations were measured with the use of a Flex-It device which measured the azimuth with the use of magnetic compass. The on-site geologist analyzes the azimuth readings and accepts or rejects them based on the deviation from the expected value and magnetic susceptibility in the rock. Overall 46 of 178 of the azimuth measurements were rejected (25%).

On-site geologists were responsible to shut-down drill holes after verification of the most recent drill core and comparing with the updated drill sections. Unfortunately, the style of mineralization as well as the mineralogical controls on the REEs was not well understood during the 2010-2011 drilling campaign and several drill holes were ended in mineralized calciocarbonatite or ferrocarbonatite (MVL-11-06, 08, 10, 11, 14 and 15). The average grade of the final composite assay within these six drill holes is 1.4% TREO at a down-hole depth of 530m. Most of the holes have been drilled across the mineralized mass.

Drill access on the property was achieved through a network of small roads or trails. In lightly forested areas the trees and brushes were cut prior to drill mobilization. Water for the drilling operation was supplied by surface pumps in ponds. In some cases water was observed seeping from drill hole casings for days following completion of drill holes. This is evidence of positive hydrological pressure in the area.

Drill holes are spotted by the on-site geologist with a hand-held GPS unit and compass. Planned holes locations were marked by pickets, and completed holes are resurveyed using the DGPS equipment. Measurements are taken at the centre of the top of the casing, as well as at ground level at the side of the casing. In the case of inclined holes, the ground-level measurement is taken at the leading edge of the casing. In most cases, the drill casings were left in-ground after the holes were completed.

Core was retrieved from the drill string using conventional wire line techniques. Core was removed from the core tube by drill contractor employee and carefully placed in standard NQ wooden core boxes; a wooden bloc was put in the box at the end of each run (3 metres). Once filled, core boxes were closed and sealed. Boxes were removed from the drill site twice daily (at the end of each shift) by drill contractor personnel and delivered to the Geomega exploration facility at Montviel. The core boxes were then placed in the core shack for logging and marking with sampling intervals. Afterward the core boxes were transferred into the detached core cutting facility.



Figure 15. Plan map of 2010-2011 drilling.


Hole Name	Easting	Northing	Elevation	Azimuth	Dip	Length (m)	Hole Type	Claim Number
MVL-10-01	390184	5520388	283.8	332	-60	501	NQ	1011052
MVL-10-02	389166	5519481.7	289.5	340	-45.5	498	NQ	1011045
MVL-10-03	389932	5520225.5	283.0	327.7	-55	534	NQ	1011046
MVL-11-04	390089	5520551	284.9	316	-53	60	NQ	1011052
MVL-11-04A	390090	5520550.1	284.9	327	-53	459	NQ	1011052
MVL-11-05	390090	5520549.3	284.9	326	-67	483	NQ	1011052
MVL-11-06	390005	5520114.4	283.2	323	-55	519	NQ	1011046
MVL-11-07	390013	5520279.5	283.1	330	-55	531	NQ	1011046
MVL-11-08	390111	5520327.4	283.5	320.4	-55	501	NQ	1011052
MVL-11-09	389762	5520062.3	284.7	327	-54	501	NQ	1011046
MVL-11-10	390146	5520146.3	282.1	324	-55	567	NQ	1011046
MVL-11-11	390311	5520277.5	282.3	327	-54	591	NQ	1011046
MVL-11-12	390289	5520415.4	283.1	330	-60	495	NQ	1011052
MVL-11-13	390230	5520513	283.4	333	-55	72	NQ	1011052
MVL-11-13A	390232	5520512.1	283.4	333	-58	252	NQ	1011052
MVL-11-14	390050	5520419.2	284.2	330	-53	453	NQ	1011052
MVL-11-15	390113	5520326	283.3	302.3	-83	549	NQ	1011052
MVL-11-16	390073	5520165.9	282.6	330	-55	621	NQ	1011046
MVL-11-17	390495	5520390	285.0	330	-56	468	NQ	1011053
MVL-11-18	389942	5520211.2	283.1	286.5	-54	477	NQ	1011046
MVL-11-19	389876	5520335.3	283.6	325.3	-55	426	NQ	1011046
MVL-11-20	390035	5520041.7	283.1	328.3	-65	507	NQ	1011046

Table 7. Summary of drill holes completed in 2010-2011 by Geomega.

# **11- Sample Preparation, Analyses and Security**

All samples used in the resource estimation are from split NQ core, which is logged, split and bagged on site. Samples were then shipped to, and analysed by, ALS Minerals.

The drill core is logged in the core shack; sampling intervals are drawn by a geologist to respect geological contacts typically varying from 1 to 1.5 meters with a few exceptions outside these limits. All drill holes are sampled from beginning to end. The core is split using a diamond saw; half the core is returned to the core box as a witness, while the other half is bagged with the appropriate tag (matching the one left in the core box). The sample number is also inscribed on the sample bag with a marker. Each plastic sample bag is stapled and put into a rice bag along with instructions and a sample list. Rice bags are labelled and then shipped in batches to ALS Minerals' preparation laboratory in Val d'Or Québec. A blank, a standard and a duplicate are inserted every 50 samples (corresponding to a sample tag booklet); this amounts to 6% of analyses destined to QA/QC. For the blanks and standards, these are at fixed numbers ending with 00, 25, 50, 75. Geomega protocol states that duplicates are selected from highly mineralized intervals and represent <sup>1</sup>/<sub>4</sub> split core.

Once cut and bagged, the sample information are saved into an access database. Thereafter sample bags are only opened at ALS laboratory. The drill core samples were sent for preparation at ALS Minerals in Val-D'Or, Quebec. The analyses were performed at ALS Vancouver facility.

ALS Global conducted all analyses in their Vancouver laboratory. Trace elements were analyzed by lithium metaborate fusion, followed by ICP-MS, major elements by ICP-AES, and niobium by XRF. All ALS Minerals laboratories are certified ISO 9001:2000 for the "supply of assays and geochemical analysis services" by BSI Quality Registrars. Certification for ISO 9001:2000 requires evidence of a quality management system covering all aspects of the organization. ALS Minerals also takes part in the "Proficiency Testing Program - Minerals Analysis Laboratories" and holds a certificate demonstrating its success in the program for analysis of REE. All samples received by ALS Minerals are processed through a sample tracking system that is an integral part of that company's Laboratory Information Management System (LIMS). This system utilizes bar coding and scanning technology that provides complete chain-of-custody records for every stage in the sample preparation and analytical process and limits the potential for sample switches and transcription errors.

The sample preparation was completed according to Prep-31 (Figure 16): samples are dried, and then crushed to 70% passing Tyler 10 meshes (2 mm). A 250 g subsample is split off the crushed material, and pulverized to 85% passing Tyler 200 meshes (75 microns). Crushing and pulverizing equipment is cleaned with barren wash material between sample preparation batches and, where necessary, between highly mineralized samples. Sample preparation stations are also equipped with dust extraction systems to reduce the risk of sample contamination.





Figure 16. Flow chart showing the sample preparation methodology of ALS Minerals.

Samples are dissolved by adding 0.200g to the metaborate lithium flux (0.90 g), mixed and fused at 1000 degrees celcius. Afterward it is dissolved in 100ml acid made of 4% HNO3 and 2% HCl. This solution is then analysed by ME-ICP06 (Figure 17) for the major elements, including  $P_2O_5$  and ME-MS81(Figure 18) for the trace elements (including REEs, Y, Nb). Please see the ALS website for details on these methods.



Element	Symbol	Units	Lower Limit	Upper Limit
Aluminum	Al <sub>2</sub> O <sub>3</sub>	%	0.01	100
Barium	BaO	%	0.01	100
Calcium	CaO	%	0.01	100
Chromium	Cr <sub>2</sub> O <sub>3</sub>	%	0.01	100
Iron	Fe <sub>2</sub> O <sub>3</sub>	%	0.01	100
Magnesium	MgO	%	0.01	100
Manganese	MnO	%	0.01	100
Phosphorus	P <sub>2</sub> O <sub>5</sub>	%	0.01	100
Potassium	K <sub>2</sub> O	%	0.01	100
Silicon	SiO <sub>2</sub>	%	0.01	100
Sodium	Na <sub>2</sub> O	%	0.01	100

Figure 17. Table of elements analysed by ICP-AES (code ME-ICP06).

					Flowert	Cumber!	Inter	Lower	1
					Liement	Symbol	Units	Limit	
					Lanthanum	La	ppm	0.5	ſ
					Lutetium	Lu	ppm	0.01	t
				Molybdenum*	Мо	ppm	2	t	
					Niobium	Nb	ppm	0.2	t
					Neodymium	Nd	ppm	0.1	T
					Nickel*	Ni	ppm	5	T
					Lead*	Pb	ppm	5	t
					Praseodymium	Pr	ppm	0.03	t
					Rubidium	Rb	ppm	0.2	t
Element	Symbol	Units	Lower	Upper	Samarium	Sm	ppm	0.03	t
	· ·		Limit	Limit	Tin	Sn	ppm	1	t
Silver*	Ag	ppm	1	1000	Strontium	Sr	ppm	0.1	t
Barium	Ba	ppm	0.5	10000	Tantalum	Та	ppm	0.1	t
Cerium	Ce	ppm	0.5	10000	Terbium	Tb	ppm	0.01	t
Cobalt*	Со	ppm	0.5	10000	Thorium	Th	ppm	0.05	t
Chromium	Cr	ppm	10	10000	Thallium	TI	ppm	0.5	t
Cesium Connort	Cs	ppm	0.01	10000	Thulium	Tm	ppm	0.01	t
Copper	Cu	ppm	5	10000	Uranium	U	ppm	0.05	t
Erbium	Er	ppm	0.03	1000	Vanadium	V	ppm	5	t
Europium	Eu	nnm	0.03	1000	Tungsten	W	ppm	1	t
Gallium	Ga	ppm	0.05	1000	Yttrium	Y	ppm	0.5	t
Gadolinium	Gd	ppm	0.05	1000	Ytterbium	Yb	ppm	0.03	t
			0.2	10000	Zinc*	Zn	ppm	5	t
Hafnium	Hf	ppm	0.2	100001					

Figure 18. Table of elements analyzed by ICP-MS (code ME-MS81).

In addition to ICP, Geomega Resources requested an X-Ray Fluorescence Spectroscopy (XRF) on each pulp. A finely ground sample powder (10 g minimum) is mixed with a few drops of liquid binder (Polyvinyl Alcohol) and then transferred into an aluminum cap. The sample is subsequently compressed under 30 ton/in<sup>2</sup> to form the pressed pellet. After pressing, the pellet is dried to remove the solvent and analyzed by WDXRF spectrometry for Nb. This method (ME-XRF05) provides a detection limit of 2ppm and an upper limit of 10,000ppm. This method was favoured to the ICP-MS as discussed in the following section.

The author and SGS Geostat are of the opinion that the data quality is acceptable and that the final drill hole database is adequate to support a NI-43-101 compliant mineral resource estimate.



# 12- Data Verification

Geomega had excellent QAQC protocols in place and SGS Geostat was able to show that the data is of sufficient quality to use for resource estimation. The only issue encountered was that the ICP-MS methodology used by ALS Minerals was consistently underestimating Nb in samples. This was discovered during the course of the 2011 winter drilling campaign, and a decision was taken to analyze Nb via XRF. This method appears to provide better results; unfortunately insufficient weight of standard material was sent to the lab for XRF during this campaign. This complicated the demonstration of accuracy for Nb via XRF.

# **12.1 Verification with Laboratory Certificates**

The data used for the interpolation corresponds to the values produced by ALS Minerals in 2010 and 2011. Values in the database were cross checked with data downloaded directly from ALS Minerals. A total of 32% (2200 of 6937) of available samples were verified against the certificate values. A single anomaly was identified related to Nb concentration used (ICP instead of XRF). The cause of this error was identified and corrected.

# 12.2 Blanks

Blanks were used to assess any contamination issues that would occur in the lab. The blank material was silica sand which contains an average of 32ppm Ce (not certified). The average value obtained during routine analyses of the blank returned 30ppm Ce from 142 analyses. Generally speaking the blank data is very constant (Figure 19). Blank Sample J139925 represents a significant anomaly that was investigated further. This blank was inserted within a mineralized interval and may represent contamination from previous samples (Figure 19 inset). This worst case still has little impact on the resource estimate: it has 0.05% TREO which is 1/20<sup>th</sup> of the base case cut-off grade. Inter-sample contamination during preparation and analyses is so low that it is not measurable for the most part; and in the worst example has no significant impact on the end results.



Figure 19. Blank values for the LREE and Nb in the order of analysis (values are not stacked). The inset graph is the sequence of analyses associated with anomalous Blank (J139925).

# 12.3 Check Sampling

Fifty-six independent samples were collected from quarter sawn core and analyzed by SGS analytical laboratories. Additionally, Geomega sent about 5.3% of the pulps to a separate independent laboratory (Actlabs) to verify the results obtained from the original analyses (ALS). The comparison between averages obtained from the original analysis (ALS) and the check labs are shown in Figure 20. Generally the check values correspond very closely with the values in the database. Ce, La and Nd appear to have slightly higher values in the original analyses than with the check samples at SGS. Values obtained from ActLabs as well as the HREE appear to be slightly lower values than the original samples.

To verify whether there is a systematic bias towards higher or lower values between the original analyses and the check samples a sign test was used (Figure 21). This test shows that Pr, Gd and Tb have slight to moderate biases toward higher values in the original dataset. Conversely Tm, Y, Yb and Lu have moderate to strong bias towards higher values within the check samples. The absolute differences appear to be very small if we look at Figure 20. To further investigate the apparent differences several scatter plots with 20% limits were constructed; six of these are shown in Figure 22. Overall, data plots close to the expected trend and mostly within the 20% limits. The sign test suggests a moderate bias for the Pr data, however the scatter diagrams suggests that the bias does not necessarily translate in significantly different values (Figure 20, Figure 21, Figure 22). The situation for the Lu is rather different in that most of the data falls outside the 20% range.

It should be noted here that the variographic analyses suggests a nugget effect around 50% (discussed further in the Resource Estimation Section). This effectively means that half the total variability inherent to the deposit can be accounted for by adjacent samples (e.g. other half of core sample).



Figure 20. Scatter plots showing the average values obtained from the 56 independent samples collected during the site visit. The green datapoint is the average value obtained by Geomega during the internal QAQC procedure where pulps were sent to the Actlabs. The plot on the right presents the same data except in LOG scale to highlight values at low concentrations.



Figure 21. Histogram showing results of a sign test. At 0.5 there is an equal amount of samples of one population greater than the other. The red lines show the limits of what can be explained by a limited sample set (i.e. elements plotting above the upper red line have a bias toward higher values within the original dataset).

The check sampling has shown that the concentrations reported by Geomega are valid; particularly of the main elements contributing to the value of the mineralization (Ce, Nd, La, Eu, Pr, Nb). Check sampling provides support for high concentration identified in the mineralization and cannot determine whether the values are accurately measured; this is why we use certified standards.





Figure 22. Scatter plots showing distribution of values obtained between original analyses (ALS) and those obtained from quarter split check samples (SGS).



#### 12.4 Standards

Geomega inserted three certified standards and 2 in-house standards. In general the values obtained from ALS compare favorably with the certified or assumed values. In cases where concentrations deviate from the accepted values, they almost invariably have concentrations below the accepted concentrations. The most useful standard for validation is the OREAS-146 standard which has a certified concentration of 1.44% TREO; this is very similar to the concentrations found within the mineralization at Montviel. The values measured by ALS compare favorably with the certified values for the most part. There is one negative anomaly (sample 10) which can be observed for each element and a positive anomaly (sample 48) which is observed only in La and Ce. The average values for all elements are below the certified values for this standard. In most cases the average measured values is below the certified 95% lower confidence limit (except Ce, Sm, Lu and Y). In a few cases the measured value only rarely plots within the confidence intervals (Gd, Er, Yb, Tb). It is clear from this analysis that values equal to, or slightly below the certified values; and that the data is suitable for use in a resource estimation.

A separate certified standard was used to assess the precision of Nb analyses (OKA-1 by Canmet). Unfortunately the method used by ALS Minerals by ICP consistently underestimated the Nb present in the sample (Figure 23). This was realized by Geomega during the course of the exploration campaign; subsequently all pulps were reanalysed by XRF. The amount of standard that was sent to ALS was insufficient to analyse by the XRF method and there are no values available that can be used to assess the precision of this method. Fortunately ALS Minerals uses the OKA-1 certified standard as part of their internal QAQC program and 2 values are available (0.369% and 0.368%) which are within the 95% confidence limit (0.37%  $\pm$  0.01%). The limited data available suggests that the XRF analyses for Nb completed by ALS Minerals provide data that is accurate enough to use to estimate resources.



Figure 23. Results of ICP by ALS on certified standard OKA-1. The bold line is the certified value and the dashed lines represent the limits of the 95% confidence interval.







Figure 24. Values obtained from analysing certified standard OREAS 146 in sequential order. Bold lines represent the accepted value and the dashed lines represent the certified 95% confidence interval.



# 13- Mineral Processing and Metallurgical Testing

This section was is the executive summary from a report prepared by SGS Canada for Geomega and dated September 9, 2011 "The mineralogical characteristics of seven composite samples from the Montviel REE Project". This report was contracted and completed independently from the current technical report.

## 13.1 Mineralogy and REE Distribution

- The bulk composition of the samples is dominated by carbonate minerals and less by silicates, sulphides and Fe-Ti-Oxides (Table 1).
- The main REE minerals are Ba-bearing phases and their composition is quantified with electron microprobe analyses; both are Ce-rich carbonates. They are identified as **huanghoite** [BaREE(CO<sub>3</sub>)<sub>2</sub>F] and/or **cebaite** [Ba<sub>3</sub>Ce<sub>2</sub>(CO<sub>3</sub>)<sub>5</sub>F<sub>2</sub>], followed by minor subordinate **qaqarssukite** [Ba(Ce,REE)(CO<sub>3</sub>)<sub>2</sub>F] and a **BaSrNaREE** phase. **Pyrochlore** [(Na,Ca)<sub>2</sub>Nb<sub>2</sub>O<sub>6</sub>(OH,F)] and **monazite** [(Ce,La,Nd,Th)PO<sub>4</sub>] are present in varied amounts in the samples. Rare **fergusonite** (YNbO<sub>4</sub>) is also observed and is grouped under other REE due to its scarcity.
- REE mineralization is controlled by the Ba-REE carbonates.
- Nb and partially Y are controlled by pyrochlore.
- Monazite is below 0.5% in all samples except in the *DDH 10-03 RE with high phosphate* that also carries the highest apatite grade. Note that apatite is also present as a minor to moderate phase in the *RE with Ba,Sr,Th* and *Low Grade RE* samples.
- DDH 10-01 at depth is poorly mineralized.
- The silicate content is generally low (<11%) in all samples.
- A moderate content (~12%) of ilmenite is recorded in the *High Grade RE* sample.

Mineral/Sample	DDH 10-03 RE with high phosphate	DDH 10-03 High grade RE with Nb	DDH 10-03 RE with high Ba	DDH 10-03 Low Grade RE	DDH 10-01 RE with Ba,Sr,Th	DDH 10-01 High Grade RE	DDH 10-01 at depth
Ba-REE Carbonates	0.5	5.0	3.0	0.9	4.2	7.4	0.6
Monazite	2.5	0.2	0.3	0.3	0.2	0.5	0.0
Pyrochlore	0.3	1.6	0.8	0.5	0.1	1.0	0.6
Other REE	0.0	0.1	0.0	0.0	0.0	0.2	0.0
REE/Pyrochlore	3.3	6.8	4.1	1.7	4.6	9.2	1.1
Apatite	26.8	0.1	0.3	8.7	2.9	0.3	0.0
Silicates	4.5	6.5	11.0	8.9	4.2	6.9	6.1
Ba-Ca-Sr-Mg Carbonates	63.3	84.9	83.3	79.3	87.3	71.0	92.4
Sulphides	1.2	1.5	1.0	1.0	0.8	0.8	0.2
Fe-Ti-Oxides	0.9	0.2	0.3	0.3	0.2	11.7	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 8. Summary of Modal Mineralogy

#### • DDH 10-03 RE with high phosphate

- i. This sample is distinct from the others for its highest apatite (27%) and monazite grade (2.5%).
- ii. Monazite carries most of the Ce (88%), La (91%), Nd (84%), Pr (94%) and Th (~87%).
- iii. Pyrochlore carries essentially all the Nb, and most of the Y (72%), followed by fergusonite (22%).

## • DDH 10-03 High grade RE with Nb

- i. Good mineralization (6.8% total REE-Nb minerals).
- ii. The Ba-REE carbonates carry most of the Ce (89%), La (92%), Nd (90%), Pr (88%), Th (95%), and 43% of the Y. Pyrochlore carries essentially all the Nb, and 57% of the Y.

#### • DDH 10-03 RE with high Ba

- i. The sample is characterized by good REE-Nb mineralization (4.1%). Ba-REE carbonates carry most of the Ce (~76%) La (83%), Nd (79%), Pr (76%), Th (87%), and Y (50%). The bulk of the remaining REE is accounted by monazite.
- ii. Pyrochlore carries essentially all the Nb, and 49% of the Y.

## • DDH 10-03 Low Grade RE

- i. The sample is characterized by poor REE-Nb mineralization (1.7%).
- ii. Ba-REE carbonates carry approximately half of Ce (48%), La (58%), Nd (46%), Pr (47%) and Th (63%), followed by monazite ~44%, 40%, 41%, 51% and 37%, respectively.
- iii. Pyrochlore carries all the Nb. Pyrochlore also carries most of the Y (63%), followed by Ba-Ce carbonates (37%).

## • DDH 10-01 RE with Ba,Sr,Th

- i. The sample is characterized by good REE-Nb mineralization (4.6%).
- ii. Ba-Ce carbonates carry most of the Ce (84%), La (89%), Nd (85%), Pr (84%), and Th (93%). The remaining bulk of the REE is carried by monazite.
- iii. Pyrochlore carries the entire Nb content, and most of Y at 66%, while the remainder 34% is accounted by Ba-REE carbonates.

## • DDH 10-01 High Grade RE

- i. The sample is characterized by the best REE-Nb mineralization (9.2%).
- ii. Ba-REE carbonates carries most of the Ce (79%), La (83%), Nd (78%), Pr (75%), Th (91%), followed by monazite 15%, 12%, 14.3%, 17% and 9%, respectively.
- iii. Pyrochlore carries most of the Nb (99.9%), and ~44% of Y, while Ba-REE carbonates carry ~51% Y.

#### • DDH 10-01 at Depth

- i. The sample is poorly mineralized (1.1% total REE-Nb minerals).
- ii. Ba-REE carbonates carry most of the Ce (96%), La (95%), Nd (95%), Pr (94%), Y (98%), and Th (98%).
- Minor sulphides (>0.8%) are present in all samples except for DDH 10-01 at depth. The bulk of the sulphides is sphalerite [(Zn,Fe)S].

## **13.2 Mineral Chemistry**

- Huanghoite/cebaite contain (in average values) Ce 11.07 wt%, La 6.08 wt%, Nd 3.64 wt%, Pr 1.04 wt%, Sm 0.28 wt%, and Th 0.55 wt%.
- **Qaqarssukite** contains Ce 16.45 wt%, La 9.93 wt%, Nd 5.44 wt%, Pr 1.46 wt%, Gd 1.14 wt%, Sm 0.30 wt%, and Th 0.16 wt%.
- The **BaSrNaREE** average 5.89 wt% Ce, 3.43 wt% La, 0.59 wt% Pr, 0.15 wt % Eu, 2.18 wt% Nd, 1.17 Th, and 0.17 wt% Sm.
- **Barytocalcite** contains 0.16 wt% Ce.
- **Pyrochlore** averages 46.54 wt% Nb, 0.27 wt% Ce and 0.11 wt% La.
- Apatite averages of 0.25 wt% Ce and 0.23 wt% Nd.
- Monazite averages 13.70 wt% La, 30.56 wt% Ce, 3.17 wt% Pr, 0.83 wt% Th, 0.32 wt% Sm and 9.26 wt% Nd.

# 13.3 Grain Size

• For a  $K_{80}$  of 212 µm, the  $d_{50}$  (mid point in the size distribution) (Table 9) shows that monazite is generally fine-grained (<20 µm), Ba-REE carbonates >34 µm, pyrochlore varies widely but >13 µm, and apatite >32 µm. The Particle (representing mono-mineralic and poly-mineralic particles) is > 52 µm.

Mineral/Sample	DDH 10-03 RE with high phosphate	DDH 10-03 High grade RE with Nb	DDH 10-03 RE with high Ba	DDH 10-03 Low Grade RE	DDH 10-01 RE with Ba,Sr,Th	DDH 10-01 High Grade RE	DDH 10-01 at depth
Ba-REE Carbonates	43	48	34	42	35	61	29
Monazite	11	12	10	12	11	19	10
Pyrochlore	22	13	34	32	52	15	25
Apatite	32	48	34	43	30	70	100
Particle	70	61	70	52	97	82	82

Table 9. The  $d_{50}$  (mid point in the size distribution in  $\mu m$ )

#### **13.4 Liberation and Association**

For a  $K_{80}$  of 212 µm the liberation of Ba-REE carbonates is poor to moderate and ranges from 30% to 61%, that of monazite from nil to 55%, that of pyrochlore from 20% to 75%, and that of apatite from 10% to 87% (Table 10). A finer grind is expected to improve liberation.

	DDH 10-03 RE	DDH 10-03					
Mineral/Sample	with high	High grade RE	DDH 10-03 RE	DDH 10-03 Low	DDH 10-01 RE	DDH 10-01	DDH 10-01 at
	phosphate	with Nb	with high Ba	Grade RE	with Ba,Sr,Th	High Grade RE	depth
Ba-REE Carbonates	61%	47%	42%	56%	49%	37%	30%
Monazite	55%	~10%	<1%	6%	6%	2%	nil
Pyrochlore	27%	75%	59%	74%	20%	54%	55%
Apatite	43%	10%	11%	46%	31%	19%	87%

Table 10. Liberation of REE-bearing Minerals

#### 13.5 Grade and Recovery

- The following grade-recovery calculations are based on the **REE minerals** (Ba-REE carbonates and Monazite) grade and indicate for:
  - i. *DDH 10-03 RE with high phosphate*: grades of between 94% and 62% for REE minerals recoveries of 49% to 96%, respectively.
  - ii. *DDH 10-01 at depth* sample shows grades of between 97% and 68% for REE minerals recoveries of 44% to 73%, respectively.
  - iii. For the rest of the samples grades of between 96% and 61% for REE minerals for recoveries of 44% to 86%, respectively are projected.
- The following grade-recovery calculations for pyrochlore indicate for:
  - i. *DDH 10-03 RE with high phosphate*: grades of between 98% and 74% for pyrochlore recoveries of 29% to 50%, respectively.
  - ii. *DDH 10-01 at depth*: grades of between 98% and 78% for pyrochlore recoveries of 55% to 75%, respectively.
  - iii. For the rest of the samples: grades of between 99% and 61% for pyrochlore recoveries of 55% to 89%, respectively are projected, with the exception of *DDH 10-01 RE with Ba,Sr,Th* that has a very low pyrochlore content and data might be statistically poor.
- The following grade-recovery calculations for apatite indicate for:
  - i. *DDH 10-03 RE with high phosphate*: grades of between 91% and 55% for apatite recoveries of 43% to 97%, respectively.
  - ii. *DDH 10-03 Low Grade RE*: grades of between 95% and 60% for apatite recoveries of 46% to 77%, respectively.
  - iii. *DDH 10-01 RE with Ba,St,Th*: grades of between 92% and 68% for apatite recoveries of 31% to 64%, respectively.



#### 13.6 Mineralogy Conclusions and Recommendations

- The samples are variably mineralized (as shown by the % of REE minerals). However, they are homogeneous in bulk composition, with the exception of an apatite rich sample. Ba-REE carbonates, and less monazite, carry most of the REE in the samples. Nb is almost exclusively hosted by pyrochlore. Y is accounted by ca. equal amounts of Ba-REE carbonates and pyrochlore. Both the Ba-REE carbonates and monazite should be correcovered for maximum REE grades.
- Note that minor amounts of mainly Ce and Nd are carried by apatite and barytocalcite and may account for small REE losses because they would be rejected.
- The liberation of the main REE phases is poor to moderate for the  $K_{80}$  of 212 µm used for this study. Most of the free and liberated Ba-REE carbonates occur below 125 µm. Monazite is generally fine-grained, and most of the liberated mass occurs below 50 µm and often below 20 µm. Therefore, processing of the samples will result in moderate grades and recoveries at  $K_{80}$  of 212 µm. Instead grinding at a  $K_{80}$  of 100 µm is suggested.
- A mass balance calculation can be performed in order to calculate a desirable feed material (excluding the apatite rich sample) for metallurgical purposes if the blending proportions are fixed.
- The high phosphate sample might be treated separately. The DDH 10-03 Low Grade RE sample is similar to DDH 10-01 at depth, and blending with the higher grade samples might dilute the grade of the REE. Therefore, caution is advised on how a feed sample might be composed.
- The specific gravity (SG) of monazite is 5.3 g/cm<sup>3</sup>, Ba-REE carbonates 4.8 and pyrochlore 5.2. The SG of ankerite is 3.2, siderite 3.9 and dolomite 2.8. Therefore, pre-concentration either by gravity or flotation should be conducted prior to any attempts to recover the REE.
- Leaching of the feed samples is strongly not recommended due to the high content of the carbonates that would result in high acid consumption. However, some tests parallel to the pre concentration of the REE minerals might be worth exploring.

# 14- Mineral Resource Estimates

## 14.1 Mineral Resource Statement

Mineral resources for the Montviel Core Zone were estimated by using a 1% TREO cut-off grade. At this base case cut-off, the Montviel Zone hosts an Indicated Resource of 183.9 million tonnes grading 1.45% TREO and an additional Inferred Resource of 66.7 million tonnes grading 1.46% TREO. The mineral resource estimates for TREO cut-offs of 0.85%, 1.0% (base case), 1.25% and 1.5% are outlined in the table below. Results are presented as in-situ. There are no known factors or issues related to permitting, legal, mineral title, taxation, socioeconomic or political relations that could materially affect the mineral resource estimate. Potential modifying factors regarding marketing are discussed in the Cut-Off Grade section below.

Table 11. Resource summary table. The 1% cut-off grade is considered the base case (bold).

Cut-off Grade TREO (%)	Resource Category	Tonnes	Average Bulk Denisty (t/m³)	TREO (%)	LREO (%)	IREO (%)	HREO (%)	Y2O3 (%)	Nb2O5 (%)
0.85	Indicated	196,200,000	2.91	1.420	1.372	0.037	0.004	0.007	0.123
1.00	Indicated	183,900,000	2.92	1.453	1.404	0.037	0.004	0.007	0.126
1.25	Indicated	136,000,000	2.92	1.562	1.511	0.039	0.004	0.007	0.135
1.50	Indicated	69,200,000	2.92	1.744	1.688	0.043	0.005	0.008	0.158

Cut-off Grade TREO (%)	Resource Category	Tonnes	Average Bulk Denisty (t/m³)	TREO (%)	LREO (%)	IREO (%)	HREO (%)	Y2O3 (%)	Nb2O5 (%)
0.85	Inferred	72,600,000	2.89	1.417	1.366	0.038	0.005	0.008	0.136
1.00	Inferred	66,700,000	2.89	1.460	1.408	0.039	0.005	0.008	0.140
1.25	Inferred	48,100,000	2.88	1.587	1.533	0.041	0.005	0.008	0.153
1.50	Inferred	26,800,000	2.87	1.755	1.696	0.045	0.005	0.008	0.177

Notes:

- Effective date September 29, 2011.
- Total Rare Earth Oxides (TREO) include: La2O3, Ce2O3, Pr2O3, Nd2O3, Sm2O3, Eu2O3, Gd2O3, Tb2O3, Dy2O3, Ho2O3, Er2O3, Tm2O3, Yb2O3, Lu2O3, Y2O3.
- Light Rare Earth Oxides (LREO) include: La2O3, Ce2O3, Pr2O3 and Nd2O3.
- Intermediate Rare Earth Oxides (IREO) include: Sm2O3, Eu2O3 and Gd2O3.
- Heavy Rare Earth Oxides (HREO) include: Tb2O3, Dy2O3, Ho2O3, Er2O3, Tm2O3, Yb2O3 and Lu2O3.

Table 12. Detailed breakdown of the resource estimate at the 1% TREO cut-off.

Cut-off Grade TREO (%)	Resource Category	Tonnes	La2O3 (%)	Ce2O3 (%)	Pr2O3 (%)	Nd2O3 (%)	Sm2O3 (%)	Eu2O3 (%)	Gd2O3 (%)	Tb2O3 (%)	Dy2O3 (%)	Ho2O3 (%)	Er2O3 (%)	Tm2O3 (%)	Yb2O3 (%)	Lu2O3 (%)	Y2O3 (%)	Nb2O5 (%)
1.00	Indicated	183,900,000	0.3696	0.7163	0.0755	0.2425	0.0246	0.0047	0.0082	0.0007	0.0023	0.0003	0.0005	0.0001	0.0003	0.0000	0.0072	0.1257
1.00	Inferred	66,700,000	0.3785	0.7142	0.0751	0.2404	0.0255	0.0049	0.0086	0.0007	0.0025	0.0003	0.0006	0.0001	0.0004	0.0001	0.0078	0.1403



## 14.2 Block Model

The mineral resources were estimated using analytical results from 19 diamond drill holes totaling 8,856 meters completed by Geomega at the Montviel Zone in 2010 and 2011 (prior to June 30<sup>th</sup>). The mineral resource estimate was completed using three-dimensional wireframe modeling of geological contacts followed by block model interpolation methodology. The geological wireframe outlined the contact between silicocarbonatite and either calciocarbonatite or ferrocarbonatite; thus eliminating the silicocarbonatite from the resource estimation. Although a few examples of REE-enriched silicocarbonatite can be found at Montviel it is felt that this contact presents a sharp and geologically reasonable limit to the resources.

The block model was defined by blocks measuring 10 metres long by 10 metres wide by 10 metres thick. The blocks were confined to the wireframe described above as well as a surface defining the base of overburden. The base of overburden was defined by a wireframe joining the base of drill hole casings across the Montviel area. A total of 98,054 blocks had grades and density interpolated.

	Х	Y	Ζ
Dimension	10m	10m	10m
Discretization	2	2	2
Starting Coordinate	389500mE	5519900mN	-400m elevation
Ending Coordinate	390500mE	5520900mN	+300m elevation

Table 13. Block model parameters.



Figure 25. Orthogonal image within SectCad within a 250 wide slice showing the surfaces used to limit the resources. Drill holes are shown with the wide bar showing the mineralized intervals and the lithology at the center; note the green and grey units protruding at the right (silicocarbonatite).





Figure 26. Cross section near the center of the block model (4W) illustrating the apparent layering that is characteristic of the Montviel Core Zone.

# 14.3 Phosphate Enriched Zone

An Apatite-rich zone is present in the upper central portion of the REE mineralization. This zone was wireframed based on geological contacts and contains an estimated 12.3 million tonnes at 5.2% P<sub>2</sub>O<sub>5</sub> and 1.29% TREO. This estimate is based solely on the 1% TREO cut-off grade and limited by the P<sub>2</sub>O<sub>5</sub> geological wireframe (Figure 27). This mineralization is included in, and is already accounted for in the indicated resources from Table 12. The phosphate enriched zone was actually modeled as 2 separate lenses that dip parallel to the lithological and REE grade stratigraphy observed lower in the intrusion (Figure 28).

A separate  $P_2O_5$  resource could have been estimated; however the current value of the  $P_2O_5$  is far outweighed by the REEs. It was therefore decided with Geomega to treat the  $P_2O_5$  as a byproduct for this study.

The single sample analyzed mineralogically suggested that the main REE bearing mineral within this unit is Monazite. Further mineralogical and metallurgical tests should be conducted on this zone to see how this would impact the metallurgical performance of this rock-type.



Figure 27. Plan map showing the position of the phosphate-enriched zone in green. This zone outcrops at surface and is variably enriched in REE.



Figure 28. Section 5W showing the  $P_2O_5$  distribution. The green wireframes were drawn to outline the phosphateenriched zone. Only a portion of the phosphate zones shown here was retained in the resource statement due to a TREO based cut-off.

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#### 14.4 Interpolation Methodology

The grades of all the REE, Nb and  $P_2O_5$  were interpolated by using the ordinary kriging method. Three separate variographic analyses and kriging parameters were used for the interpolation (TREO, Nb, and  $P_2O_5$ ). The mineral resources were estimated using SectCad software. Assay lengths averaged 1.33m with a range of 0.35m to 2.25m. To ensure grade representativity, reduce local noise yet retain the inherent variability, composites were created at 2m intervals which were limited to the mineralized intervals. Only drilling from the December 2010 to June 2011 was used for the resource estimation; even though sparse and shallow historic drilling is present in around the Montviel Core Zone. Drill density and data quality was sufficient from the recent campaign and prevailed over the added complication and potential pitfalls of using multiple generations of drilling and assay data.

The distribution of the composite grades are symmetrical and do not show a strong skewness (Figure 29). The maximum value of 6.9% TREO is far less than 10 times the average composite value of 1.38% TREO; therefore no capping was applied to the composites.

#### Three successively larger search ellipses were used for the interpolation (

Table 14, Figure 30). Blocks that were interpolated from an earlier pass were not re-interpolated. Ordinary kriging was used to interpolate the grade within each block. Each block was discretized by 2 in each dimension; which means that for each block, 8 separate calculations were made (one in each octant) then averaged for the block itself. Each interpolation had a set minimum of 6 and a maximum of 20 composite values. A maximum of 5 composites from a single drill hole was imposed to ensure that data was used from at least 2 drill holes.

The bulk density was interpolated (inverse distance squared) from 308 evenly distributed specific gravity measurements taken from wrapped core samples. The average value for the samples was  $2.92t/m^3$ , and the interpolated average for the deposit was  $2.91t/m^3$ . This value at first glance seems rather high; for example published density values for limestone are between  $2.3t/m^3$  and  $2.7t/m^3$ . A compilation of the geochemistry within the Montviel Carbonatite shows that it actually contains more Fe than Ca (22% vs. 17%) and has significant concentrations in other heavy elements such as BaO (2.4%), MnO (2.1%) and TREO (1.3% uncut). The density values were also verified independently by SGS.



Figure 29. Histogram of TREO from composites within the mineralized envelope.

Table 14. Parameters	of the	search	ellipses	used	for the	e interpolation.
1 0000 1 1. 1 00000000	0 1150	50001015	unpsus	115001	101 1150	, interpolation.

Ellipse	Yaw	Pitch (Dip)	Roll (Spin)	Major Axis	Intermediate	Minor Axis
_	(azimuth)				Axis	
First Pass	130°	-30°	0	50m	50m	25m
Second Pass	130°	-30°	0	100m	100m	50m
Third Pass	130°	-30°	0	150m	150m	75m



Figure 30. Plan view of the block model showing the three search ellipses. Red: first pass; Orange: second pass; Blue: third pass.



## 14.5 Variography

Three separate variographic analyses and kriging parameters were used for the interpolation (TREO, Nb, and  $P_2O_5$ ). The variograms used to establish the model curves are shown in Figure 31, Figure 32 and Figure 33. Composites within the mineralized wireframe were used to for the variographic analysis. Outlier data for TREO were removed from the variographic analysis to obtain a clearer trend (less than 0.1% of total data). The spatial variability of Nb and TREO are very similar with modeled nugget effects of 0.5 and 0.45 respectively and a range of 150m. This nugget value effectively means that half the total variability inherent to the mineralization can be accounted for by adjacent samples. The range of 150m means that pairs of samples with spacing greater than 150m are not more similar to each other than any other sample within the dataset.  $P_2O_5$  is more spatially consistent with a modeled nugget effect of 0.1 and a range of 250m.

Several other geometries of variance were analyzed to attempt to attain a lower geometrical variance without success. This included a search at azimuth of 130° and dip of -33° which is the apparent trend of high grade layers within the Montviel Core Zone. Probably due to a limited number of pairs this did not result in a lower nugget or wider range.



Figure 31. Variogram for TREO. Inset is the parameters used in for the kriging based on the variance model.





Figure 32. Variogram for Nb. Inset is the parameters used in for the kriging based on the variance model.



Figure 33. Variogram for P<sub>2</sub>O<sub>5</sub>. Inset is the parameters used in for the kriging based on the variance model.



### 14.6 Cut-Off Grade

A cut-off grade was established by SGS Geostat by using a conceptual economic model based on an estimated operating cost compiled from recent economic studies of other REE projects. A significant buffer was then added to account for the uncertainty related to future value of saleable products from the Montviel Core Zone. Due to wide shallow extent of the mineralization an open-pit mining scenario was chosen. The total estimated processing cost was of 120 US\$/tonne; plus a mining cost of 5 US\$/tonnes. At the time of the resources estimation process the US\$ and CAD were near parity.

A compilation of REE prices in US\$ was completed to establish a 3 year trailing average (August 2008 to August 2011) (Table 15).

	3 year Trailing Average	
Element	US\$/kg (Aug 2008-Aug 2011)	
La2O3	37	\$
CeO2	37	\$
Pr2O3	68	\$
Nd2O3	93	\$
Sm2O3	39	\$
Eu2O3	1,187	\$
Gd2O3	25	\$
Tb2O3	1,056	\$
Dy2O3	467	\$
Ho2O3	109	\$
Er2O3	81	\$
Tm2O3	97	\$
Yb2O3	33	\$
Lu2O3	544	\$
Y2O3	64	\$
Nb2O5	34	\$

Table 15. Three-year trailing average of REE and Nb prices.

LREE and IREE prices were obtained from www.asianmetal.com.

Prices for the HREE were from www.asianmetals.com for 2011 and Preliminary Economic Assessment by Quest Resources (2010) for years where the prices are not listed.

Nb prices were taken from the Iamgold website.

REE prices attained all time highs in 2011, and there remains significant uncertainty regarding the future pricing. Given the prices listed in Table 15 and the relative concentration of the elements in the estimated resources it is possible to show the relative value of each elements within the resource. The overall economic viability and recovery are <u>not</u> considered in this analysis (Figure 34). This chart illustrates that the conceptual primary source of revenue (given the pricing assumption) would be from Ce, Nd, La, Eu, Pr, and Nb.

A cut-off based on a "metal equivalent" or a "Net Output Revenue" was considered at first. The drawback of this approach is that there is a more direct link to the price of the commodities which are poorly constrained and volatile compared to most other mining products due to the limited number of buyers and sellers. To ensure that the resource estimate was more transparent and stood the test of time it was decided to use a TREO cut-off grade; which is the current industry standard.



The obvious drawback of this approach is that elements that may not have an economic impact on the deposit are included in the cut-off value (for the current prices). It should be noted that, 96% of the apparent potential value of the mineralization is within Ce, Nd, La, Eu, Pr, and Nb. These elements (excluding Nb) comprise 97% of the concentration of the TREO grade at a 1% cut-off. This means that the REE with little apparent value to the deposit (Dy, Sm, Tb, Y, Er, Gd, Tm, Yb, Ho, Lu) increase the TREO values by only 3%.

The TREO concentration necessary to pay for the conceptual operating cost 120\$/t and assuming a 75% recovery of REE is 0.3% TREO. The recovery was assumed based on the favourable grain size distribution of the REE minerals and the simple approach necessary to get these minerals in solution. No data from metallurgical tests on the Montviel Core Zone are available at the writing of this report. The operating costs were estimated based on economic studies conducted recently on similar REE deposits. The actual cost of refining and extracting each element into saleable products is poorly constrained at the moment due to the overwhelming dominance and secrecy of Chinese producers for processing these elements.

Due to the high uncertainty related to current and future REE prices and potential operating costs it was decided with Geomega to use a more robust cut-off grade of 1% TREO.



Figure 34. Pie chart showing the relative contribution to the overall "value" of the Montviel Core Zone. The overall economic viability and recovery are not considered in this analysis.



To test for the prospect of economic extraction an optimized mining scenario was constructed with GEMS Whittle software. The model assumed 45° pit slope, 75% TREO recovery, and 60% Nb recovery. Of the 98,054 blocks that were interpolated only 12 fell outside of the "Base Case" pit shell; of which only one was above the 1% TREO cut-off grade.

# 14.7 Resource Categories

An assessment of the grade continuity was undertaken to establish the drill spacing necessary to attain an indicated or inferred level of confidence. The range of 150m observed for TREO and Nb provides some evidence that drill spacing provides meaningful information about the grade in the intervening distance (Figure 31, Figure 32). The average intersection width of 369.5m within 18 drill holes spaced 60-200m apart in the Montviel Core Zone significantly increases the confidence that any drilling amongst this group will not intersect significantly dissimilar mineralization. The absence of any drill sections with unusually low grade within this group of drill holes also lends confidence to the geological and grade continuity.

Blocks were tagged with the help 2 separate search ellipses, corresponding with the second pass and third pass (Table 14). For example, blocks that encountered 2 separate holes within the "second pass" search ellipse (radius of 100m) were tagged as "indicated". This means that a drill grid spacing tighter than 100m is necessary to attain an indicated category of resources. For inferred resources a drill grid spacing of 150m is necessary to attain an inferred resource category (third pass search ellipse). Several minor geometrical aberrations comprising less than 3% of the total indicated blocks, such as "pant-legs" and "islands" of inferred within the indicated resources were observed when validating the categorization. A wireframe was created around the indicated blocks and acceptable geometrical aberrations to retag them and create a contiguous volume of indicated resources.

## 14.7 Validation of Resource Estimate

The grade for the mineral resources underwent a rigorous verification process. All of the modeling steps and decisions on parameters to be used were reviewed by another Qualified Person within SGS Geostat. To validate the grade distribution, a thorough section by section visual comparison was undertaken to compare the color coded block values versus the composites data in the vicinity of the interpolated blocks. Additionally, the grade average and standard deviation parameters for the composite data and the block model data were compared. Table 16 summarizes the comparative statistics of the composite and block model datasets without any applied cutoff grade. The slightly higher grade within the Blocks in Table 16 is due to high grade zones (SW and deep) occurring near the edges of the model and therefore causing a slightly higher grade within extrapolated blocks. This result was expected and verified. The lower overall standard deviation is a function of the relative "sample size" between a block and composite. This is the expected result of any interpolation process where you are estimating the value within a volume (block) that is greater than the volume of the samples (composites) you are using for the estimation.

	Average Value (% TREO)	Standard Deviation	Count
Blocks	1.38%	0.34%	98,054
Composites	1.35%	0.63%	3,333

Table 16. Comparison of data from interpolated blocks (no cut-off grade) and composites used to interpolate them.

The tonnage was validated by comparing the wireframe around the interpolated blocks (135,456,204m<sup>3</sup>) and the sum of volumes of blocks before cut-off grade applied is (134,708,170m<sup>3</sup>) for a net difference of 0.55% between the two datasets. This small difference is accounted for by the individual blocks at the contact of the block model with the overburden which are estimated by using a block fraction function. The resources for the Montviel Core Zone were also estimated independently with inverse distance squared method which resulted in a near identical result in terms of grade and tonnage.

# **15- Adjacent Properties**

The Montviel Property is completely surrounded by claims and contains four gaps. The four gaps as well as a block to the east were staked by Zimtu Capital Corp. and Glenn Griesbach. These claims were then optioned in January 2011 by Canada Rare Earths Inc. Carbonatite has been identified on these claims from historic and new drilling; however assay results are not currently available to show whether it contains anomalous REE or Nb values (Figure 35). Presumably the carbonatite unit at the western limit of the property came from a separate pulse of magma from the proposed subchamber (described in the geology sections). It is not possible to foretell whether this unit will be enriched in REE. No historic showings or deposits are documented on these properties.



Figure 35. Maps of adjacent properties. A. Property map showing the disposition of the Canada Rare Earths Inc. property with respect to the geology and the Geomega property. Figure taken from <u>www.canadarareearths.com</u>. B. Map showing claim information from <u>www.gestim.com</u>. Niogold claims are optioned by Geomega and Zimtu, and Griesbach were optioned by Canada Rare Earths inc.

Although other claims are adjacent to the Geomega property, they do not appear to be of significance due to the geological constraints of the mineralization in question.



# **16- Other Relevant Data and Information**

The authors are aware that drilling is ongoing and metallurgical testing have been submitted. Results from these activities were not available at the moment of preparation of this report. No other relevant data or information is necessary to clarify the Montviel Property or this report.



# **17- Interpretation and Conclusions**

SGS Geostat validated the exploration processes and drill core sampling procedures used by Geomega as part of an independent verification program. This included a visit of the Montviel Property in June of 2011. This report only covers results obtained from work completed prior to June 30<sup>th</sup> 2011. SGS Geostat concluded that the drill core handling, logging and sampling protocols are according to conventional industry standards and conform to generally accepted best practices. The authors are confident that the protocols and methodology used by Geomega is appropriate and data produced thereof is suitable for the estimation of a NI 43-101 compliant mineral resource.

Geomega successfully discovered and outlined the Montviel Core Zone in a very short period since acquiring the property in late 2010. The mineralization is hosted primarily within Ba-rich fluoro-carbonate minerals within Calciocarbonatite and Ferrocarbonatite units at the core of the Montviel Alkaline Intrusion. It is quite unusual to define such a significant resource with a single drill campaign (Table 17). As can be observed within Figure 26 and Figure 30, some portions of the zone are more enriched than others. The grade is interpreted to be higher near the outer contact with the silicocarbonatite. This can be observed as an increase in grade with depth in the drill holes as well as a higher grade zone to the west (Figure 27, Figure 30). This western enrichment is exemplified by drill hole MVL-11-18 which intersected 250.65m of 2.15% TREO and 0.32% Nb. The Phosphate-Rich zone is near surface and comprises 12.3 million tonnes at  $5.2\% P_2O_5$  and 1.29% TREO. This estimate is based solely on the 1% TREO cut-off grade and limited by the  $P_2O_5$  geological wireframe. This mineralization is included in, and is already accounted for in the indicated resources from Table 17.

Resource Category	Cut-off Grade TREO (%)	Weighted average of Density (t/m <sup>3</sup> )	Tonnes	TREO (%)	Y2O3 (%)	Nb2O5 (%)
Indicated	1.00	2.91	183,900,000	1.453	0.007	0.126
Inferred	1.00	2.91	66,700,000	1.460	0.008	0.140

Table 17. Final resource summary.

Time is of essence for this project; particularly due to the relatively large number of REE projects that are at various stages of exploration and development. Although REEs are currently in short supply and prices have recently reached historic highs; in the medium term this situation has the potential of causing oversupply and devaluation of REEs as a whole. The Montviel Core Zone has the advantage of containing significant concentrations of Nb and P that have more stable prices and could buffer any significant drops in REE prices. Additionally, the mineralogy completed to date on the Montviel Core Zone suggests that it could have a favorable metallurgical properties compared to some of its peers.



# **18- Recommendations**

SGS Géostat considers that the potential to expand the resources for the Montviel Core Zone is excellent. The authors recommend that Geomega work aggressively towards illustrating the economic viability of the deposit through a Preliminary Economic Assessment. A summary of the proposed work, including a preliminary budget is shown in Table 18.

Metallurgical samples have already been sent for analyses to better understand the potential recoveries that could be obtained from this deposit. The metallurgical performance of the ore represents a significant risk factor for any REE deposit. A preliminary hydrogeological study should be undertaken to assess any potential issues relating to hydraulic head and rock permeability. The metallurgical and hydrogeological themes are particularly important for the recommended Preliminary Economic Assessment.

It is strongly recommended that Geomega follow up the western part of the Montviel Core Zone; more specifically on section 6W (Figure 36A). This section was crossed at an oblique angle by drill hole MVL-11-18, which resulted in the highest grade intersection within the mineral deposit. Better definition of the mineralization in this sector should permit modeling of this zone separately and further enhance the overall economic prospectivity of the project. Additionally, metallurgical tests should be undertaken on this zone in particular because it is likely to be the first zone to be mined in any conceptual plan.

Drilling should be conducted north of the polygenetic breccias to test whether the higher grade mineralization that we see at depth continues past this feature (Figure 36B, Figure 37). Limited drilling has been completed across this contact to date and shallow high-grade ore could significantly increase the economic potential of the Montviel Core Zone.

Exploration should still be considered as early stage within a rare and unusual intrusion. Zones enriched in other elements could be encountered which may enhance the value of the property. Elements such as P, Ti, V, Ba, Mn, Pt, Pd are known to be present in economic concentrations in other alkaline intrusions and any zones enriched in these elements should be investigated for their potential impact on the economics of the Montviel Core Zone. An assessment of the potential for PGE mineralization (Pt, Pd followed by Rh, Ru, Os, Ir) should be undertaken because sulphide bearing carbonatites are very rare and have produced economic concentrations of these elements. A limited number of pulps selected from separate sulphide bearing zones could be sent to analyze for these elements. It is very important to stay focused on the principle elements of interest; however at this stage of the project it is just as important to identify all potential opportunities.

Sampling of the soil above the Montviel carbonatite should be undertaken to test for enrichment in  $P_2O_5$  and Nb. The wide area and relative thickness of overburden means that a significant tonnage of material could be obtained from this layer. Five drill holes specifically designed to samples the soils should suffice to show the viability of this material to host economic concentrations Nb and or  $P_2O_5$ . It is altogether possible that the overburden material is composed solely of glacial sediments, in which case further investigation is not recommended.

A market study should be undertaken to ensure that the full value of the Montviel Core Zone is optimized. The future value of the REE is poorly constrained and a clearer view of the potential value of these as well as any other elements of value should be properly evaluated.

The certified standard OKA-1 should be redistributed so that sufficient material is present to be analyzed via the XRF method.

Following the completion of the current drill campaign Geomega should review the 3D geological model to take into account the new information. Subsequently, a thorough review of the geophysical data should be undertaken to create a new regional map that should help identify other exploration opportunities. A few drill holes should be reserved to test other sectors within the carbonatite; it is still unknown whether the Montviel Core Zone is the most prospective sector within the intrusion (Figure 38). A review of the geophysical signature paired with a compilation of the soil geochemistry (MMI) should be used in the target selection process.

Geomega has made great efforts to involve the local communities in the ongoing work on the Montviel Property. In October 2011 they announced a pre-development agreement with the Grand Council of Crees and the Cree First Nation of Waswanipi. Continued transparency, good faith and participation of local stakeholders will help ensure a smoother transition to any potential mine development stage for the Montviel Project.

Type of Work	Details	Estim	ated Cost
2011 Drill campaign	10,000m @ 200\$/m	\$	2,000,000
Soil Sampling Survey	Drilling of Overburden and MMI for exploration	\$	400,000
Geological Reinterpretation	Reanalysis of geophysics to produce a new regional map	\$	50,000
Other Exploration Costs	Camp, Logisistic, Salaries, Administration, Analyses	\$	2,000,000
Metallurgical Tests	Test the performance of high-grade and typical mineralization	\$	300,000
Environmental Baseline		\$	150,000
Marketting Study		\$	100,000
Preliminary Economic Assessment		\$	150,000
TOTAL		\$	5,150,000

Table 18. Summary and estimated cost of work plan proposed by SGS Geostat on the Montviel Property.



Figure 36. Geological map showing areas where SGS Geostat recommends follow-up drilling. A: High-grade zone in the S-W. B: Potential continuity of deep high grade across the Polygenetic Breccia. Yellow: Inter-layered Calciocarbonatite and Ferrocarbonatite; Green: Silicocarbonatite; Pink: Calciocarbonatite; Teal: Polygenetic Breccia; Red-Stippled: Phosphate rich Carbonatite.

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Figure 37. Possible geological scenario that SGS Geostat recommends drilling to test. See Figure 13 for the current geological interpretation.



Figure 38. Conceptual model illustrating potential opportunities (red box) that may exist locally that should be tested at this early stage of exploration. The blue box represents the extent of current drilling and corresponds roughly with the area covered in the map within Figure 36. See Figure 14 for details on the lithological model.



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## **Certificate of Qualified Person**

- a) I, Guy Desharnais Ph.D. P.Geo., am currently working as a geologist with SGS Canada Inc. Geostat at 10 Blvd. Seigneurie East, Suite 203, Blainville Quebec, Canada, JVC 3V5;
- b) This certificate concerns the technical report <u>"Montviel Core Zone REE Mineral Resource</u> Estimate Technical Report, Quebec" which is effective September 29, 2011;
- c) I have a B.Sc. honours degree from the geology department of the University of Manitoba with an undergraduate thesis on a mineralogical study within a metasomatized carbonate body. I recieved a Ph.D. in 2004 from the same university with a thesis entitled "Geochemical and Isotopic Investigation of Magmatism in the Fox River Belt: Tectonic and Economic Implications". This study focused on trace elements, including REEs within layered intrusions. I have worked continously as a geologist since my graduation from university and have completed projects on many comodities including Ni, Cu, Co, Pt, Pd, Au, Ag, Zn, Pb, Fe, P, Ti, Nb, REE and coal. I am a registered member of the Ordre Géologues du Québec (#1141). I am a "Qualified Person" as defined in the National Instrument 43-101;
- d) I did not visit the property;
- e) I am responsible for the sections 7 through 24 of the technical report in question.
- f) I am an independant of the issuer as defined in section 1.5 of the NI 43-101.
- g) I have had no prior involvement with the Montviel Property;
- h) I have read the National Instrument 43-101 and this technical report; and it has been prepared in compliance with this Instrument; and
- As of September 29, 2011, to the best of my knowledge, information, and belief, Sections 7-24 of this technical report, contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

Signed and dated this 11th day fo November, 2011 in Blainville Québec.

Signed and Sealed

Guy Desharnais Ph.D., P.Geo. SGS Canada Inc.

## Certificate of Qualified Person

To accompany the Report entitled: "Technical Report, Montviel Core Zone REE Mineral Resource Estimate Technical Report, Quebec for Geomega Resources Inc " dated September 29th, 2011.

I, Claude Duplessis Eng., do herby certify that:

- 1. I am an senior engineer and consultant with SGS Canada Inc. Geostat with an office at 10, Blvd de la Seigneurie East, Suite 203, Blainville, Quebec, Canada, J7C 3V5;
- 2. I am a graduate from the University of Quebec in Chicoutimi, Quebec in 1988 with a B.Sc.A in geological engineering and I have practiced my profession continuously since that time.
- 3. I am a registered member of the Ordre des ingénieurs du Québec (Registration Number 45523). I am also a registered engineer in the province of Alberta (Registration Number M77963).
- 4. I have worked as an engineer for a total of 23 years since my graduation. My relevant experience for the purpose of the Technical Report is: Over 19 years of consulting in the field of Mineral Resource estimation, orebody modeling, mineral resource auditing and geotechnical engineering. I have specific experience in modelling and estimation of resources at the Niobec Mine for Cambior and also for Minière du Nord Crevier at their Nb-Ta project both in Saguenay/Lac St-Jean Quebec.
- 5. I am responsible with the other author either singularly or jointly for parts 7 to 24 and singularly for parts 1 to 6 of: "Technical Report, Montviel Core Zone REE Mineral Resource Estimate Technical Report, Quebec for Geomega Resources Inc " dated September 29th, 2011".
- 6. I am an independent "qualified person" within the meaning of National Instrument 43-101 Standards of Disclosure for Mineral Projects of the Canadian Securities Administrators.
- 7. I did the personal inspection of the Montviel property on June 28th 2011.
- 8. I have had no prior involvement with the property that is the subject of this technical report.
- 9. I certify that there is no circumstance that could interfere with my judgment regarding the preparation of this technical report.
- 10. Neither I, nor any affiliated entity of mine, is at present, under an agreement, arrangement or understanding or expects to become, an insider, associate, affiliated entity or employee of Geomega Resources Inc. or any associated or affiliated entities.
- 11. Neither I, nor any affiliated entity of mine, own directly or indirectly, nor expect to receive, any interest in the properties or securities of Geomega Resources Inc., or any associated or affiliated companies.
- 12. I have read NI 43-101 and Form 43-101F1 and have prepared and read the report entitled: "Technical Report, Montviel Core Zone REE Mineral Resource Estimate Technical Report, Quebec for Geomega Resources Inc " dated September 29th, 2011 for Geomega Resources in compliance with NI 43-101 and Form 43-101F1.
- 13. As of September 29th 2011, to the best of my knowledge, information and belief, and, as of the date of this certificate, the section 1 to 6 in this technical report contain all scientific and technical information that is required to be disclosed to make this section of the technical not misleading.

Signed at Blainville, Quebec this November 11th, 2011

Signed and Sealed

Claude Duplessis Eng.