

#### **SEARCH MINERALS INC.**

# TECHNICAL REPORT ON THE FOXTROT PROJECT IN LABRADOR, NEWFOUNDLAND & LABRADOR, CANADA

NI 43-101 Report

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June 15, 2012

ROSCOE POSTLE ASSOCIATES INC.



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## 1 SUMMARY

#### **EXECUTIVE SUMMARY**

#### INTRODUCTION

Roscoe Postle Associates Inc. (RPA) was retained by Search Minerals Inc. (Search Minerals), to prepare an independent Technical Report on the Foxtrot Rare Earth Element (REE) Project (Foxtrot Project) near Port Hope Simpson, Labrador, Canada. The purpose of this report is to disclose the results of a Preliminary Economic Assessment (PEA) on Search Minerals' Foxtrot Project. This Technical Report conforms to National Instrument 43-101 (NI 43-101) Standards of Disclosure for Mineral Projects. RPA visited the Foxtrot Project site and field house on October 27, 2011.

Search Minerals is a public company that trades on the TSX Venture Exchange under the symbol SMY. Search Minerals is currently exploring 19 prospects on three REE properties in Labrador, Canada and holds additional properties in Newfoundland.

This PEA has evaluated an open pit mining approach combined with processing by gravity, magnetic separation, and flotation concentration, followed by acid baking and water leaching, producing a mixed rare earth carbonate concentrate. The preproduction period will be 2 years and the mine life will be 10 years. The processing rate will be 4,000 tpd with an average mill recovery of 79%.

This report is considered by RPA to meet the requirements of a PEA as defined in Canadian NI 43-101 regulations. The economic analysis contained in this report is based, in part, on Inferred Resources, and is preliminary in nature. Inferred Resources are considered too geologically speculative to have mining and economic considerations applied to them and to be categorized as Mineral Reserves. There is no certainty that the reserves development, production, and economic forecasts on which this PEA is based will be realized.

#### **CONCLUSIONS**

In RPA's opinion, the PEA indicates that the Foxtrot Project can achieve positive economic results in a scenario that includes open pit mining, and recovery of rare earth elements.



The LOM plan for the Project presents the mining of 14.3 Mt at an average grade of 0.58% Total Rare Earth Elements (TREE) over 10 years at a nominal production rate of 4,000 tpd. REE production is projected to total 66 million kilograms.

Specific conclusions by area of the PEA are as follows.

#### **GEOLOGY AND RESOURCES**

RPA estimated Mineral Resources on the Foxtrot deposit using drill hole data available from two phases of drilling, as of September 30, 2011. The Mineral Resource estimate uses a cut-off grade of 130 ppm dysprosium. This reporting cut-off grade, which corresponds to 150 ppm for the oxide form,  $Dy_2O_3$ , produces a Net Smelter Return (NSR) value considerably higher than the anticipated cost of mining and processing ore. Even with changes and uncertainties in the metal prices, recoveries and costs, material with more than 130 ppm Dy meets the requirement of the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definition Standards: that Mineral Resources have a reasonable prospect of economic extraction.

Indicated Mineral Resources are estimated to total 3.41 Mt at 0.89% TREE (or 1.07% Total Rare Earth Oxides (TREO)), and Inferred Mineral Resources are estimated to total 5.85 Mt at 0.80% TREE (or 0.96% TREO).

A third phase (Phase III) exploration program, completed in 2012, was aimed at extending the deposit in the Central Zone from 200 m to 400 m in depth (as described in a Search Minerals news release dated February 1, 2012). Phase III drilling was not included in the resource estimate used for this PEA, however, it will be included in a future resource update.

Within the Felsic Zone that hosts the rare-earth mineralization, the mineralization with economic potential is hosted in bands of felsic volcanics that are inter-layered with mafic bands. The first two phases of drilling have confirmed that it is possible to visually identify the felsic mineralization from the mafics. Statistical analysis of the multi-element inductively coupled plasma (ICP) data for the resource estimation studies also suggests that it is possible to identify the felsic material using automated classification based on major-element chemistry. The combination of a characteristic visual appearance and a characteristic multi-element signature creates many possibilities for efficient and



effective grade control. There are optical and chemical sorting technologies that should be very effective at segregating the higher-grade material from the mixed volcanics.

Statistical analysis of the assay data from the felsic samples shows that there is a bimodal distribution in the felsic bands. With the higher-grade population having grades approximately five times those of the lower-grade population, it may be possible to further upgrade the run-of-mine material into an even higher-grade product in fewer ore tonnes. To realize this possibility, a better understanding of the geology and mineralogy of the two felsic populations is needed.

The very strong correlations between the REEs will simplify grade control. The entire rare earth suite of elements occurs as a single package at the Foxtrot Project, and a future mining operation will not have to contend with the complications of having to mine material that has low grades of some REEs in order to recover higher-grades of other REEs.

#### **MINING**

RPA investigated production rates in the 3,000 tpd to 4,000 tpd range, for both open pit and underground mining methods. Within 200 m of surface, strip ratios remain low enough for open pit methods to produce more favourable results. Underground mining remains worth considering when Phase III drilling (to more than 400 m depth) is incorporated into the resource estimate.

The PEA production rate is 1,440,000 tpa or 4,000 tpd of REE bearing material. Mining of ore and waste (no pre-stripping of overburden is required, as the deposit is exposed on surface) would be carried out by the owner and by contractor to balance mining equipment requirements over the life of the operation.

The combination of owner-operated and contract mining will be carried out using a conventional open pit method consisting of the following activities:

- Drilling performed by conventional production rotary drills.
- Blasting using ANFO (ammonium-nitrate fuel oil) and a down-hole delay initiation system.



 Loading and hauling operations performed with hydraulic shovel, front-end loader and rigid frame haulage trucks.

Geotechnical and pit design parameters are assumptions based on comparable operations, and require site-specific investigation as the Project advances.

#### PROCESSING AND METALLURGY

Metallurgical testwork involved three beneficiation techniques to concentrate the REE in the Foxtrot sample, including Wilfley tabling, magnetic separation and flotation. The Wilfley tabling was used to test amenability to gravity concentration. Magnetic separation was used to reject magnetite from the Wilfley concentrates. Flotation was tested both as a primary method of concentration for the Foxtrot sample and as a scavenging method to recover additional REE from the Wilfley tails. The work was preliminary in nature.

Recovery of REEs from the combined beneficiation results ranges from 80% to 86%.

The gravity concentrate and the combined gravity/flotation concentrate (Table 13-4) were subjected to hydrometallurgical processing by acid leaching or acid baking at 200 °C to 250 °C followed by water leaching. The acid bake and water leach results produced high extractions.

Overall recoveries range from 79% to 82% for light rare earths, and 73% to 78% for heavy rare earths.

The process proposed for the PEA utilizes the following basic unit operations: crushing, grinding, gravity recovery, magnetic separation, flotation, acid bake, water leaching, and solution purification to recover a mixed REE product.

#### **ENVIRONMENT**

The Project is at an early stage and Search Minerals has not yet begun environmental baseline work or community consultation. Despite that, RPA does not anticipate any fatal flaws regarding environmental issues with the Project as proposed. The challenges normal to permitting and developing an open pit mine in Labrador are expected to be manageable.



#### **MARKETS**

The market for rare earth products is small and public information on price forecasts and sales terms are difficult to obtain. Current prices are tracked by sources such as Asian Metal and Metal-Pages<sup>TM</sup>, based on transactions.

Recent history shows international rare earth market prices growing at an unprecedented rate since China cut export quotas by approximately 40% in 2011. China's overwhelming control on the rare earth supply chain, from upstream mining to downstream processing and end-user products, is likely to remain intact on all but a few materials through 2016. Rare earth prices are expected to remain volatile in the short term.

Price forecasting in this environment is difficult, and certain to contain wide margins of error.

A small number of REE producers outside of China are likely to be in operation by the time the Foxtrot Project is developed. This is expected to saturate the market for LREO such as lanthanum and cerium, however, demand for high-value HREO (such as dysprosium) is expected to grow, and supply is expected to remain in deficit. Revenue for the Foxtrot Project is dominated by dysprosium, neodymium, and terbium, elements that are projected to remain in supply deficit.

Rare earth prices were selected from the low end of a range of available forecasts, averaging \$38/kg of TREO (net of separation charges). Q2 2012 spot prices, for comparison, average \$99/kg TREO (net).

RPA considers these rare earths prices to be appropriate for a PEA-level study, however, we note that the recent market volatility introduces considerably more uncertainty than a comparable base or precious metals project. This uncertainty is mitigated to some extent, by the selection of conservative rare earths pricing.

#### RECOMMENDATIONS

RPA recommends that Search Minerals continue collecting data to support the feasibility and licensing process, and proceed with further engineering studies.



Specific recommendations by area are as follows:

#### **GEOLOGY & MINERAL RESOURCES**

- Additional drilling should continue to test the deep extensions of the resource in the Central Area or should test the shallower lateral extensions of the resource.
   Infill drilling to increase the confidence in the resource estimate will be required before Mineral Reserves can be estimated.
- Update the Mineral Resource estimate with the results of Phase III drilling (completed in Q1 2012).
- Continue efforts to standardize the geological logging. In the current resource estimates, the Felsic Zone has been treated as a single geological domain, and no attempt has been made to identify and model higher-grade sub-domains with this broader zone. From the geological logging of the Phase I and Phase II holes, it is clear that there is a tendency for the better mineralization to lie along the southern edge of the Felsic Zone; in the geological logs, this higher grade sub-domain is often referred to as FT3, with FT2 and FT4 being lower-grade bands on either side. Although it is clear that the southern third of the Felsic Zone is the preferential host of the best mineralization, the logging of FT2, FT3 and FT4 is not spatially consistent in three dimensions (3D).
- If the review and standardization of the logging reveals that there is, indeed, a
  coherent and spatially continuous FT3 band, then future resource studies will be
  able to use this information to more accurately estimate the shape, tonnage and
  grades of this higher-grade core.
- The QA/QC programs used for the Phase I and II drilling have documented that the assay data are reliable for the purposes of resource estimation. With the recommendation for a considerable amount of additional drilling, it is important to continue to make every effort to monitor and control the accuracy and precision of the assay data. Recommended improvements to the existing QA/QC program include: 1) Regular monthly review of the QA/QC data received from the lab, and 2) Submission of standards, blanks and duplicates from the project site so that these quality monitoring samples are blind to the lab.

#### **MINING**

- Update PEA with results of Phase III drilling. Review underground trade-off with open pit mining as part of the update.
- Carry out geotechnical investigation for use in determining pit slopes and underground stope sizing.

#### **METALLURGICAL TESTWORK**

 The current testwork program at SGS should continue to define recoveries and potential flowsheet.



#### **ENVIRONMENTAL CONSIDERATIONS**

- Begin a program of environmental baseline study work.
- Engage in community and Aboriginal consultation regarding plans for the Project.

A budget for these recommendations has been estimated, as summarized in Table 1-1:

TABLE 1-1 BUDGET FOR PROJECT ADVANCEMENT Search Minerals Inc. – Foxtrot Project

Item	Cost (C\$)
Phase IV Drill Program (10,000 m)	\$1,500,000
Phase V Drill Program (30,000 m)	\$4,500,000
Mineral Resource Update	\$50,000
PEA Update	\$50,000
Metallurgical Testwork	\$100,000
Geotechnical Investigation	\$300,000
Environmental Baseline Studies	\$500,000
Total	\$7,000,000

#### **ECONOMIC ANALYSIS**

RPA conducted an economic analysis of the Foxtrot Project applying operating and capital costs estimates based on a 10 year production schedule.

The economic analysis shows that, at an average TREO basket price of \$38 per kilogram, the project yields pre-tax net NPV at a 10% discount rate of \$408 million. Total pre-tax undiscounted cash flow is \$1.1 billion. The cash flow is summarized in Table 1-2.

The total life-of-mine capital is approximately \$494 million, including approximately \$103 million in contingency capital. The average operating cost over the life of the project is approximately \$96.26 per tonne milled.

The Foxtrot Project will process an average of 1,440,000 tpa at an average grade of 0.58% TREE, and produce an average of 6.5 million kilograms of payable rare earth material per year.



Over the life of mine, the pre-tax Internal Rate of Return is 28.5% with a payback period of approximately 2.8 years.

#### **ECONOMIC CRITERIA:**

#### **REVENUE**

- 4,000 tonnes per day processing rate
- Average TREE recovery of 79%
- Average TREO basket price of \$38 per kg
- LREE Separation charge of \$5 per kg
- HREE separation charge of \$30 per kg
- Revenue is recognized at the time of production.

#### COSTS

- Pre-production period: two years
- Mine life: ten years
- Life of Mine production plan as summarized in Table 16-1
- Mine life capital totals \$494 million including contingency
- Average operating cost over the mine life is \$96.26 per tonne milled



#### TABLE 1-2 PRE-TAX CASH FLOW SUMMARY

				2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Mining	Input	Units	Total/Avg.	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12
Mined Ore by Owner Mined Waste by Owner Mined Waste by Contractor		tonnes tonnes tonnes	14,279,000 73,010,366 32,827,520			1,368,000 2,681,290 -	1,440,000 8,515,255	1,440,000 8,640,000 5,629,165	1,440,000 8,640,000 9,802,565	1,440,000 8,640,000 9,451,228	1,440,000 8,640,000 7,944,562	1,440,000 9,070,675	1,440,000 7,211,753	1,440,000 6,226,836	1,391,000 4,744,557		
Total Material Moved		tonnes	120,116,886			4,049,290	9,955,255	15,709,165	19,882,565	19,531,228	18,024,562	10,510,675	8,651,753	7,666,836	6,135,557		
Waste to Ore ratio			7.41			1.96	5.91	9.91	12.81	12.56	11.52	6.30	5.01	4.32	3.41		
Processing Ore to Mill		'000 tonnes tpd	14,279	-	-	1,368 3,909	1,440 4,114	1,440 4,114	1,440 4,114	1,440 4,114	1,440 4,114	1,440 4,114	1,440 4,114	1,440 4,114	1,391 3,974		
Head Grade Scandium	1.8	pom	1.8			1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8		
Yttrium Lanthanum	721.4 1.081.8	ppm ppm	721.4 1.081.8			721.4 1.081.8	721.4 1.081.8	721.4 1.081.8	721.4 1.081.8	721.4 1.081.8	721.4 1.081.8	721.4 1.081.8	721.4 1 081 8	721.4 1.081.8	721.4 1.081.8		
Cerium	2,185,7	ppm	2,185.7			2,185.7	2,185.7	2,185.7	2,185.7	2,185.7	2,185.7	2,185.7	2.185.7	2,185.7	2,185.7		
Praesodymium Neodymium	250.6 934.4	ppm ppm	250.6 934.4			250.6 934.4	250.6 934.4	250.6 934.4	250.6 934.4	250.6 934.4	250.6 934.4	250.6 934.4	250.6 934.4	250.6 934.4	250.6 934.4		
Samarium	168.3	ppm	168.3			168.3	168.3	168.3	168.3	168.3	168.3	168.3	168.3	168.3	168.3		
Europium Gadolinium	8.1 135.5	ppm ppm	8.1 135.5			8.1 135.5	8.1 135.5	8.1 135.5	8.1 135.5	8.1 135.5	8.1 135.5	8.1 135.5	8.1 135.5	8.1 135.5	8.1 135.5		
Terbium	22.1	ppm	22.1			22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1	22.1		
Dysprosium Holmium	128.4 24.7	ppm ppm	128.4 24.7			128.4 24.7	128.4 24.7	128.4 24.7	128.4 24.7	128.4 24.7	128.4 24.7	128.4 24.7	128.4 24.7	128.4 24.7	128.4 24.7		
Erbium Thulium	70.2 10.2	ppm ppm	70.2 10.2			70.2 10.2	70.2 10.2	70.2 10.2	70.2 10.2	70.2 10.2	70.2 10.2	70.2 10.2	70.2 10.2	70.2 10.2	70.2 10.2		
Ytterbium	64.2	ppm	64.2			64.2	64.2	64.2	64.2	64.2	64.2	64.2	64.2	64.2	64.2		
Lutetium Zirconium	9.6 7 110 7	ppm	9.6 7.110.7			9.6 7.110.7	9.6 7.110.7	9.6 7.110.7	9.6 7.110.7	9.6 7.110.7	9.6 7.110.7	9.6 7.110.7	9.6 7.110.7	9.6 7.110.7	9.6 7.110.7		
Niobium	471.0	ppm ppm	471.0			471.0	471.0	471.0	471.0	471.0	471.0	471.0	471.0	471.0	471.0		
Uranium LREE Grade	20.4	ppm ppm	20.4 4.620.8			20.4 4.620.8	20.4 4.620.8	20.4 4.620.8	20.4 4.620.8	20.4 4.620.8	20.4 4.620.8	20.4 4.620.8	20.4 4.620.8	20.4 4.620.8	20.4 4.620.8		
HREE Grade		ppm	1,194.4			1,194.4	1,194.4	1,194.4	1,194.4	1,194.4	1,194.4	1,194.4	1,194.4	1,194.4	1,194.4		
Total REE Grade		ppm	5,815.2 13,419.1			5,815.2 13,419.1	5,815.2 13,419.1	5,815.2 13,419.1	5,815.2 13,419.1	5,815.2 13,419.1	5,815.2 13,419.1	5,815.2 13,419.1	5,815.2 13,419.1	5,815.2 13,419.1	5,815.2 13,419.1		
Average Recovery			-,			-,	.,	.,	.,	.,	.,		.,	.,	.,		
Scandium	no info	%	0.0%			no info	no info	no info	no info	no info	no info	no info	no info	no info	no info		
Yttrium Lanthanum	79.5% 81.9%	% %	79.5% 81.9%			79.5% 81.9%	79.5% 81.9%	79.5% 81.9%	79.5% 81.9%	79.5% 81.9%	79.5% 81.9%	79.5% 81.9%	79.5% 81.9%	79.5% 81.9%	79.5% 81.9%		
Cerium	78.9%	%	78.9%			78.9%	78.9%	78.9%	78.9%	78.9%	78.9%	78.9%	78.9%	78.9%	78.9%		
Praesodymium Neodymium	82.3% 77.7%	% %	82.3% 77.7%			82.3% 77.7%	82.3% 77.7%	82.3% 77.7%	82.3% 77.7%	82.3% 77.7%	82.3% 77.7%	82.3% 77.7%	82.3% 77.7%	82.3% 77.7%	82.3% 77.7%		
Samarium	80.1%	%	80.1%			80.1%	80.1%	80.1%	80.1%	80.1%	80.1%	80.1%	80.1%	80.1%	80.1%		
Europium Gadolinium	79.5% 78.6%	% %	79.5% 78.6%			79.5% 78.6%	79.5% 78.6%	79.5% 78.6%	79.5% 78.6%	79.5% 78.6%	79.5% 78.6%	79.5% 78.6%	79.5% 78.6%	79.5% 78.6%	79.5% 78.6%		
Terbium	78.3%	%	78.3%			78.3%	78.3%	78.3%	78.3%	78.3%	78.3%	78.3%	78.3%	78.3%	78.3%		
Dysprosium Holmium	77.3% 77.5%	% %	77.3% 77.5%			77.3% 77.5%	77.3% 77.5%	77.3% 77.5%	77.3% 77.5%	77.3% 77.5%	77.3% 77.5%	77.3% 77.5%	77.3% 77.5%	77.3% 77.5%	77.3% 77.5%		
Erbium	77.6%	%	77.6%			77.6%	77.6%	77.6%	77.6%	77.6%	77.6%	77.6%	77.6%	77.6%	77.6%		
Thulium Ytterbium	77.8% 77.6%	% %	77.8% 77.6%			77.8% 77.6%	77.8% 77.6%	77.8% 77.6%	77.8% 77.6%	77.8% 77.6%	77.8% 77.6%	77.8% 77.6%	77.8% 77.6%	77.8% 77.6%	77.8% 77.6%		
Lutetium	77.7%	%	77.7%			77.7% 0.0%	77.7% 0.0%	77.7% 0.0%	77.7% 0.0%	77.7% 0.0%	77.7% 0.0%	77.7% 0.0%	77.7% 0.0%	77.7% 0.0%	77.7% 0.0%		
Niobium		%	0.0%			0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		
Uranium Total REE Average Recovery	79.6%	%	79.6%			79.6%	79.6%	79.6%	79.6%	79.6%	79.6%	79.6%	79.6%	79.6%	79.6%		
			79.3%														
Concentrate Weight Recovery Concentrate Tonnage	38.5%	'000 tonnes	5,495			38.5% 526	38.5% 554	38.5% 554	38.5% 554	38.5% 554	38.5% 554	38.5% 554	38.5% 554	38.5% 554	38.5% 535		
Concentrate Grades																	
Scandium Yttrium		ppm ppm	1.491			1,491	1,491	1,491	1,491	1,491	1,491	1,491	1,491	1,491	1,491		
Lanthanum		ppm	2,302			2,302	2,302	2,302	2,302	2,302	2,302	2,302	2,302	2,302	2,302		
Cerium Praesodymium		ppm ppm	4,478 536			4,478 536	4,478 536	4,478 536	4,478 536	4,478 536	4,478 536	4,478 536	4,478 536	4,478 536	4,478 536		
Neodymium Samarium		ppm	1,887 350			1,887 350	1,887 350	1,887 350	1,887 350	1,887 350	1,887 350	1,887 350	1,887 350	1,887 350	1,887 350		
Europium		ppm	17			17	17	17	17	17	17	17	17	17	17		
Gadolinium Terbium		ppm ppm	277 45			277 45	277 45	277 45	277 45	277 45	277 45	277 45	277 45	277 45	277 45		
Dysprosium		ppm	258			258	258	258	258	258	258	258	258	258	258		
Holmium Erbium		ppm ppm	50 142			50 142	50 142	50 142	50 142	50 142	50 142	50 142	50 142	50 142	50 142		
Thulium		ppm	21			21	21	21	21	21	21	21	21	21	21		
Ytterbium Lutetium		ppm ppm	129 19			129 19	129 19	129 19	129 19	129 19	129 19	129 19	129 19	129 19	129 19		
Zirconium		ppm	- "			- "		-	-		-	- "	-	-			
Niobium Uranium		ppm ppm	42			42	42	42	42	42	42	42	42	- 42	42		
Material Recovered																	
Scandium Yttrium		kg	8,190,737			- 784,714	- 826,015	826,015	826,015	826,015	826,015	- 826,015	826,015	826,015	707.007		
Lanthanum		kg kg	12,649,566			1,211,892	1,275,676	1,275,676	1,275,676	1,275,676	1,275,676	1,275,676	1,275,676	1,275,676	797,907 1,232,267		
Cerium Praesodymium		kg	24,608,778 2,943,882			2,357,645 282,039	2,481,731 296,883	2,481,731 296,883	2,481,731 296,883	2,481,731 296,883	2,481,731 296,883	2,481,731 296,883	2,481,731 296,883	2,481,731 296,883	2,397,283 286,781		
Neodymium		kg kg	10,368,299			993,335	1,045,616	1,045,616	1,045,616	1,045,616	1,045,616	1,045,616	1,045,616	1,045,616	1,010,036		
Samarium Europium		kg	1,924,567 91,967			184,383 8,811	194,088 9,275	194,088 9,275	194,088 9,275	194,088 9,275	194,088 9,275	194,088 9,275	194,088 9,275	194,088 9,275	187,483 8,959		
Gadolinium		kg kg	1,520,079			145,631	153,296	153,296	153,296	153,296	153,296	153,296	153,296	153,296	148,080		
Terbium Dysprosium		kg kg	247,025 1,417,786			23,666 135,831	24,912 142,980	24,912 142,980	24,912 142,980	24,912 142,980	24,912 142,980	24,912 142,980	24,912 142,980	24,912 142,980	24,064 138,115		
Holmium		kg	273,406			26,194 74,536	27,572	27,572	27,572	27,572	27.572	27,572	27,572	27,572	26.634		
Erbium Thulium		kg kg	778,002 113,320			74,536 10,857	78,459 11,428	78,459 11,428	78,459 11,428	78,459 11,428	78,459 11,428	78,459 11,428	78,459 11,428	78,459 11,428	75,790 11,039		
Ytterbium		kg kg	711,506			68,166	71,754	71,754	71,754	71,754	71,754	71,754	71,754	71,754	69,312		
Lutetium	1	kg kg	106,524			10,205	10,743	10,743	10,743	10,743	10,743	10,743	10,743	10,743	10,377		
Zirconium																	
Zirconium Niobium		kg ka	231.897			22.217	23.386	23.386	23.386	23.386	23.386	23.386	23.386	23.386	22.590		
Zirconium		kg kg kg	231,897 66,177,342 1.20%			22,217 6,340,122 1,20%	23,386 6,673,813 1,20%	23,386 6,673,813 1,20%	23,386 6,673,813 1,20%	23,386 6,673,813 1,20%	23,386 6,673,813 1,20%	23,386 6,673,813 1,20%	23,386 6,673,813 1,20%	23,386 6,673,813 1,20%	22,590 6,446,718 1,20%		



#### SENSITIVITY ANALYSIS

Project risks can be identified in both economic and non-economic terms. Key economic risks were examined by running cash flow sensitivities on:

- Head Grade;
- · Recovery;
- Rare Earth Oxide Prices;
- Operating Cost Per Tonne Milled, and
- Capital Cost.

The rare earths price sensitivity is based on results using a TREO base case price forecast, which equates to a \$38/kg net revenue basket price.

The pre-tax NPV (at 10%) sensitivity analysis has been calculated for -20% to +20% variations. The sensitivities are shown in Table 1-3, Figures 1-1 and 1-2. The NPV is most sensitive to rare earth oxide prices, followed by head grade and metallurgical recovery.



# TABLE 1-3 SENSITIVITY ANALYSIS Search Minerals Inc. – Foxtrot Project

#### Sensitivity to Head Grade

TREE (%)	NPV @ 10% Million	IRR
0.47	\$103	15%
0.52	\$256	22%
0.58	\$408	28%
0.64	\$561	34%
0.70	\$713	40%

#### Sensitivity to Recovery

REC%	NPV @ 10% Million	IRR
63.4%	\$103	15%
71.4%	\$256	22%
79.3%	\$408	28%
81.3%	\$446	30%
83.3%	\$484	31%

#### **Sensitivity to TREO Basket Price**

TREO C\$/kg	NPV @ 10% Million	IRR	
\$29	\$49	13%	
\$34	\$229	21%	
\$38	\$408	28%	
\$43	\$588	35%	
\$47	\$767	42%	

#### **Sensitivity to Operating Cost Per Tonne Milled**

C\$/t milled	NPV @ 10% Million	IRR
\$77	\$551	34%
\$87	\$479	31%
\$96	\$408	28%
\$106	\$337	26%
\$116	\$265	22%

#### **Sensitivity to Capital Cost**

C\$ Millions	NPV @ 10% Million	IRR	
\$395	\$491	36%	
\$445	\$450	32%	
\$494	\$408	28%	
\$544	\$367	25%	
\$593	\$325	23%	



FIGURE 1-1 NPV SENSITIVITY ANALYSIS

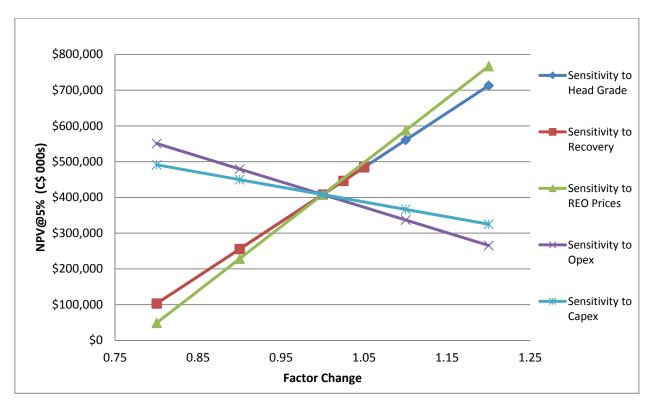
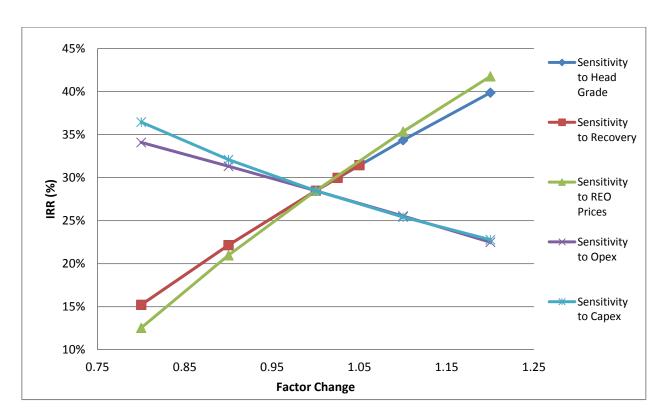


FIGURE 1-2 IRR SENSITIVITY ANALYSIS





#### **CURRENT PRICE SENSITIVITY ANALYSIS**

RPA further conducted a rare earth oxide price sensitivity using a current price forecast (Q2 2012), which equates to a \$99/kg net revenue basket price. The current prices used to analyze the model are presented in Table 1-4.

TABLE 1-4 CURRENT SPOT PRICES Search Minerals Inc. – Foxtrot Project

Rare Earth Oxide	FOB China Q2 2012 Spot* (US\$/kg)
Ce <sub>2</sub> O <sub>3</sub>	25
$La_2O_3$	24
$Nd_2O_3$	175
$Pr_2O_3$	140
$Sm_2O_3$	90
$Eu_2O_3$	2,300
$Gd_2O_3$	100
$Sc_2O_3$	7,200
$Y_2O_3$	132
$Yb_2O_3$	90
$Dy_2O_3$	1,100
$Er_2O_3$	195
$Ho_2O_3$	-
$Lu_2O_3$	-
$Tb_4O_7$	2,000
$Tm_2O_3$	-

<sup>\*</sup> Source: Metal-Pages.com

At current prices, the undiscounted pre-tax cash flow in this case totals \$5.9 billion. The IRR is 100% and the NPV is as follows:

- \$4.0 billion at a 5% discount rate
- \$3.3 billion at a 8% discount rate
- \$2.8 billion at a 10% discount rate



#### **TECHNICAL SUMMARY**

#### PROPERTY LOCATION

The Foxtrot Project is located in southeast Labrador, Canada, centered at 580000E, and 5806000N, UTM Grid Zone 21N, NAD83. The Project is located approximately 36 km east southeast of Port Hope Simpson, Labrador, and approximately ten kilometres west of St. Lewis, Labrador.

#### LAND TENURE

The Foxtrot Project is centrally located on contiguous claim blocks under 20 different licences, with a total of 734 claim blocks, each 500 m by 500 m, covering an area of 18,350 ha. Claims are either registered to Search Minerals or to Alterra Resources Inc. (Alterra), a wholly owned subsidiary of Search Minerals. No surface rights for construction or quarrying are known to exist. At the time of writing, all claims are held in good standing.

#### LOCAL RESOURCES AND INFRASTRUCTURE

The nearby communities of Port Hope Simpson, St. Lewis and Mary's Harbour have port access as well as airstrips that can facilitate transportation of goods required for exploration programs. St. Lewis has an ice-free harbour with deep water dock facilities and a small gravel airstrip suitable for small aircraft. Port Hope Simpson, St. Lewis, and Mary's Harbour, which have populations of approximately 500, 300, and 400 respectively, have various services including grocery stores, hardware stores, hotels and heavy equipment for rent and labourers for hire.

There is no electricity available on the Project site. The closest source is diesel generated electricity in the town of St. Lewis, ten kilometres away.

Water sources are plentiful at the Property.

#### HISTORY

Search Minerals began actively trading on the TSX-V under the symbol SMY after it successfully acquired all outstanding shares of Alterra, and made it a wholly-owned subsidiary. Alterra holds approximately 4,000 mineral claims including claims in the Port



Hope Simpson REE district (PHS). Search Minerals began extensive exploration on the district in late 2009 after it entered into a binding letter of intent to acquire an undivided 100% interest in certain claims in southeast Labrador owned by B and A Minerals Inc. known as the Port Hope Simpson property. Subsequent staking acquired adjacent land, including the Fox Harbour property and the Foxtrot Project.

Search Minerals began exploration on the Fox Harbour property within the PHS in the winter of 2009, conducting an airborne radiometric and magnetometer survey completed by Aeroquest. Within the Fox Harbour property, the Foxtrot Project was the main area of interest due to its elevated radiometric and magnetometer values.

Exploration in 2010 consisted of prospecting, mapping, lithogeochemical grab sampling, clearing, hand trenching, channel sampling with a portable circular saw and diamond drilling. This exploration program was conducted across the entire Fox Harbour volcanic belt, with the main area of focus being the Foxtrot Project.

Search Minerals commenced a Phase I drill program at Foxtrot Project in Q4 2010. The Phase I drill program consisted of 23 drill holes totalling 3,955 m to a depth of 100 m and along 2 km of strike. A Phase II drill program was completed in Q3 2011 and consisted of 20 drill holes totalling 4,083 m to a depth of 200 m along a 500m strike. The Mineral Resources estimate contained in this report is based on Phase I and II drilling.

A Phase III drill program commenced in Q4 2011 and was completed in Q1 2012.

There are no historical resource or reserves estimates on the Foxtrot Project.

There has been no past production on the Foxtrot Project.

#### **GEOLOGY AND MINERALIZATION**

The Fox Harbour property contains three extensive east-west to northwest trending volcanic belts, extending upwards of 30 km in length, and 50 m to 500 m in width. These volcanic belts are largely bound by megacrystic granitic augen gneiss, which is variably mylonitized at contacts. The Foxtrot Project is located within the central volcanic belt. These volcanic belts are interpreted to be bi-modal mafic and felsic volcanics, with intercalated volcaniclastic units located largely at contacts and within the mafic



volcanics. Mafic volcanics contain large epidote pods, up to one metre by 0.5 m in length and width, along with differential weathering of individual layers, indicating a volcanic protolith. The felsic volcanics have very consistent stratigraphy that can be followed based on the stratigraphic contacts, indicative weathering, mineralogy, geochemistry, magnetic susceptibility, aeromagnetic survey, and ground-based magnetic survey.

Phase I and Phase II drilling targeted the Mt Belt, a zone of inter-layered bands of mafic and felsic volcanic that lies between a mafic gneiss to the south and an augen gneiss to the north. This belt is predominantly felsic, with thinner bands of mafic volcanics tending to separate thicker bands of felsic volcanic.

All of the currently discovered mineralization with economic potential lies in the felsic bands of the Mt Belt, with the highest grades lying in a continuous band that has been locally designated as the FT3 by Search Minerals geologists. Other continuous and semi-continuous bands of felsic rocks, such as the FT2 and FT4, contain REE mineralization that is generally lower in grade and more spatially erratic.

The Fox Harbour bi-modal felsic and mafic volcanic package is host to REE mineralization. The Foxtrot Project is the thickest currently identified occurrence of these volcanic rocks in the Fox Harbour area. Mineralization in the Foxtrot Project is largely allanite, zircon, chevkinite, and fergusonite. Higher-grade mineralization occurs within specific volcanic packages that can be followed for tens of kilometres. These higher-grade zones are characterized by a dark groundmass, consisting of the mineral assemblage that includes all or some of the following minerals: magnetite, pyroxene, amphibole, amazonite, and biotite.

#### **EXPLORATION STATUS**

A Phase III exploration drill program was completed in Q1 2012 and consisted of 29 diamond drill holes totalling 10,896 m to a depth of 450 m along a 600 m strike. The drilling area focused on the main "thicker mineralization" of the project, which is approximately 100 m true width. Phase III data is not included in the current Mineral Resource estimate used in this PEA because it was completed after the cut-off date for the resource.



#### MINERAL RESOURCES

RPA estimated Mineral Resources on the Foxtrot Project deposit using drill hole data available as of September 30, 2011. The Mineral Resource estimate uses a cut-off grade of 130 ppm on dysprosium. Using preliminary assessments of metal prices and metallurgical recoveries, this reporting cut-off, which corresponds to 150 ppm on  $Dy_2O_3$ , produces an NSR value considerably higher than the cost of mining and processing ore. Even with changes and uncertainties in the metal prices, recoveries and costs, material with more than 130 ppm Dy meets the requirement of the CIM Definition Standards: that Mineral Resources have a reasonable prospect of economic extraction.

Mineral Resources have been estimated to a vertical depth of 200 m, and remain open at depth. On February 1, 2012, Search disclosed that Phase III drilling results confirm that mineralization extends beyond the depth covered by Mineral Resources.

Indicated Mineral Resources are estimated to total 3.41 Mt at 1.07% TREO, and Inferred Mineral Resources are estimated to total 5.85 Mt at 0.96% TREO (Table 1-5 and Table 1-6).



TABLE 1-5 INDICATED MINERAL RESOURCE ESTIMATE – SEPT. 30, 2011

Search Minerals Inc. – Foxtrot Project

		Central	Extensions	TOTAL
Tonnes (t)		3,410,000		3,410,000
Element	Units			
Υ	ppm	1,059		1,059
La	ppm	1,663		1,663
Ce	ppm	3,364		3,364
Pr	ppm	385		385
Nd	ppm	1,442		1,442
Sm	ppm	257		257
Eu	ppm	13		13
Gd	ppm	204		204
Tb	ppm	33		33
Dy	ppm	189		189
Ho	ppm	36		36
Er	ppm	102		102
Tm	ppm	15		15
Yb	ppm	91		91
Lu	ppm	13		13
Zr	ppm	9,640		9,640
Nb	ppm	698		698
LREE	%	0.71		0.71
HREE	%	0.18		0.18
TREE	%	0.89		0.89
Oxide	Units			
$Y_2O_3$	ppm	1,345		1,345
$La_2O_3$	ppm	1,946		1,946
CeO <sub>2</sub>	ppm	4,138		4,138
$Pr_6O_{11}$	ppm	466		466
$Nd_2O_3$	ppm	1,687		1,687
$Sm_2O_3$	ppm	298		298
$Eu_2O_3$	ppm	15		15
$Gd_2O_3$	ppm	234		234
Tb₄O <sub>7</sub>	ppm	39		39
Dy <sub>2</sub> O <sub>3</sub>	ppm	218		218
Ho <sub>2</sub> O <sub>3</sub>	ppm	42		42
Er <sub>2</sub> O <sub>3</sub>	ppm	116		116
Tm <sub>2</sub> O <sub>3</sub>	ppm	17		17
Yb <sub>2</sub> O <sub>3</sub>	ppm	103		103
$Lu_2O_3$	ppm	15		15
ZrO <sub>2</sub>	ppm	13,014		13,014
$Nb_2O_5$	ppm	879		879
LREO	%	0.85		0.85
HREO	%	0.21		0.21
TREO	%	1.07		1.07

#### Notes:

- 1. CIM definitions were followed for Mineral Resources.
- 2. Mineral Resources are estimated at a cut-off grade of 130 ppm Dy.
- 3. Numbers may not add due to rounding.
- 4. HREE = Eu+Gd+Tb+Dy+Ho+Er+Tm+Yb+Lu+Y
- 5. TREE = La+Ce+Pr+Nd+Sm+ Eu+Gd+Tb+Dy+Ho+Er+Tm+Yb+Lu+Y



TABLE 1-6 INFERRED MINERAL RESOURCE ESTIMATE - SEPT. 30, 2011 Search Minerals Inc. - Foxtrot Project

		Central	Extensions	TOTAL
Tonnes (t)		3,000,000	2,850,000	5,850,000
Element	Units			
Υ	ppm	1,043	988	1,016
La	ppm	1,648	1,277	1,467
Ce	ppm	3,314	2,616	2,974
Pr	ppm	380	302	342
Nd	ppm	1,418	1,129	1,277
Sm	ppm	253	207	231
Eu	ppm	13	10	11
Gd	ppm	202	173	188
Tb	ppm	32	29	31
Dy	ppm	187	175	181
Ho	ppm	36	34	35
Er	ppm	100	100	100
Tm	ppm	14	15	15
Yb	ppm	90	96	93
Lu	ppm	13	15	14
Zr	ppm	9,679	10,710	10,182
Nb	ppm	698	561	631
LREE	%	0.70	0.55	0.63
HREE	%	0.17	0.16	0.17
TREE	%	0.87	0.72	0.80
Oxide	Units			
Y <sub>2</sub> O <sub>3</sub>	ppm	1,324	1,255	1,290
$La_2O_3$	ppm	1,928	1,494	1,716
$CeO_2$	ppm	4,076	3,218	3,657
Pr <sub>6</sub> O <sub>11</sub>	ppm	460	365	414
$Nd_2O_3$	ppm	1,659	1,321	1,494
$Sm_2O_3$	ppm	294	240	268
Eu <sub>2</sub> O <sub>3</sub>	ppm	15	11	13
$Gd_2O_3$	ppm	232	200	216
$Tb_4O_7$	ppm	38	35	36
$Dy_2O_3$	ppm	215	201	208
$Ho_2O_3$	ppm	41	40	40
$Er_2O_3$	ppm	114	114	114
$Tm_2O_3$	ppm	16	17	17
$Yb_2O_3$	ppm	102	109	106
$Lu_2O_3$	ppm	15	17	16
$ZrO_2$	ppm	13,067	14,458	13,746
$Nb_2O_5$	ppm	880	<sup>^</sup> 707	796
LREO	%	0.84	0.66	0.75
HREO	%	0.21	0.20	0.21
TREO	%	1.05	0.86	0.96

#### Notes:

- CIM definitions were followed for Mineral Resources.
   Mineral Resources are estimated at a cut-off grade of 130 ppm
   Numbers may not add due to rounding.
   HREO = oxide sums of Eu+Gd+Tb+Dy+Ho+Er+Tm+Yb+Lu+Y Mineral Resources are estimated at a cut-off grade of 130 ppm Dy.

- 5. TREO = oxide sums of La+Ce+Pr+Nd+Sm+ Eu+Gd+Tb+Dy+Ho+Er+Tm+Yb+Lu+Y



#### MINING METHODS

RPA investigated the potential for open pit mining of the Indicated and Inferred Mineral Resources, using REE prices appropriate for a PEA. Open pit and underground mining options were evaluated with run of mine (ROM) material being processed at a rate of 3,000 tpd to 4,000 tpd in a process plant on site producing a mixed rare earth product. At estimated operating costs, open pit mining was found to be the more profitable option.

Mining of mineralized material and waste will be carried out by the owner and by contractor to balance mining equipment requirements over the life of the operation. No pre-stripping of overburden is required, as the deposit is exposed on surface.

The combination of owner-operated and contract mining will be carried out using a conventional open pit method consisting of drilling, blasting, loading and hauling operations. The production equipment will be supported by bulldozers, graders, and water trucks.

Open pit possibilities were investigated by pit optimization / floating cone analysis, using Whittle software, run on the resource block model. Pit optimizations indicated that a significant proportion of the resource block model would be economic to mine using open pit methods.

Whittle pit optimizations were performed based on typical costs for comparable operations and projects of a similar scale. In the absence of geotechnical information, pit slope angles were selected based on industry averages. Pit optimizations were carried out using pit slopes of 45°.

Production quantities total 14.3 Mt of potentially mineable ore, at a grade of 0.58% total REE. This includes dilution of the mineralized felsic material with the intercalated mafic material in each block (assumed to have zero grade). The mafic material portion within mineralized blocks in the final pit shell supporting the above tonnage is equivalent to an internal dilution of 27.7%. A 100% mining recovery factor was applied. Waste within the pit shell totals 105.8 Mt, resulting in an average strip ratio of 7.4:1.

The proportion of Inferred Resources in the material that may be potentially mineable via open pit is approximately 65%.



Highlights of the production schedule are as follow:

- Pre-production period of two years
- Ramp-up to full production in Year 1
- Production of 1,440,000 tonnes per year, or 4,000 tpd
- Waste mining average of 10.6 Mt per year
- Contractor assistance with high waste mining requirements in years 3 to 6

#### MINERAL PROCESSING AND METALLURGICAL TESTING

Three beneficiation techniques were studied in order to concentrate the REE in the Foxtrot sample, including Wilfley tabling, magnetic separation and flotation. The Wilfley tabling was used to test amenability to gravity concentration. Low Intensity Magnetic Separation (LIMS) was used to reject magnetite from the Wilfley concentrates. Flotation was tested both as a primary method of concentration for the Foxtrot sample and as a scavenging method to recover additional REE from the Wilfley tails. The work was preliminary in nature.

The metallurgical process has been studied from initial recovery of a REE concentrate through to the purification of a leach solution and precipitation of a mixed product. Average recovery used in this PEA was 79%. These results show that conventional beneficiation methods may be used to recover the REE minerals. Additional testwork using more selective beneficiation or incorporation of cleaning steps in the circuit may improve recoveries.

The recommended process will utilize the crushing, grinding, gravity recovery, magnetic separation, flotation, water leaching, acid bake, and solution purification to recover a mixed REE product.

Ore will be crushed, ground and screened to produce a suitable sized product for gravity recovery. The product will be subjected to magnetic separation to remove magnetite. The tailings from the gravity recovery step will be subjected to flotation to increase REE recovery.



The non-magnetics and the flotation concentrate will be combined and sent to acid baking, and then to a water leaching step. The product from water leaching will go to solid liquid separation, with the REE containing solution sent to solution purification. After solution purification, oxalic acid will be added to the remaining solution to form REO containing precipitate. This precipitate will be sent to solid/liquid separation to provide a solid mixed REO product, and a liquid residue.

#### **ENVIRONMENTAL, PERMITTING, AND SOCIAL CONSIDERATIONS**

The Project will require environmental baseline study work to support permitting efforts and assist in Project design to avoid or minimize potential adverse effects. RPA is not aware of any baseline work completed to date.

Mining projects in the Province of Newfoundland and Labrador are subject to Environmental Assessment (EA) under the Newfoundland and Labrador Environmental Protection Act. They can also be subject to an environmental assessment under the Canadian Environmental Assessment Act (CEAA) if an approval is required from a federal agency. All provincial and federal EA processes are public.

The implementation of an effective community and Aboriginal engagement program is fundamental to the successful environmental permitting of mining projects. The purpose of this program is to ensure that all potentially affected persons, businesses, and communities have a full understanding of the Project and an opportunity to share information with respect to concerns regarding potential effects, and so the proponent has an opportunity to explain how these concerns are addressed in the Project design and operations. This program typically begins in the early stages of project planning and continues through the life of the Project.

A formal Rehabilitation and Closure Plan is required to obtain approval for project development under the Newfoundland and Labrador Mining Act. This plan is required to be submitted with or immediately following the submission of the Project Development Plan and provides the basis for the establishment of the Financial Assurance for the Project. The Mining Act requirements will only be reviewed following release of the project from Environmental Assessment, and the review and approval process can typically take four months to one year.



While RPA has not completed a closure plan for the Project, an allowance of \$18 million has been included in the PEA cash flow. This estimate is based on comparison to similar projects.

#### **CAPITAL AND OPERATING COST ESTIMATES**

#### CAPITAL COSTS

The mine, mill and site infrastructure costs are summarized in Table 1-7. All costs in this section are in 2012 Canadian dollars unless otherwise specified.

TABLE 1-7 CAPITAL COST SUMMARY Search Minerals Inc. – Foxtrot Project

Cost Area	Initial (C\$ million)	Sustaining (C\$ million)
Surface Infrastructure	41.0	3.7
Mining	36.7	9.3
Processing	138.4	6.1
Tailings	29.1	10.0
Owners/Indirect Costs	61.3	0.0
Rehabilitation & Mine Closure	0.0	19.0
EPCM	36.8	0.0
Contingency	103.0	0.0
Total	446.3	48.1

For the purpose of the economic analysis, the total capital cost including initial and sustaining capital costs is \$494.4 million.

Capital costs were estimated using cost models, unit prices, suppliers' budget quotes, preliminary designs, general industry knowledge and experience, and other information from recent similar Projects. The expected accuracy on cost estimates is ±35%, which is typical of a PEA study.

Engineering, procurement, and construction management (EPCM), and contingency for all capital cost components vary depending on cost area. In order to estimate these components, specific factors were applied. A 15% factor for EPCM and a 30% factor for contingency were applied to initial direct capital costs. The capital cost totals for EPCM and contingency are \$36.8 million and \$103.0 million, respectively.



#### **OPERATING COSTS**

Mine life average operating unit costs for the Project are shown in Table 1-8.

TABLE 1-8 UNIT OPERATING COSTS SUMMARY Search Minerals Inc. – Foxtrot Project

Cost area	<b>LOM Unit Cost</b>	<b>LOM Unit Cost</b>
	(C\$/t milled)	(C\$/t moved)
Mining (Owner/Contractor)	35.64	4.24
Processing	52.50	
G&A	8.12	
Total operating cost	96.26	

Mine operating costs were estimated using cost models, unit prices, suppliers' budget quotes, general knowledge and experience, preliminary designs, and other information from recent similar projects.

Process operating costs were estimated using similar rare earth projects in similar geopolitical jurisdictions and includes consideration for diesel power generation, maintenance, reagents and other consumables.

General and administration expenses (G&A) comprise the cost of administration services and staff, as well as management-level human resources for engineering, geology, environment, and construction. The remaining costs are for material and supplies, some consultants, insurance and taxes, and communications.

The expected accuracy on cost estimates is of PEA study level (±35%).



# **2 INTRODUCTION**

Roscoe Postle Associates Inc. (RPA) was retained by Jim Clucas, CEO and President of Search Minerals Inc. (Search Minerals), to prepare an independent Technical Report on the Foxtrot Rare Earth Element (REE) Project (Foxtrot Project) near Port Hope Simpson, Labrador, Canada. The purpose of this report is to disclose the results of a Preliminary Economic Assessment (PEA) on Search Minerals' Foxtrot Project. This Technical Report conforms to National Instrument 43-101 (NI 43-101) Standards of Disclosure for Mineral Projects. RPA visited the Foxtrot Project site and field house on October 27, 2011.

Search Minerals is a public company that trades on the TSX Venture Exchange under the symbol SMY. Search Minerals is currently exploring 19 prospects on three REE properties in Labrador, Canada and holds additional properties in Newfoundland.

This PEA has evaluated an open pit mining approach combined with processing by gravity, magnetic separation, and flotation concentration, followed by acid leaching, producing a mixed rare earth carbonate concentrate.

The pre-production period will be two years and the mine life will be ten years. The processing rate will be 4,000 tpd with an average mill recovery of 79%.

This report is considered by RPA to meet the requirements of a PEA as defined in Canadian NI 43-101 regulations. The economic analysis contained in this report is based, in part, on Inferred Resources, and is preliminary in nature. Inferred Resources are considered too geologically speculative to have mining and economic considerations applied to them and to be categorized as Mineral Reserves. There is no certainty that the reserves development, production, and economic forecasts on which this PEA is based will be realized.

#### SOURCES OF INFORMATION

Jacques Gauthier, P.Eng., RPA Principal Mining Engineer, and Rick Breger, Benchmark Six Inc., visited Search Mineral's Foxtrot Project site to carry out a site visit on October



27, 2011. On site Mr. Gauthier and Mr. Breger observed exploration activities and visited the Project's field house to examine core.

Discussions were held with personnel related to the Project:

- Mr. James D. Clucas, President, CEO, Director, Search Minerals Inc.
- Dr. David B. Dreisinger, Ph.D., Vice President Technology, Director, Search Minerals Inc.
- Dr. Randy Miller, Ph.D., P.Geo, Vice President Exploration, Search Minerals Inc.
- James Haley, B.Sc., Project Geologist, Search Minerals Inc.
- Michael Upshall, GIS Analyst, Search Minerals Inc.
- Rob Hoffman, Lithogeochemistry Manager, Activation Laboratories Ltd.
- Nicole Devereaux, Geologist, Search Minerals Inc.

Mr. R. Mohan Srivastava, P.Geo, associate consulting geologist with RPA, and President of Benchmark Six, has reviewed all of the data and information gathered during the site visit and has overall responsibility for the Technical Report.

The documentation reviewed, and other sources of information, are listed at the end of this report in Section 27 References.



#### **LIST OF ABBREVIATIONS**

Units of measurement used in this report conform to the Metric system. All currency in this report is Canadian dollars (C\$) unless otherwise noted.

	micron	kW	kilowatt
μ °C	degree Celsius	kWh	kilowatt-hour
°F	degree Fahrenheit	L	litre
	microgram	LREE	light rare earth elements
μg			light rare earth oxides
A	ampere	LREO L/s	•
a	annum		litres per second
bbl	barrels	m M	metre
Btu	British thermal units	M m <sup>2</sup>	mega (million)
C\$	Canadian dollars	m <sup>3</sup>	square metre
cal	calorie		cubic metre
cfm	cubic feet per minute	min	minute
cm	centimetre	MASL	metres above sea level
cm <sup>2</sup>	square centimetre	mm	millimetre
d	day	mph	miles per hour
dia.	diameter	MVA	megavolt-amperes
dmt	dry metric tonne	MW	megawatt
dwt	dead-weight ton	MWh	megawatt-hour
ft	foot	m <sup>3</sup> /h	cubic metres per hour
ft/s	foot per second	opt, oz/st	ounce per short ton
ft <sup>2</sup>	square foot	OZ	Troy ounce (31.1035g)
ft <sup>3</sup>	cubic foot	ppm	part per million
g G	gram	psia	pound per square inch absolute
	giga (billion)	psig	pound per square inch gauge
Gal	Imperial gallon	REE	rare earth element
g/L	gram per litre	REO	rare earth oxide
g/t	gram per tonne	RL	relative elevation
gpm	Imperial gallons per minute	S	second
gr/ft <sup>3</sup>	grain per cubic foot	st	short ton
gr/m <sup>3</sup>	grain per cubic metre	stpa	short ton per year
hr	hour	stpd	short ton per day
HREE	heavy rare earth elements	t	metric tonne
HREO	heavy rare earth oxides	t/m <sup>3</sup>	tonnes per cubic metre
ha	hectare	tpa	metric tonne per year
hp	horsepower	tpd	metric tonne per day
in	inch	TREE	total rare earth elements
in <sup>2</sup>	square inch	TREO	total rare earth oxides
J	joule	US\$	United States dollar
k	kilo (thousand)	USg	United States gallon
kcal	kilocalorie	USgpm	US gallon per minute
kg	kilogram	V	volt
km	kilometre	W	watt
km/h	kilometre per hour	wmt	wet metric tonne
km <sup>2</sup>	square kilometre	yd <sup>3</sup>	cubic yard
kPa	kilopascal	yr	year
kVA	kilovolt-amperes		



# **3 RELIANCE ON OTHER EXPERTS**

This report has been prepared by RPA for Search Minerals. The information, conclusions, opinions, and estimates contained herein are based on:

- Information available to RPA at the time of preparation of this report,
- · Assumptions, conditions, and qualifications as set forth in this report, and
- Data, reports, and other information supplied by Search Minerals and other third party sources.

For the purpose of this report, RPA has relied on ownership information provided by Search Minerals. RPA has not researched property title or mineral rights for the Foxtrot Project and expresses no opinion as to the ownership status of the property.

Except for the purposes legislated under provincial securities law, any use of this report by any third party is at that party's sole risk.



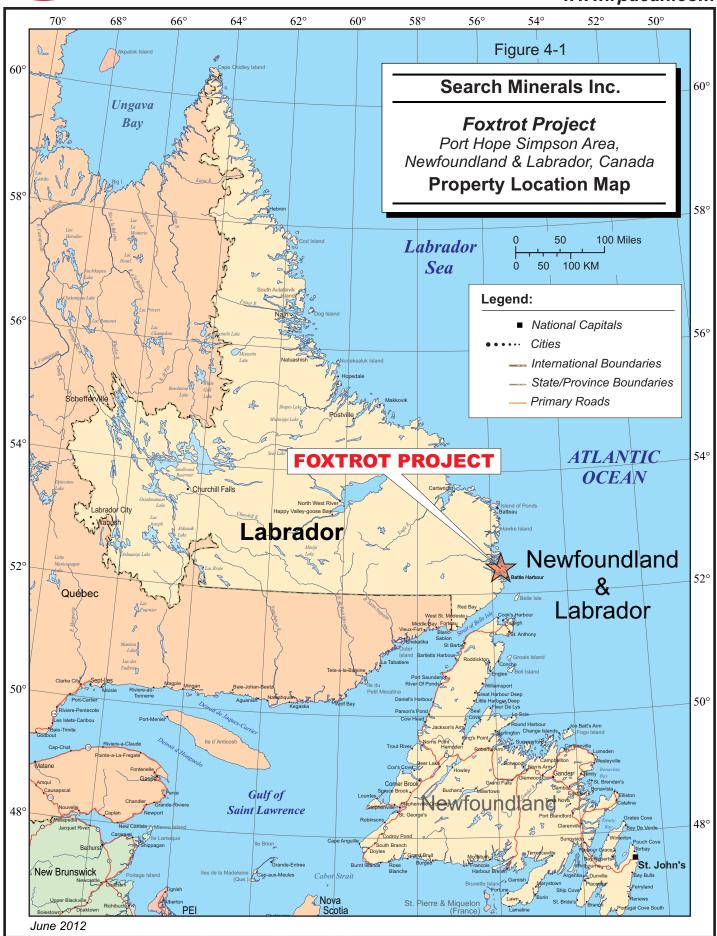
### 4 PROPERTY DESCRIPTION AND LOCATION

#### PROPERTY DESCRIPTION

Search Minerals began to acquire property in the Port Hope Simpson area in 2009 when it announced it had entered into a binding letter of intent with B and A Minerals Inc. to acquire an undivided 100% interest in their Port Hope Simpson property. Additional property was staked shortly after (by Alterra/Search Minerals) to acquire the adjacent Fox Harbour volcanic belt, which contains the Foxtrot Project, based on Search's REE exploration model. Since then the company has conducted a two-phase exploration program at the Foxtrot Project drilling over 8,000 m to a depth of 200 m.

The Foxtrot Project is located in southeast Labrador, Canada, centered at 580000E, and 5806000N, UTM Grid Zone 21N, NAD83 (Figures 4-1 and 4-2). The Project is located approximately 36 km east-southeast of Port Hope Simpson, Labrador, and approximately ten kilometres west of St. Lewis, Labrador.







### CLAIMS, STANDING, AND LAND TENURE

The Foxtrot Project is centrally located on contiguous claim blocks, under 20 different licences, with a total of 734, 500 m by 500 m claim blocks covering an area of 18,350 ha. Claims are either registered to Search Minerals or to Alterra Resources Inc. (Alterra), a wholly owned subsidiary of Search Minerals. No surface rights for construction or quarrying are known to exist. At the time of writing, all claims are held in good standing. Licence details and statistics are summarized in Table 4-1.

TABLE 4-1 SUMMARY OF LICENCE AND CLAIM BLOCK STATISTICS
Search Minerals Inc. – Foxtrot Project

License Number	Number of Claims	Area (ha)	Issuance Date	Renewal Date	Next Work Due	Expenditures Required
016939M	43	1.075	12/21/09	12/21/14	12/21/11	\$4,643.47
016940M	30	750	12/21/09	12/21/14	12/21/11	\$475.03
016941M	57	1.425	12/21/09	12/21/14	12/21/12	\$15,549.08
016942M	25	625	12/21/09	12/21/14	12/21/11	\$2,439.84
016943M	73	1.825	12/21/09	12/22/14	12/22/11	\$6,851.10
016944M	24	600	12/22/09	12/22/14	12/22/20	\$21,600.00
016949M	53	1.325	12/24/09	12/24/14	12/24/20	\$47,700.00
016950M	3	75	12/24/09	12/24/14	12/24/11	\$394.44
016951M	14	350	12/24/09	12/24/14	12/24/11	\$1,171.51
016955M	52	1.300	12/28/09	12/28/14	12/28/17	\$6,162.47
016956M	2	50	12/28/09	12/28/14	12/28/13	\$140.97
016957M	22	550	12/28/09	12/28/14	12/28/11	\$637.57
017869M	37	925	08/04/10	08/04/15	08/04/13	\$6,839.52
016480M	4	100	09/17/09	09/17/14	09/17/13	\$1,333.28
016620M	26	650	11/02/09	11/02/14	11/02/12	\$1,167.76
017646M	18	450	05/15/10	05/14/15	05/14/12	\$4,284.35
019367M	62	1.550	09/28/11	09/28/16	09/29/12	\$12,400.00
019368M	2	50	09/28/11	09/28/16	09/28/12	\$400.00
019369M	62	1.550	09/28/11	09/28/16	09/28/12	\$12,400.00
019370M	125	3.125	09/28/11	09/28/16	09/28/12	\$25,000.00
TOTAL	734	18.350				\$171,590.39

### **ENVIRONMENTAL STATUS AND PERMITTING**

Permits must be obtained for drilling, trenching, and water use. Activities that only require notification include geology, prospecting, ground geophysics, and all forms of geochemistry and line cutting. Applications for permits and notifications are submitted to the Government of Newfoundland and Labrador, Department of Natural Resources, Mines Branch, Mineral Lands Division.



Search Minerals was fully permitted to conduct all work performed during the 2010 and 2011 exploration programs and remains fully permitted to conduct all current work being done.



# 5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

### **ACCESSIBILITY**

The Foxtrot Project is located approximately 36 km east southeast of Port Hope Simpson, and approximately 10 km west northwest of St. Lewis, Labrador. The majority of the property is accessible via Highway 513, which is an all season gravel highway. Properties not adjacent to the roadside are within walking distance. Diamond drill hole locations on licenses 016955M, 016944M and 016949M are located approximately 0.5 km from the adjacent Highway 513.

Travel to mine site from Goose Bay is available via charter plane, helicopter and road. Goose Bay is a preferred hub as it is regularly serviced from eastern Canadian cities including Quebec City and Montreal, Quebec and Halifax, Nova Scotia. Flight time from exploration site to Goose Bay by helicopter is approximately two hours, and by plane approximately one hour. Road travel from Goose Bay to mine site is approximately six hours.

### CLIMATE

Port Hope Simpson is subject to a maritime climate. During the six month field season, temperatures range from an average low of -1 °C in May, to an average high of 18 °C in July and August. Over the same time period, average monthly precipitation ranges from 64 mm in May, to 92 mm in June. Average monthly snowfall in May and June are 8 cm and 3 cm, respectively; snow is not expected in the remaining months of the field season. Drilling activities can occur all year around due to relatively mild winters.

#### LOCAL RESOURCES AND INFRASTRUCTURE

The nearby communities of Port Hope Simpson, St. Lewis and Mary's Harbour have port access as well as airstrips that can facilitate transportation of goods required for exploration programs. St. Lewis has deep water dock facilities and a small gravel airstrip suitable for small aircraft. Port Hope Simpson, St. Lewis, and Mary's Harbour, which have populations of approximately 500, 300, and 400 respectively, have various services



including grocery stores, hardware stores, hotels and, heavy equipment for rent and labourers for hire.

There is no electricity available on the Project site. The closest source is diesel generated electricity in the town of St. Lewis, 8km away.

Water sources are plentiful at the Property.

#### **PHYSIOGRAPHY**

Elevation ranges from sea level to approximately 100 m. Topography is rugged with generally east-west striking ridges and hills with low lying areas containing rivers, ponds and brooks that generally drain east into St. Lewis Inlet. As an ecoregion, the property can be classified as 'Coastal Barrens' with the majority of the property being scrubland. Vegetation consists of isolated black and white spruce stands in sheltered valleys, mosses, lichens and Labrador tea in more barren areas and lichen-covered bedrock in higher areas and along ridges.



## **6 HISTORY**

Search Minerals began actively trading on the TSX Venture Exchange under the symbol SMY after it successfully acquired all outstanding shares of Alterra and made it a wholly-owned subsidiary. Alterra holds approximately 4,000 mineral claims including claims in the Port Hope Simpson (PHS) REE district. Search Minerals began extensive exploration in the district in 2009 after it entered into a binding letter of intent to acquire an undivided 100% interest in certain claims in southeast Labrador owned by B and A Minerals Inc. known as the Port Hope Simpson property. Subsequent staking acquired adjacent land, including the Fox Harbour property and the Foxtrot Project.

There are no historical resource or reserves estimates on the Foxtrot Project.

There is no past production on the Foxtrot Project.



# 7 GEOLOGICAL SETTING AND MINERALIZATION

### REGIONAL GEOLOGY

The Foxtrot Project occurs adjacent and within the boundaries of three tectonic terranes within the eastern Grenville Province, Labrador. Terranes include the Lake Melville terrane, Mealy Mountain terrane and the Pinware terrane, from north to south, respectively. Differing lithologies, structures and metamorphic signatures distinguish these terranes from one another; they are largely separated and defined by major fault zones (Gower et al., 1987, 1988; Gower, 2010; Hanmer and Scott, 1990).

The Foxtrot Project is located adjacent to the south of the Lake Melville terrane, also referred to as the Gilbert River Belt, to the southeast. This terrane is characterized by the Alexis River anorthosite, biotite-bearing granite, granodiorite and quartz diorite to diorite gneiss (Gower et al., 1987, 1988; Gower 2010; Hanmer and Scott, 1990). The Fox Harbour fault zone is thought to separate the Lake Melville terrane from the Pinware terrane to the south.

The Mealy Mountain terrane occurs to the northwest of the Foxtrot Project. This terrane contains mostly biotite granitic gneiss, potassium feldspar megacrystic granite gneiss, quartz diorite to dioritic gneisses and pelitic to semipelitic sedimentary gneisses (Gower et al., 1987, 1988; Gower, 2010).

The Pinware domain, in the St. Lewis Inlet area, consists of metamorphosed felsic to intermediate intrusions and older intercalated quartzo-feldspathic supracrustal rocks. Intrusions consist mainly of granite, k-feldspar megacrystic granite, quartz monzonite, granodiorite and supracrustal rocks consisting mainly of felsic volcanic rocks and arenitic sediments (Gower, 2007, 2010).

Granitic pegmatites cut most units in the region, but are largely absent from the Fox Harbour area.

Figure 7-1 presents the Foxtrot Project regional geology.

7-2



### LOCAL GEOLOGY

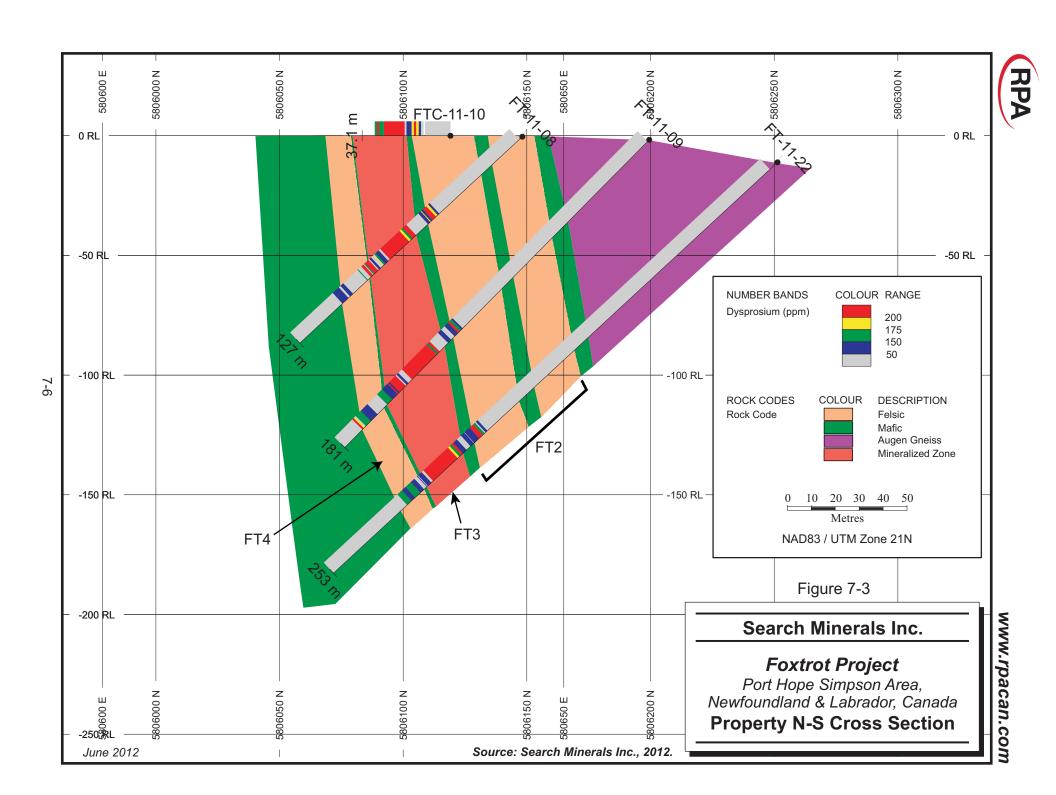
The Foxtrot Project contains three extensive east-west to northwest trending volcanic belts, extending upwards of 30 km in length, and approximately 50 m to 500 m in width (Figure 7-2). These volcanic belts are largely bound by megacrystic granitic augen gneiss, which is variably mylonitized at contacts. The Foxtrot Project is located within the central volcanic belt. These volcanic belts are interpreted to be bi-modal mafic and felsic volcanics, with intercalated volcaniclastic units located largely at contacts and within the mafic volcanics. Mafic volcanics contain large epidote pods, up to one metre by 0.5 m in length and width, along with differential weathering of individual layers, indicating a volcanic protolith. The felsic volcanics have very consistent stratigraphy that can be followed based on the stratigraphic contacts, indicative weathering, mineralogy, geochemistry, magnetic susceptibility, aeromagnetic survey, and ground-based magnetic survey.



### PROPERTY GEOLOGY

Phase I and Phase II drilling targeted the Mt Belt (Figure 7-2), a zone of inter-layered bands of mafic and felsic volcanic rocks that lies between a mafic gneiss to the south and an augen gneiss to the north. As shown in Figure 7-3, this belt is predominantly felsic, with thinner bands of mafic volcanics tending to separate thicker bands of felsic volcanic.

All of the currently discovered mineralization with economic potential lies in the felsic bands of the Mt Belt, with the highest grades lying in a continuous band that has been locally designated as the FT3 by Search Minerals geologists. Other continuous and semi-continuous bands of felsic rocks, such as the FT2 and FT4, contain REE mineralization that is generally lower in grade and more spatially erratic.





### RARE EARTH MINERALIZATION

The Fox Harbour bi-modal felsic and mafic volcanic package is host to REE mineralization. The Foxtrot Project is the thickest explored occurrence of these volcanic rocks in the Fox Harbour area. Mineralization in the Foxtrot Project is largely allanite, zircon, chevkinite, and fergusonite. Higher-grade mineralization occurs within specific volcanic packages that can be followed for tens of kilometres. These high-grade zones are characterized by a dark groundmass, consisting of the mineral assemblage that includes all or some of the following minerals: magnetite, pyroxene, amphibole, amazonite, and biotite.



# **8 DEPOSIT TYPES**

The Foxtrot Project REE deposit type has not been previously described. It is not peralkaline in nature but is closely related to that deposit type as described below by the Newfoundland and Labrador Geological Survey Mineral Commodity Series (2011):

Rare-earth elements and rare-metal deposits in peralkaline suites define two endmember-types that are respectively dominated by magmatic and metasomatichydrothermal processes, but many deposits exhibit evidence for both processes. In
magmatic examples, the ore minerals are dispersed as essential components of igneous
rocks, notably in pegmatites and aplites, and hydrothermal alteration is limited. The host
rocks may be either of plutonic or volcanic origin, although the former are more common.
In metasomatic-hydrothermal examples, mineralization is superimposed on pre-existing
rock units (which may be of peralkaline affinity) reflecting the transfer of metals in
magmatic hydrothermal fluids to form replacement zones or vein systems. In such
deposits, hydrothermal alteration is more widespread. Both processes operate together
and a complex continuum of mineralization styles may occur. However, the REE and
related metals are all incompatible trace elements that are concentrated by magmatic
fractionation in peralkaline magmas, and this process appears to be fundamental to
deposit genesis.

Rare-earth elements and rare-metal deposits may include a wide variety of uncommon minerals in addition to better-known minerals such as zircon, allanite, titanite, monazite and xenotime. The mineralogy of these deposits is a critical factor in their economic evaluation, as some REE-bearing minerals are highly resistant to chemical solvent extraction processes. In many cases, custom-process design is required to successfully extract the desired commodities from ore, and from each other.

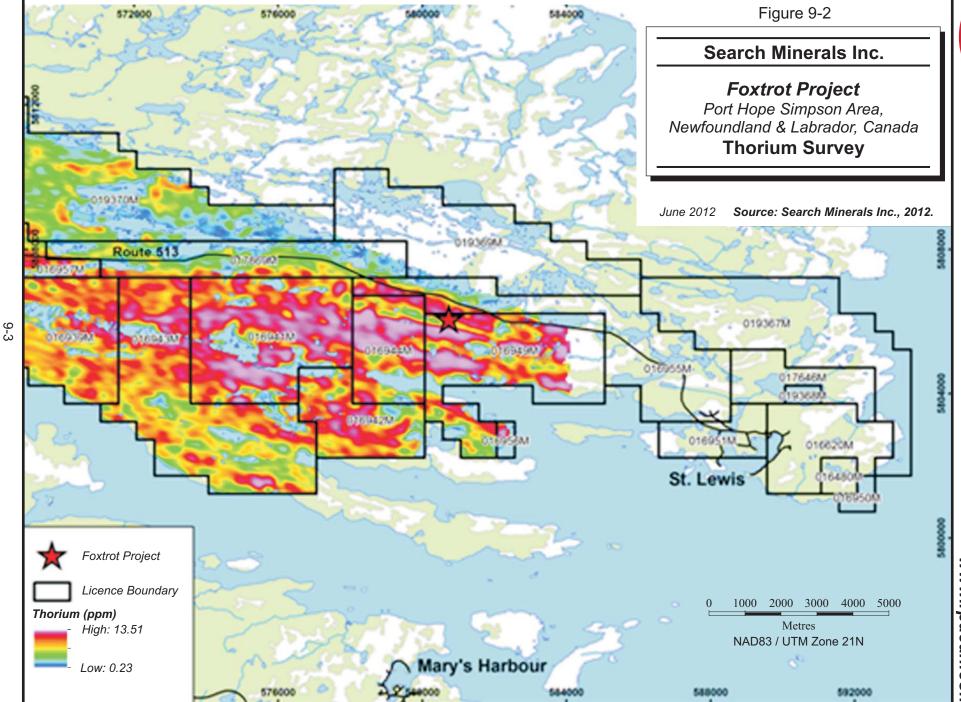


### 9 EXPLORATION

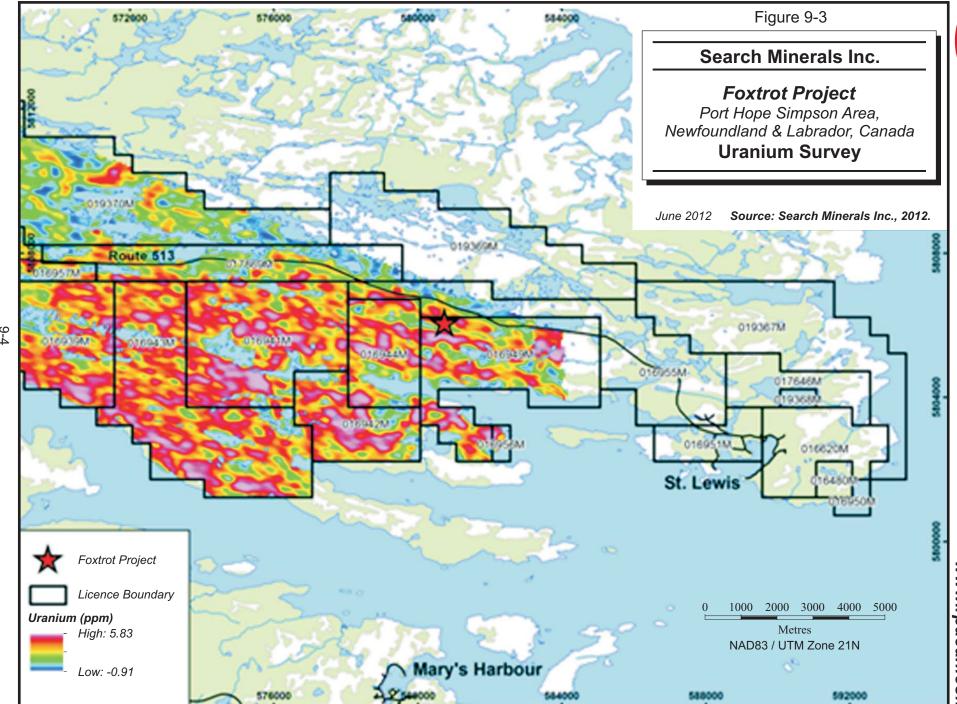
Search Minerals began exploration on the Fox Harbour property within the PHS in the winter of 2009, conducting an Aeroquest airborne radiometric and magnetometer survey (Figures 9-1, 9-2 and 9-3). Following this survey, anomalous areas of interest were outlined, prioritized and ground-checked during the start of the 2010 field season. Within the Fox Harbour property, the Foxtrot Project was the highest priority due to its elevated radiometric and magnetometer values. Exploration in 2010 consisted of prospecting, mapping, lithogeochemical grab sampling, clearing, hand trenching, channel sampling with a portable circular saw and diamond drilling. This exploration program was conducted across the entire Fox Harbour volcanic belt, with the main area of focus being the Foxtrot Project.

Search Minerals commenced a Phase I exploration drill program at Foxtrot Project in Q4 2010. The Phase I drill program consisted of 23 diamond drill holes (DDH) totalling 3,955 m to a depth of 100 m and along two kilometres of strike. A Phase II exploration drill program was completed in Q3 2011 and consisted of 20 DDH's totalling 4,083 m to a depth of 200 m along a 500 m strike. The Mineral Resource estimate in this Technical Report is based on Phase I and II drilling.

A Phase III exploration drill program was completed in Q1 2012 and consisted of 29 DDH's totalling 10,896 m to a depth of 450 m along a 600 m strike. The drilling area focused on the main "thicker mineralization" of the project, which is approximately 100 m in true width. Phase III data is not included in the resource estimate used in this PEA because it was completed after the cut-off date for the resource.



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### **EXPLORATION POTENTIAL**

Exploration in the Fox Harbour volcanic belt and in particular the Foxtrot Project area revealed highly anomalous REE mineralization associated with magnetic/radiometric anomalies in felsic volcanic rocks. The Phase I exploration drill program intersected mineralization in all holes along a two kilometre strike length. The Phase II and Phase III exploration drill programs were focused on a 500 m zone that showed the highest grades and thickest mineralized units. All holes drilled to date have intersected the mineralized units.

Potential to expand the resource exists both at depth and along strike. Including the drill results from Phase III, the mineralization is open at depth and poorly known along strike outside the 500 m zone. The next exploration priority at the Foxtrot Project is to drill along strike and at depth to define the extent of the mineralization and improve quality and size of the Mineral Resource estimate.

Similar mineralized units, associated with magnetic/radiometric anomalies, occur throughout the three felsic volcanic bands mapped in the Fox Harbour area. Several of these have been the focus of exploration activity in late 2011. Search Minerals announced the discovery of the Foxy Lady and Fox Pond Prospects, located east of the Foxtrot Project in felsic volcanic rocks, in March 2012. The new prospects display similar mineralogy, host rocks, and grades as those found at Foxtrot.



## 10 DRILLING

### DRILLING BY SEARCH MINERALS

Springdale Forest Resources of Springdale, Newfoundland were awarded the contract to complete the 3,800 m drill program in the late fall of 2010 and early winter of 2011. An excavator assisted with the drill moves for this program, and a Muskeg tractor transported the drillers, fuel and core.

Logan Drilling Group of Stewiacke, Nova Scotia was awarded the contract to complete the Phase II drill program totalling 4,083 m in the summer of 2011. A skidder was used in transporting and moving the drill, along with fuel, and core.

Drill hole collar positions were determined by Search Mineral's senior geological personnel and were located in the field by a Search Minerals geologist. Drill holes were initially plotted using ArcGIS, and collar positions staked using a handheld GPS unit. All drill holes in the Foxtrot Project were surveyed after drilling had been completed to within ±0.60 m GPS positional accuracy, and 0.2° to 1.0° azimuth accuracy. Coordinates were recorded in UTM format according to the NAD83 datum, and elevations were recorded in meters above sea level.

All drill holes were drilled at an angle to the horizontal; the collar azimuth and dip are planned and checked by a Search Minerals geologist. The drill hole was set with an extended foresight from the drill head, and the azimuth of this line direction was measured with a Brunton or Silva type compass. The drill hole collar dip was set and measured with an inclinometer on the drill rods at the drill head.

No serious deviation problems have been encountered in the drilling to date, with most holes deviating less than 5° to 10° per 100 m from both azimuth and dip. Due to the steeply dipping mineralized zone, this did not affect true thickness calculations.

As mentioned in the previous section the Phase III exploration drill program was completed in Q1 2012. Phase III data is not included in the resource estimate used in this PEA because it was completed after the cut-off date for the resource. The Phase III drilling follows the same procedures as Phase I and Phase II.



Figure 10-1 displays the diamond drill hole locations from Phases I and II. Table 10-1 and 10-2 presents significant intervals for key rare earth metals and key rare earth oxides, respectively. Figure 10-2 displays diamond drill hole locations for Phase III.

TABLE 10-1 SIGNIFICANT INTERVALS, AVERAGES FOR KEY METALS
Search Minerals Inc. – Foxtrot Project

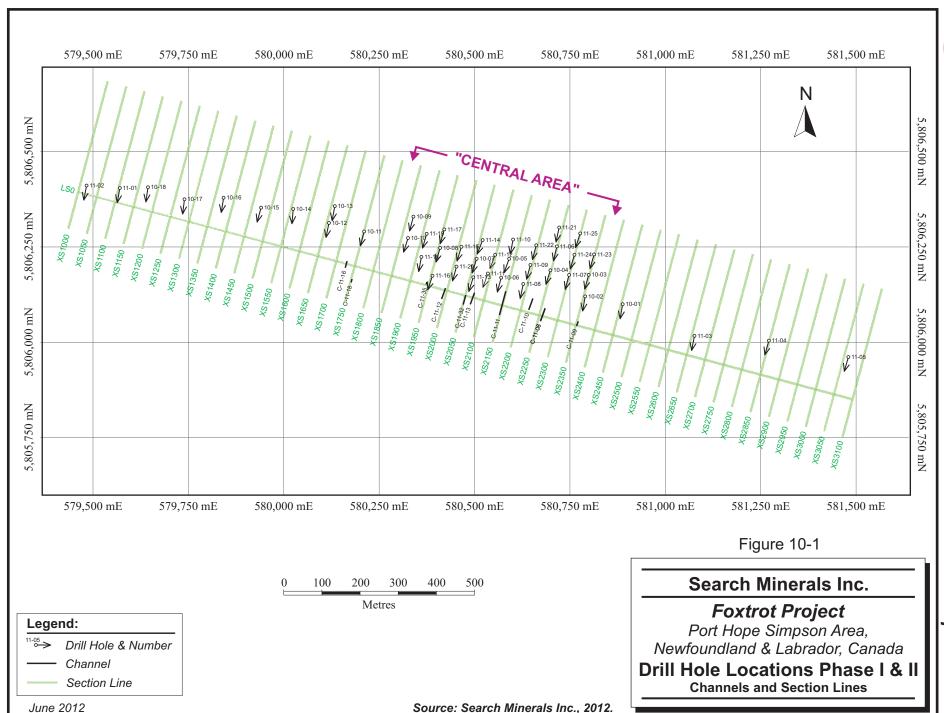
Hole	Length (m)	From (m)	To (m)	Dy (ppm)	Nd (ppm)	Y (ppm)	HREE+Y (%)	TREE+Y (%)
FT-10-04	21.2	123.5	144.7	215	1,639	1,210	0.20	0.99
FT-10-05	11.5	126.4	137.9	217	1,721	1,211	0.20	1.01
FT-10-06	9.9	63	72.9	233	1,795	1,296	0.22	1.09
FT-10-07	12.9	108.3	121.3	203	1,635	1,151	0.19	1.03
FT-10-08	7.6	90.3	97.8	245	1,766	1,312	0.22	1.04
FT-10-11	8.5	96.8	105.3	202	1,756	1,188	0.19	1.09
FT-11-06	21.4	196.9	218.3	221	1,733	1,177	0.20	1.03
FT-11-07	11.5	127.2	138.7	208	1,454	1,141	0.19	0.90
FT-11-08	14.9	60.7	75.6	234	1,647	1,254	0.21	1.02
FT-11-09	25	124.6	149.6	207	1,691	1,149	0.19	1.04
FT-11-10	30.2	181.1	211.3	201	1,507	1,066	0.18	0.92
FT-11-11	18.7	73.6	92.3	230	1,799	1,350	0.22	1.11
FT-11-12	10.3	137	147.3	204	1,729	1,160	0.19	1.06
FT-11-13	24.2	46.3	70.5	212	1,647	1,251	0.20	1.07
FT-11-14	10.8	167.8	178.6	206	1,803	1,222	0.20	1.13
FT-11-16	7.5	21.9	29.4	230	1,921	1,306	0.22	1.17
FT-11-17	10	148	158	228	1,577	1,159	0.20	0.97
FT-11-20	7.1	70.3	77.4	235	1,862	1,330	0.22	1.18
FT-11-21	12	250.7	262.7	240	1,897	1,342	0.22	1.14
FT-11-22	17	179.3	196.3	235	1,786	1,379	0.22	1.11
FT-11-23	15.8	196.6	212.3	212	1,642	1,178	0.20	0.98
FT-11-24	15.1	189.2	204.3	212	1,595	1,141	0.19	0.97
FT-11-25	26.1	243.6	269.6	205	1,526	1,200	0.20	0.95



TABLE 10-2 SIGNIFICANT INTERVALS, AVERAGES FOR KEY OXIDES
Search Minerals Inc. – Foxtrot Project

Hole	Length (m)	From (m)	To (m)	Dy <sub>2</sub> O <sub>3</sub> (ppm)	Nd <sub>2</sub> O <sub>3</sub> (ppm)	Y <sub>2</sub> O <sub>3</sub> (ppm)	HREO+Y (%)	TREO+Y (%)
FT-10-04	21.2	123.5	144.7	248	1,918	1,536	0.24	1.19
FT-10-05	11.5	126.4	137.9	249	2,014	1,538	0.24	1.22
FT-10-06	9.9	63	72.9	268	2,100	1,646	0.26	1.32
FT-10-07	12.9	108.3	121.3	234	1,913	1,461	0.23	1.24
FT-10-08	7.6	90.3	97.8	281	2,066	1,666	0.27	1.25
FT-10-11	8.5	96.8	105.3	232	2,055	1,508	0.24	1.31
FT-11-06	21.4	196.9	218.3	254	2,027	1,495	0.24	1.24
FT-11-07	11.5	127.2	138.7	239	1,701	1,450	0.23	1.08
FT-11-08	14.9	60.7	75.6	269	1,927	1,592	0.26	1.22
FT-11-09	25	124.6	149.6	238	1,978	1,460	0.23	1.25
FT-11-10	30.2	181.1	211.3	231	1,763	1,354	0.22	1.11
FT-11-11	18.7	73.6	92.3	264	2,105	1,714	0.27	1.34
FT-11-12	10.3	137	147.3	235	2,023	1,473	0.23	1.27
FT-11-13	24.2	46.3	70.5	244	1,927	1,589	0.25	1.28
FT-11-14	10.8	167.8	178.6	237	2,110	1,552	0.24	1.36
FT-11-16	7.5	21.9	29.4	265	2,248	1,659	0.26	1.41
FT-11-17	10	148	158	263	1,846	1,471	0.24	1.16
FT-11-20	7.1	70.3	77.4	270	2,179	1,689	0.27	1.42
FT-11-21	12	250.7	262.7	276	2,220	1,704	0.27	1.37
FT-11-22	17	179.3	196.3	270	2,089	1,751	0.27	1.33
FT-11-23	15.8	196.6	212.3	244	1,921	1,496	0.24	1.18
FT-11-24	15.1	189.2	204.3	244	1,866	1,450	0.24	1.17
FT-11-25	26.1	243.6	269.6	236	1,786	1,524	0.24	1.14







# 11 SAMPLE PREPARATION, ANALYSES AND SECURITY

The two sampling methods used at the Foxtrot Project during the 2010 and 2011 sampling programs were diamond drilling and channel sampling. All sample preparation and core logging were done at the field house, which is located in Port Hope Simpson, approximately 45 minutes by truck from the Foxtrot Project field area. Drilling, core logging, and sampling operations were supervised by Randy Miller, P.Geo., VP of Exploration for Search Minerals.

All drilling, logging, and sampling procedures were reviewed by Benchmark Six and RPA during their site visit. The quality assurance/quality control (QA/QC) protocols, procedures for ensuring the security of drill core and channel samples, integrity of chain-of-custody for samples, and accuracy of laboratory analyses all met normal industry practices.

### **DIAMOND DRILL CORE**

Diamond drill core was placed into standard wooden core boxes and stacked at the drill site. Core boxes were transported by pick-up truck from the field area to the field house at least once a day where they were organized onto racks in the core shed. Geologists log the core and mark assay sample intervals with wax crayon. Intervals averaged one metre but were longer or shorter, at the discretion of the geologist, depending on the structural and lithological features present. Drill core was logged manually and the logs were subsequently entered into a digital database by Search Minerals staff. All original paper drill logs are kept on file.

The core was split by technicians according to the marked assay intervals; all splitting was done using a circular saw with a diamond tip blade. One half of the core was placed in a sample bag and sent to the lab for chemical analyses and the other half remains in the core box for future reference. For each interval, one sample tag was placed in the sample bag and another sample tag was stapled to the bottom of the core box, under the core. After the core had been split and sampled, the remaining core was placed back into core boxes and kept in the core shed. All stored core boxes are affixed with an



aluminum plate indicating the hole ID and the interval contained within. A list was made of all sample numbers and their corresponding hole ID, and from-to depths.

The drill rig used during the 2010 sampling program was a Dura-lite 500 and was operated by Springdale Forest Resources. The 2011 sampling program made use of two different drill rigs: a Longyear Super 38 that was fully enclosed and mounted on skids as well as a Longyear Fly 38 that was not enclosed, also mounted on skids and was suitable to be moved by helicopter. These two drill rigs were operated by Logan Drilling Group. All core drilled during the 2010 and 2011 sampling programs was NQ size.

### CHANNEL SAMPLES

Channel samples were taken from surface outcrop, perpendicular to the strike of the mineralization. A circular saw with a diamond tip blade was used to cut the rock into approximately 3-cm thick by 6-cm wide slabs that were then put into channel boxes and transported back to the field house. These samples were logged, cut, and sampled according to the same procedure as the diamond drill core, described above.

### SAMPLE ANALYSES

Sample bags were transported by Search Minerals staff to Activation Laboratories (Actlabs) in Goose Bay, Labrador, where they were crushed to a minus 10 mesh, riffle split to obtain a representative sample, pulverized to at least 95% passing minus 150 mesh and then sent to Actlabs' Ancaster, Ontario location for analysis. Samples were analyzed using a lithium metaborate/tetraborate fusion with subsequent analysis by inductively coupled plasma (ICP) and ICP/MS (mass spectroscopy).

Actlabs is an independent lab accredited according to both the ISO 17025 standard for testing and calibration laboratories, and the CAN-P-1579 standard, specific to mineral analysis laboratories. In 2007, Actlabs became accredited to NELAP, an American laboratory accreditation program specifically for the environmental sector.



### QUALITY ASSURANCE AND QUALITY CONTROL

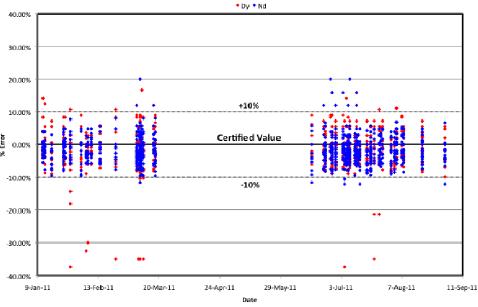
### **ACTLABS INTERNAL QA/QC**

The resource estimate included in this report incorporates analytical results from 69 batches that were submitted to Actlabs between November 2010 and August 2011. With each batch, Actlabs used three types of samples to monitor the accuracy and precision of their results: standards, blanks, and duplicates.

The standards allow the lab to monitor the accuracy of their results. There were a total of 22 different standards that were used to test the accuracy of the REE data and no one standard alone covered the complete set of potentially economic elements.

Among the economically viable elements, dysprosium is one of the more important heavy REEs and neodymium is one of the more important light REEs. Figure 11-1 shows the percent error of the dysprosium and neodymium in the various standards according to date of the analysis, a proxy commonly used for batch.

FIGURE 11-1 SELECTED RESULTS FOR ACTLABS' INTERNAL QUALITY CONTROL CHART FOR STANDARDS



In all 69 batches, 97.2% of internal standards fall with ±10% error of the original sample when the dysprosium and neodymium data are isolated. While this is generally accepted



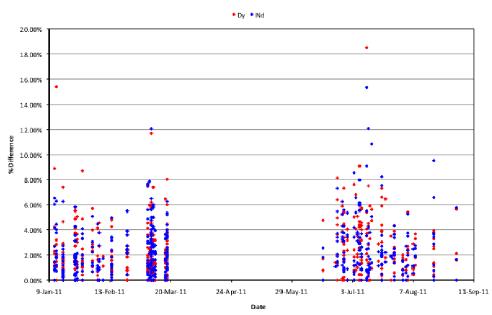
as a good result, it is recommended that closer attention be paid to the labs internal standards, and batches that do not meet pre-set protocols should be re-assayed.

Blank control samples allow the lab to monitor cross contamination between the samples. While contamination can occur during the sample preparation and the analysis stage, these blank control samples were limited to monitoring only the analysis stage.

It is normal industry practice to reject any batch whose results are more than five times the detection limit. Although Search Minerals does not have any response protocol in place, of the 104 blanks tested, no blank control sample had more than twice the detection limit. It is accepted that cross contamination was not an issue at Foxtrot Project.

Duplicates allow the lab to monitor precision of their analytical results. As with standards, it is normal industry practice to accept batches if 95% of duplicate samples fall within  $\pm 10\%$  of their average. Although Search Minerals does not have any response protocol in place, in all 69 batches 98.8% of internal duplicate assays for dysprosium and neodymium fall within the  $\pm 10\%$  band. The following graph shows the percent difference of duplicate analyses for dysprosium and neodymium.

FIGURE 11-2 SELECTED RESULTS OF ACTLABS' INTERNAL QUALITY CONTROL FOR DUPLICATES





### SEARCH MINERALS EXTERNAL QA/QC

In addition to Actlabs' internal QA/QC efforts, the reliability of the analytical data was also monitored by Search Mineral's own external QA/QC program, using only standards and duplicates.

Search Minerals used two ore-grade standards and one standard chosen to effectively act as a blank. The two ore-grade standards include one from a eudialyte-rich zone in one of Search Minerals' other REE projects in Labrador, a peralkaline complex known as 'Red Wine' (RW), and one from a mineralized felsic volcanic gneiss unit found in Fox Harbour (FHG). The third standard, the very low grade standard, is from an anorthosite unit also found in Port Hope Simpson area (FHA).

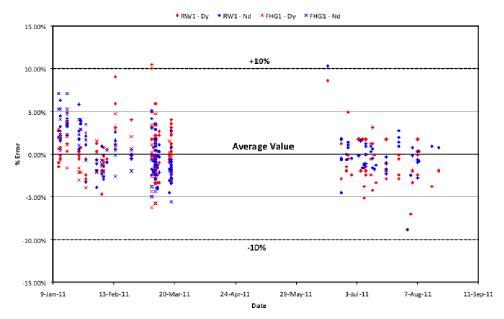
The material for each standard was delivered to Actlabs in bulk and they were instructed to crush, pulverize, homogenize, store and insert pulp samples into the sample sequence during sample preparation. Throughout the 2010 drilling program, laboratory staff inserted one pulp standard every 50 samples but this procedure was changed in 2011 to include at least one standard with every batch to account for smaller batches of less than 50 samples where standards were previously not being included.

Rather than using certified reference material, Search Minerals used material sourced locally for which no certified value had been established by round-robin analyses from multiple laboratories. In this case, the average of all available results was used as the reference value and percent error was calculated.

The vast majority of results for the RW and FHG standards plot within the ±10% range. The results for FHA, the very low-grade standard, were not within ±10% of the average value but rather ranged from -50% to 150%, which is an acceptable range for a blank control sample. Due to the nature of the sample used, the values for each of the elements were very close to detection limit. The following graph shows the percent error of dysprosium and neodymium for the RW and FHG standards only.







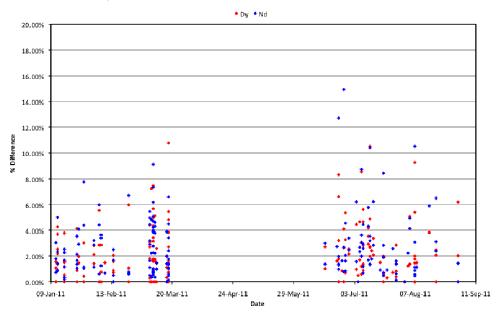
RPA recommends that Search Minerals include certified reference materials in their external QA/QC program.

Search Mineral's implementation of duplicate samples as part of their QA/QC program was similar to that of the standards. Actlabs was instructed to duplicate every 25<sup>th</sup> sample and report the results as the original sample number appended with a 'B' in the Certificate of Analysis.

In all, there were 167 samples duplicated in the 69 batches. Of these, only six samples, or less than 4%, did not fall within a  $\pm 10\%$  band. The following graph shows the percent difference of dysprosium and neodymium of the sample duplicates.



FIGURE 11-4 SELECTED RESULTS FOR SEARCH MINERAL'S EXTERNAL QUALITY CONTROL FOR DUPLICATES



### **SAMPLE SECURITY**

Search Minerals employs strict security protocols with the handling of their samples. Core is transported by truck only, both from the drill site to the field house and from the field house to the lab in Goose Bay. The core is stored in the core shack, a detached structure with doors and locks, and is organized carefully facilitating accessibility to all holes. During logging, cutting, and sampling, drill core is always under the supervision of full-time Search Minerals staff.

In the opinion of RPA, the procedures and protocols for sampling, sample preparation, analysis and security are all good, always at least as sound as the procedures used elsewhere and, in some aspects, at the level of industry best practice.



### 12 DATA VERIFICATION

RPA reviewed the resource database that formed the basis for the Resource Estimate presented in this Technical Report. This includes results from the quality QA/QC program and assay certificates for drill hole samples to a cut-off date of September 30, 2011. In the opinion of RPA no limitations on or failure to conduct data verifications occurred.

### SITE VISIT

A site visit was conducted by Jacques Gauthier, Principal Mining Engineer for RPA, and Rick Breger, Director of Operations for Benchmark Six Inc., on October 27, 2011. While on site, both the field house and the Property were visited.

The field house visit consisted of a complete tour of the premises, including the field office, the core logging shack, the core cutting shack, and the core storage facilities. During the visit, logging, cutting and sampling procedures were observed first hand.

The Property visit included a tour of the Foxtrot Project. During the time of the visit, the drill on site was being repaired so no drilling was observed. The Property visit included first hand observations of surface mineralization, including the location of the trenching, and old drill hole collars, specifically FT-10-04, FT-11-10, FT-11-25, and FT-11-31. All old collars are well marked with drill casing and capped with an aluminum tag marked with the hole ID. In addition, the power station and a port that could potentially service the Property were observed.

Both RPA and Benchmark Six concluded that Search Minerals staff conducted their exploration and drill activities to a standard that met or exceeded normal industry practices.



# FIGURE 12-1 PHOTOGRAPH OF THE TRENCHING DONE DURING THE 2011 EXPLORATION PROGRAM



FIGURE 12-2 PHOTOGRAPH OF THE DRILL ON SITE





### DATABASE VERIFICATION

Benchmark Six verified that the drill hole database matched the original Actlabs assay certificates. This was done by manually checking 10% of the data, across the range of low, medium and high-grade data according to dysprosium values.

No errors were found and the database is considered to be reliable and adequate for the purposes of resource estimation.

### **CHECK SAMPLES**

During the site visit, Rick Breger took 28 check samples. These samples were taken in order to check both the accuracy of the REE analyses performed by Actlabs and to determine the density of each lithological unit for use in the resource estimate. Of the check samples, 22 were used to check accuracy, and all 28 samples were used to determine density. Table 12-1 shows a detailed summary of the check samples analyzed by SGS, including the 22 drill core samples that were taken to check REE accuracy, for which there are dysprosium and neodymium grade comparisons shown, as well as the six channel samples that were taken for the purposes of determining the density of each lithological unit. The channel samples were not analyzed geochemically and the density of these samples is shown in Table 12-2.



# TABLE 12-1 SUMMARY OF ORIGINAL AND CHECK SAMPLES TAKEN BY BENCHMARK SIX AND SUBMITTED TO SGS

**Search Minerals Inc. – Foxtrot Project** 

Check Sample ID	Hole ID	Original Sample ID	Sample Type	Original Dy (ppm)	Check Dy (ppm)	Original Nd (ppm)	Check Nd (ppm)
MP-11-056	FT-11-12	509652	Drill Core	2.3	2.33	7.9	7.6
MP-11-057	FT-10-15	458142	Drill Core	3.4	3.04	8.9	7.2
MP-11-058	FT-10-17	458361	Drill Core	5.8	6.08	60.6	60.8
MP-11-059	FT-10-13	457844	Drill Core	4.7	4.38	15.9	13.5
MP-11-060	FT-10-02	455416	Drill Core	6.4	7.15	34.6	34.6
MP-11-061	FT-10-18	460354	Drill Core	7.2	6.44	68.4	61.4
MP-11-062	FT-10-09	456856	Drill Core	6.8	6.73	63.7	65
MP-11-063	FT-10-16	460326	Drill Core	8.7	8.71	39.8	37
MP-11-064	FT-10-02	455444	Drill Core	10	9.78	66.3	60.2
MP-11-065	FT-11-22	511521	Drill Core	264	236	1900	1700
MP-11-066	FT-10-06	456309	Drill Core	35.1	34.5	255	243
MP-11-067	FT-10-03	455669	Drill Core	25.6	30.6	127	177
MP-11-068	FT-11-04	460887	Drill Core	7.8	7.7	63.9	57.4
MP-11-069	FT-10-03	455679	Drill Core	40.5	72	241	457
MP-11-070	FT-10-07	456542	Drill Core	12.6	11.4	50.3	49.2
MP-11-071	FT-11-02	460679	Drill Core	360	360	464	419
MP-11-072	FT-11-19	510833	Drill Core	78.3	58.4	538	434
MP-11-073	FT-11-19	510834	Drill Core	198	190	1510	1460
MP-11-074	FT-10-10	457065	Drill Core	30.3	31.9	130	132
MP-11-075	FT-10-09	456941	Drill Core	50	52.8	294	296
MP-11-076	FT-10-09	456889	Drill Core	24.8	24.7	93.4	82.7
MP-11-077	FT-10-17	458242	Drill Core	130	106	440	353
MP-11-078	FTC-11-03	507719	Channel				
MP-11-079	FTC-11-03	507709	Channel				
MP-11-080	FTC-11-04	507818	Channel				
MP-11-081	FTC-11-27	507965	Channel				
MP-11-082	FTC-11-27	507967	Channel				
MP-11-083	FTC-11-04	507844	Channel				



The following table summarizes the results of the bulk density measurements done by SGS for the three lithological units found on the Foxtrot Project.

TABLE 12-2 SUMMARY OF BULK DENSITY MEASUREMENTS FROM CHECK SAMPLES SUBMITTED BY BENCHMARK SIX TO SGS
Search Minerals Inc. – Foxtrot Project

Check Sample ID	Hole ID	Original Sample ID	Lithological Unit	Bulk Density (g/ml)
MP-11-056	FT-11-12	509652	Mafic	3.1
MP-11-057	FT-10-15	458142	Mafic	3.06
MP-11-058	FT-10-17	458361	Mafic	2.56
MP-11-059	FT-10-13	457844	Mafic	2.95
MP-11-060	FT-10-02	455416	Mafic	2.86
MP-11-061	FT-10-18	460354	Augen	2.67
MP-11-062	FT-10-09	456856	Augen	2.64
MP-11-063	FT-10-16	460326	Mafic	3.09
MP-11-064	FT-10-02	455444	Mafic	2.72
MP-11-065	FT-11-22	511521	Felsic	2.77
MP-11-066	FT-10-06	456309	Felsic	2.66
MP-11-067	FT-10-03	455669	Felsic	2.73
MP-11-068	FT-11-04	460887	Mafic	2.67
MP-11-069	FT-10-03	455679	Felsic	2.81
MP-11-070	FT-10-07	456542	Felsic	3.01
MP-11-071	FT-11-02	460679	Felsic	2.75
MP-11-072	FT-11-19	510833	Felsic	2.51
MP-11-073	FT-11-19	510834	Felsic	2.79
MP-11-074	FT-10-10	457065	Felsic	2.52
MP-11-075	FT-10-09	456941	Felsic	2.61
MP-11-076	FT-10-09	456889	Felsic	2.7
MP-11-077	FT-10-17	458242	Felsic	2.68
MP-11-078	FTC-11-03	507719	Augen	2.28
MP-11-079	FTC-11-03	507709	Mafic	2.84
MP-11-080	FTC-11-04	507818	Mafic	2.85
MP-11-081	FTC-11-27	507965	Augen	2.64
MP-11-082	FTC-11-27	507967	Mafic	3.01
MP-11-083	FTC-11-04	507844	Augen	2.41

### INDEPENDENT THIRD PARTY QA/QC

As a further supplement to the quality control measures taken by both Actlabs and Search Minerals, Benchmark Six collected and submitted 30 samples to SGS in Toronto. This included 22 REE check samples, six density check samples, and two quality control samples. SGS uses a quality management system that meets, at a minimum, the requirements for both ISO 9001 and ISO 17025.

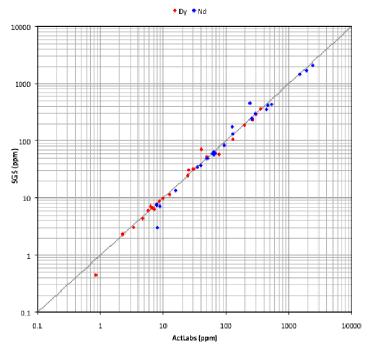
All samples were dried, measured for bulk density prior to being crushed and then pulverized. The REE and quality control check samples were analyzed according to method IMS95A – dissolved using lithium metaborate fusion and analyzed via ICP/MS.



This method was chosen because it replicated the process used by Actlabs. The two quality control samples were Search Minerals pulp standards FHA2 and FHG2. The results of the check samples are shown below in Figure 12-3. The density check samples were used to check the density of the three units at Foxtrot Project – the mineralized felsic material, the mafic material, and the augen gneiss.

The REE check samples were chosen according to the distribution of dysprosium seen on the property, ranging from 2.3 ppm to 360 ppm Dy. This allowed for a complete and thorough check of the low, medium, and high-grade material.

FIGURE 12-3 SELECTED RESULTS FROM THE 24 CHECK SAMPLES SUBMITTED TO SGS TORONTO





# 13 MINERAL PROCESSING AND METALLURGICAL TESTING

## **MINERALOGY STUDIES**

A bulk sample obtained from a Foxtrot Project channel sample was submitted to SGS Minerals Services. The sample was stage crushed to K80 of 150 µm and then screened into two size fractions: +38µm and -38µm for the mineralogical study, and submitted for QEMSCANTM analysis.

The minerals identified in the sample are listed in Table 13-1.

TABLE 13-1 MINERAL LIST AND FORMULAS Search Minerals Inc. – Foxtrot Project

Mineral	Mineral Formula	Mineral	Mineral Formula
Columbite(Fe)	( <u>Fe,Mn)(Nb,Ta</u> ) <sub>2</sub> O <sub>6</sub>	Plagioclase	(NaSi,CaAl)AlSi <sub>2</sub> O <sub>8</sub>
Bastnasite	(Ce, La)CO <sub>3</sub> F	K-Feldspar	KAISi <sub>3</sub> O <sub>8</sub>
Synchysite	Ca(Ce,La)(CO <sub>3</sub> ) <sub>2</sub> F	Biotite	$K(Mg,Fe)_3(AlSi_3O_{10})(OH)_2$
Monazite	(Ce,La,Pr,Nd,Th,Y)PO <sub>4</sub>	Quartz	SiO <sub>2</sub>
Chevkinite	(Ce,La,Ca,Th) <sub>4</sub> (Fe <sup>2+</sup> ,Mg)(Fe <sup>2+</sup> ,Ti,Fe <sup>3+</sup> )- (Ti,Fe <sup>3+</sup> ) <sub>2</sub> (Si <sub>2</sub> O <sub>7</sub> ) <sub>2</sub> O <sub>8</sub>	Muscovites/Clays	KAI <sub>2</sub> (AISi <sub>3</sub> O <sub>10</sub> )(OH) <sub>2</sub>
Fergusonite	(Y,Er,Ce,Fe)NbO <sub>4</sub>	Amphibole/ Pyroxene	(Ca,Na)(Mg,Fe,Al,Ti)(Si,Al) <sub>2</sub> O <sub>6</sub>
Allanite	$(Ca,Ce)_2(Fe^2,Fe^{3+})Al_2O-(SiO_4)(Si_2O_7)(OH)$	Carbonates	CaCO <sub>3</sub>
Zircon	ZrSiO <sub>4</sub>	Fluorite	CaF <sub>2</sub>
Apatite	$(Ca,Ce,Y)_5(PO_4,SiO_4)_3(F,CI,OH)$	Hematite Ilmenite Magnetite	$Fe_2O_3$ $FeTiO_3$ $Fe_3O_4$

## MINERAL ABUNDANCE

Figure 13-1 illustrates the normalized mass % of the REE minerals (excluding zircon). It is apparent that allanite is the primary REE phase. The sample is dominated by quartz (35.8%) and K-feldspar (21.0%), moderate amounts of amphibole/pyroxene (13.7%), plagioclase (12.3%), minor Fe-oxides (4.4%), biotite (3.9%) and muscovite/clays (1.6%), and trace amounts of other silicates, carbonates, fluorite, other oxides and sulphides. REE-Zr minerals include mainly allanite (2.6%), zircon (2.5%), chevkinite (0.3%), fergusonite (0.2%), bastnasite/synchysite (0.1%), monazite (0.1%) and rare columbite.



Most of the allanite (2.2%) occurs in the +38  $\mu$ m, but most of zircon (1.5%) in the -38  $\mu$ m fraction.

## **GRAIN SIZE DISTRIBUTION**

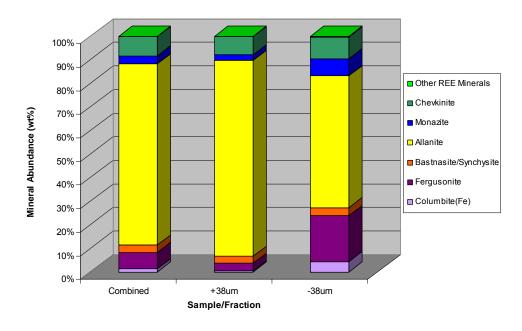
Figure 13-2 summarizes the  $D_{50}$  or 50% passing value from the cumulative grain size distribution of the fergusonite, bastnasite/synchysite, allanite, monazite, chevkinite, zircon, quartz/feldspars, muscovite, other silicates, oxides and overall particle size distribution (PSD) for the Fox HBR Aug-11 sample. The approximate  $D_{50}$  values are as follows:

- fergusonite 22 μm
- bastnasite/synchysite 51 μm
- allanite 65 µm
- monazite 24 µm
- chevkinite 53 μm
- zircon 24 μm

- quartz/feldspars 98 μm
- muscovite 24 µm
- other silicates 83 µm
- oxides 141 μm
- overall particle 98 μm

The grain size data indicates that it should be possible to liberate the REE minerals from the barren gangue minerals using a moderate grind size.

FIGURE 13-1 NORMALIZED MINERAL ABUNDANCE OF REE MINERALS





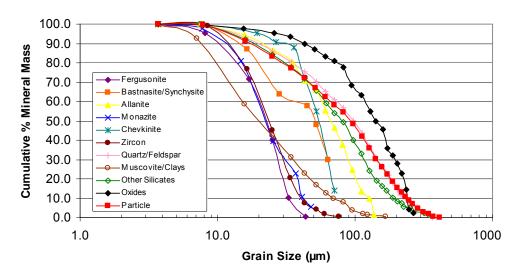


FIGURE 13-2 CUMULATIVE GRAIN SIZE DISTRIBUTION

## MINERAL CHEMISTRY

Electron microprobe analyses (EMPA) were conducted on chevkinite, allanite, fergusonite, bastnasite and synchysite, zircon and an undefined Si/Y/Ca REE phase.

- Allanite averages Ce 11.07 wt%, La 5.18 wt% and Nd 3.66 wt%, and minor Dy 0.40 wt%, Pr 0.92 wt%, Sm 0.24 wt%, Th 0.18% and Y 0.30 wt%.
- Fergusonite carries both, but mainly HREE (heavy rare earth elements) and less LREE (light rare earth elements). It averages Y 17.76%, Nb 29.20%, and minor Dy 3.63%, Gd 3.42%, Er 2.17%, Nd 1.76%, Ce 1.47%, Yb 1.27%, Sm 1.16%, La 0.44%, Ho 0.85%, Pr 0.25%, Tb 0.68%, Tm 0.38%, U 0.37 % and Th 0.61%.
- A Si-Y-Ca phase consists of Y 14.45%, Nd 8.07%, Ce 7.70%, Gd 3.99%, Dy 3.22%, Sm 2.94%, La 2.01%, Pr 1.42%, Yb 1.01% and Tb 0.58%, Tm 0.54% and Th 0.27%. This phase is tentatively identified as a Y-britholite.
- Bastnasite/Synchysite consists of, in average, Ce 27.42%, La 15.27%, Nd 10.92%, Pr 3.06%, Sm 1.44%, Gd 0.90%, Tm 0.33%, Dy 0.28%, Tb 0.24%, Yb 0.18%, Th 0.17%, and Y 0.68%.
- Chevkinite consists of Ce 16.74%, La 6.84%, Nd 6.69%, Pr 1.87%, Nb 1.28%, Gd 0.73%, Dy 0.68%, Sm 0.98%, Yb 0.15%, Th 0.56% and Y 1.72%.
- Although based on a limited number of analyses, there are two populations of zircon grains, with Y-bearing and Y-barren. Y ranges from nil to 0.66% and averages 0.15%.



## LIBERATION AND ASSOCIATION

The liberation and association characteristics of allanite, fergusonite, bastnasite/synchysite, monazite, chevkinite and zircon were examined.

- Free and liberated allanite account for 66.8%. The main association of allanite is as complex particles (25.8%), and minor middlings with zircon (3.8%) and quartz/feldspars (1.6%), and trace associations (<1%) with other minerals. Free and liberated allanite increases from 59.1% to 86.0% with decreasing size, while complex particles decrease from 33.4% in the +38 μm to 6.7% in the -38 μm fraction.
- Free and liberated fergusonite accounts for 31.4%. The main association of fergusonite is as complex particles (30.8%), followed by middlings with zircon (21.4%), quartz/feldspars (11.4%), and less with allanite (1.6%) and other silicates (1.5%), while other associations are insignificant (<1%). Liberation increases from 12.5% in the +38 μm fraction to 42.6% in the -38 μm fraction. Complex particles decrease from 48.5% to 20.3%, with quartz/feldspars from 26.2% to 2.6%, but those with zircon increase from 8.9% to 28.8%.

## BENEFICIATION OF FOXTROT SAMPLE

Three beneficiation techniques were studied in order to concentrate the REE in the Foxtrot sample, including Wilfley tabling, magnetic separation, and flotation. The Wilfley tabling was used to test amenability to gravity concentration. Low Intensity Magnetic Separation (LIMS) was used to reject magnetite from the Wilfley concentrates. Flotation was tested both as a primary method of concentration for the Foxtrot sample and as a scavenging method to recover additional REE from the Wilfley tails. The work was preliminary in nature.

#### GRAVITY CONCENTRATION WITH THE WILFLEY TABLE AND MAGNETIC SEPARATION

A 100 kg charge was stage ground with the closing screen size of 105  $\mu$ m. The -105  $\mu$ m fraction was screened on 75  $\mu$ m, and 38  $\mu$ m screens to make three fractions. The +75  $\mu$ m fraction was tabled and the tails re-passed. The test generated three fractions: Concentrate, Scavenger Middlings, Scavenger Tail. The +38  $\mu$ m fraction was tabled and the tails repassed. The test generated three fractions: Conc, Scav Mids, Scav Tail. The -38  $\mu$ m fraction was passed through the cyclone to eliminate unnecessary slimes on the table. The cyclone overflow was filtered. The cyclone underflow was passed over the



Wilfley Table and the tail was re-passed. The Concentrate, Scavenger Middlings and Scavenger Tailings were submitted for assay. All the table concentrates were passed through LIMS to separate mainly magnetite. The flowsheet is shown in Figure 13-3.

Table 13-2 summarizes the results of the gravity and magnetic separation. It is possible to recover 71.4% of the Ce, 70.7% of the Nd and 70.7% of the Y into a concentrate containing 22.3% of the original mass. Flotation was also examined to enhance the overall recoveries.

#### **FLOTATION SEPARATION**

Flotation testing was conducted on a head sample. The flotation was performed as a rougher test with five stages of rougher flotation. Appropriate flotation reagents and test conditions were supplied by SGS for recovery of allanite and fergusonite. The feed particle size was 80% passing 150 µm. The flotation test results are shown in Table 13-3. Flotation by itself produced a concentrate containing 70.5% of the Ce, 73.6% of the Nd and 81.7% of the Y in a mass pull of 27.4%. These results are slightly better than the results of the gravity and magnetic separation.

As a last step in the beneficiation testing, the Wilfley table tails (three size fractions) were subjected to flotation to increase the overall recovery of REEs, excluding the cyclone overflow.

The analysis of this concentrate is shown in Table 13-4, along with the associated total recoveries. These results show that conventional beneficiation methods may be used to recover the REE minerals. Additional testwork using more selective beneficiation or incorporation of cleaning steps in the circuit may improve recoveries.



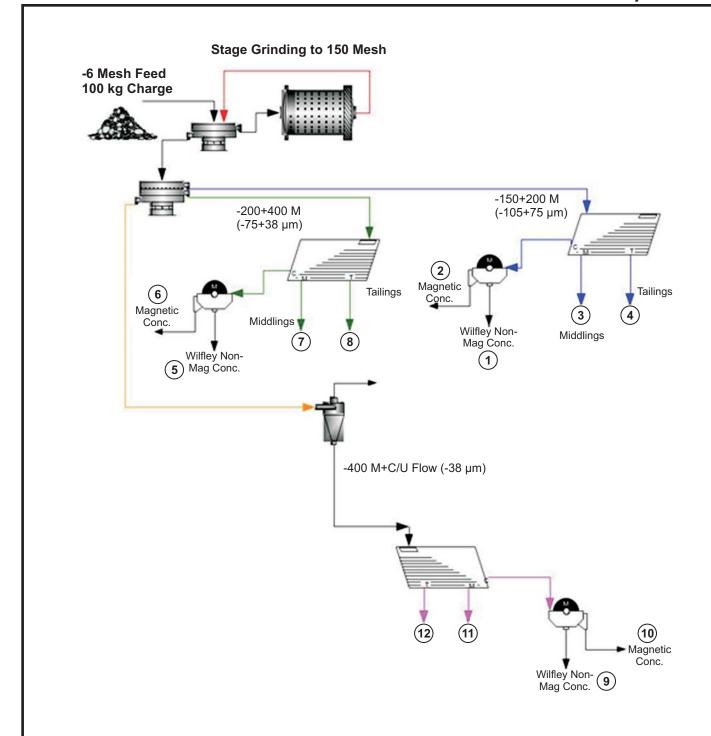


Figure 13-3

## **Search Minerals Inc.**

## Foxtrot Project

Port Hope Simpson Area, Newfoundland & Labrador, Canada

Gravity (Wifley Table) and Magnetic Separation Flowsheet

June 2012 Source: Search Minerals Inc., 2011.



www.rpacan.com

## TABLE 13-2 SUMMARY OF THE BENEFICIATION OF 100 KG SAMPLE OF FOXTROT MATERIAL USING GRAVITY AND MAGNETIC SEPARATION

**Search Minerals Inc. - Foxtrot Project** 

Prod.	Weig	jht				Assay	s, %, g/t							% Dist	ribution			
No.	g	%	CeO <sub>2</sub>	$Nd_2O_3$	$Y_2O_3$	$ZrO_2$	$Nb_2O_5$	SiO <sub>2</sub>	$Al_2O_3$	Fe <sub>2</sub> O <sub>3</sub>	CeO <sub>2</sub>	$Nd_2O_3$	$Y_2O_3$	$ZrO_2$	$Nb_2O_5$	SiO <sub>2</sub>	$AI_2O_3$	Fe <sub>2</sub> O <sub>3</sub>
1	8,713	9.53	1.50	0.58	0.39	2.15	0.24	57.8	3.70	17.3	33.8	32.2	28.5	12.0	23.5	8.12	4.88	14.6
2	1,484	1.62	0.09	0.12	0.10	0.76	0.10	4.43	0.30	97.4	0.35	1.10	1.25	0.72	1.65	0.11	0.07	14.0
3	167	0.18	0.25	0.12	0.10	0.76	0.10	69.9	7.67	11.4	0.11	0.12	0.14	0.08	0.19	0.19	0.19	0.18
4	28,797	31.5	0.05	0.01	0.01	0.57	0.01	76.8	8.50	4.10	3.66	2.13	2.39	10.5	4.58	35.6	37.1	11.5
5	5,082	5.56	1.56	0.57	0.39	3.09	0.31	58.0	4.20	15.4	20.5	18.4	16.6	10.1	17.8	4.75	3.23	7.61
6	917	1.00	0.07	0.03	0.08	0.55	0.03	4.23	0.35	95.7	0.17	0.20	0.58	0.33	0.29	0.06	0.05	8.52
7	329	0.36	0.10	0.03	0.08	0.55	0.03	77.4	8.06	3.78	0.08	0.07	0.21	0.12	0.10	0.41	0.40	0.12
8	17,382	19.0	0.11	0.05	0.05	0.62	0.04	75.3	8.53	5.68	4.97	5.14	7.34	6.93	8.29	21.1	22.5	9.60
9	6,576	7.20	1.00	0.48	0.40	8.37	0.33	61.5	5.44	9.52	17.0	20.0	21.9	35.3	24.1	6.52	5.42	6.08
10	976	1.07	0.12	0.05	0.10	1.10	0.05	5.64	0.48	92.7	0.30	0.31	0.81	0.69	0.54	0.09	0.07	8.79
11	34.3	0.04	0.31	0.13	0.11	3.54	0.09	70.8	8.02	6.14	0.03	0.03	0.03	0.08	0.03	0.04	0.04	0.02
12	12,914	14.1	0.31	0.12	0.09	2.20	0.06	70.8	8.04	7.43	10.3	9.55	9.55	18.2	8.21	14.7	15.7	9.33
13	8,019	8.77	0.42	0.21	0.16	0.97	0.12	63.9	8.54	12.3	8.71	10.7	10.7	4.99	10.7	8.26	10.4	9.59
Calc Head	91,388	100	0.42	0.17	0.13	1.71	0.10	67.9	7.22	11.3	100	100	100	100	100	100	100	100
Dir Head			0.45	0.19	0.16	1.86	0.13	65.2	6.92	11.1								
Concentrate 1+5+9	20,370	22.3	1.35	0.55	0.40	4.39	0.29	59.0	4.39	14.31	71.4	70.7	67.0	57.4	65.4	19.4	13.5	28.3

## TABLE 13-3 FLOTATION TEST RESULT FOR SCOPING ROUGHER TEST Search Minerals Inc. - Foxtrot Project

Prod.	Wei	ght		Assays, %, g/t						% Distribution								
No.	g	%	CeO <sub>2</sub>	$Nd_2O_3$	$Y_2O_3$	$ZrO_2$	$Nb_2O_5$	SiO <sub>2</sub>	$Al_2O_3$	Fe <sub>2</sub> O <sub>3</sub>	CeO <sub>2</sub>	$Nd_2O_3$	$Y_2O_3$	$ZrO_2$	$Nb_2O_5$	SiO <sub>2</sub>	$AI_2O_3$	Fe <sub>2</sub> O <sub>3</sub>
Rougher Conc.	536	27.4	1.14	0.52	0.35	4.71	0.27	46.1	4.66	27.4	70.5	73.6	81.7	73.3	62.7	19.0	18.0	65.8
Float Tails	1,419	72.6	0.18	0.07	0.03	0.65	0.06	74.2	8.04	5.39	29.5	26.4	18.3	26.7	37.3	81.0	82.0	34.2



TABLE 13-4 COMBINED GRAVITY, MAGNETIC SEPARATION AND FLOTATION CONCENTRATE PRODUCT

**Search Minerals Inc. - Foxtrot Project** 

	Units	Concentrate Assay	Recovery (%)
Weight	kg	35.17	-
Mass Pull	%	38.5	-
$Ce_2O_3$	%	0.94	83.0
$Nd_2O_3$	%	0.38	83.0
$Y_2O_3$	%	0.31	83.7
$ZrO_2$	%	3.71	65.9
$Nb_2O_5$	%	0.22	81.8
$La_2O_3$	g/t	3968	86.2
$Pr_6O_{11}$	g/t	1160	86.6
$Sm_2O_3$	g/t	741	84.3
$Eu_2O_3$	g/t	34	83.7
$Gd_2O_3$	g/t	559	82.7
$Tb_2O_3$	g/t	93	82.4
$Dy_2O_3$	g/t	543	81.4
$Ho_2O_3$	g/t	105	81.6
$Er_2O_3$	g/t	297	81.7
$Tm_2O_3$	g/t	42	81.9
$Yb_2O_3$	g/t	249	81.7
$Lu_2O_3$	g/t	37	81.8
$U_3O_8$	g/t	54	83.8
$ThO_2$	g/t	274	86.6

## HYDROMETALLURGICAL EXTRACTION OF REES FROM FOXTROT CONCENTRATE

The gravity concentrate (Table 13-2) and the combined gravity/flotation concentrate (Table 13-4) were subjected to acid leaching or acid baking at 200°C to 250°C followed by water leaching. The results of the testing are summarized in Table 13-5.

TABLE 13-5 HYDROMETALLURGICAL LEACHING STUDIES ON FOXTROT CONCENTRATES
Search Minerals Inc. – Foxtrot Project

Test ID	AL1 grav	AL2 grav	WL-AB1 AB1	WL-AB2 AB2	WL-AB3 AB3	WL-AB4 AB4	WL-AB5 AB5	WL-AB6 AB6	WL-AB7 AB7	WL-AB8 AB8	WL-AB9 AB9
Feed	con	con	calcine								
H2SO4 Addn(kg/t)	1000	1000				1000			1000	750	500
					Extracti	on (%)					
Si	2	4	1	1	1	1	1	1	1	1	1
Al	16	29	15	16	15	17	14	16	16	15	14
Fe	19	35	19	20	35	37	33	32	34	34	33
Mg	15	28	18	19	45	42	44	41	41	38	49
Ca	32	54	36	32	42	45	40	38	36	39	33
Na	1	2	1	2	3	2	3	2	3	3	2
K	15	36	19	5	11	12	11	10	22	11	22
Ti	48	69	75	62	75	74	67	53	59	68	53
Р	87	88	63	60	72	88	57	50	54	74	52
Mn	27	46	30	30	40	43	39	37	40	35	39
Zr	0	1	0	1	0	0	1	0	1	1	1
Nb	5	18	12	4	15	23	9	8	16	16	15
La	95	97	91	89	94	95	92	88	92	93	91
Ce	95	97	91	89	95	96	92	89	93	94	92
Pr	91	96	93	91	95	96	93	89	93	94	92
Nd	93	94	93	91	94	96	93	90	93	94	92
Sm	83	86	93	92	95	95	93	91	93	93	92
Eu	72	79	93	91	94	94	93	91	92	93	92
Gd	70	74	94	92	95	95	95	93	94	94	93
Tb	60	66	94	92	95	95	94	93	93	93	92
Dy	56	61	94	92	94	94	94	92	93	93	92
Ho	51	58	93	90	93	93	93	92	92	92	91
Er	48	54	90	88	91	91	91	89	89	89	89
Tm	46	54	85	84	86	87	86	85	85	85	84
Yb	46	51	78	77	79	80	79	77	77	77	77
Lu	38	45	64	65	65	68	68	66	65	65	64
Υ	62	64	92	91	92	92	92	91	90	91	90
Sc	6	7	2	4	3	3	2	2	2	2	2
U	15	22	56	57	59	62	62	62	62	60	61
Th	85	80	96	95	97	97	96	94	96	97	94

AL = Atmospheric Leach, AB = Acid Bake, WL = Water Leach,





The results are summarized in Figure 13-4. The direct acid leach extractions were somewhat lower and produced slower solid/liquid separations. However, the acid bake and water leach results produced high extractions. If Zr and Nb elements are to be recovered from Foxtrot mineralization, it may be necessary to re-leach the acid leach residue (possibly with alkali). As well, the lighter REE are more highly extracted than the very heavy REE using the acid bake and water leach procedure. The acid leaching procedure (no acid bake) shows a much reduced extraction for the heavy REE.

100 90 - AL1 -AL2 80 WL-AB1 Extraction, % WL-AB2 70 WL-AB3 60 -WL-AB4 WL-AB5 50 WL-AB6 WL-AB7 40 **←-** WL-AB8 WL-AB9 30 La Ce Pr Nd Sm Eu Gd Tb Dy Ho Y Er Tm Yb Lu REE

FIGURE 13-4 EXTRACTION OF REE FOR THE ACID LEACH AND ACID BAKE – WATER LEACH TESTS

## LEACH SOLUTION PURIFICATION AND RECOVERY OF MIXED REE PRODUCT

The leach solution purification involved simple pH adjustment to pH 3.0. At this pH, iron, aluminum, silica, titanium, phosphate, zirconium, niobium and thorium are removed as a mixed hydroxide waste precipitate.

After impurity precipitation, the solids were filtered and analyzed. The remaining solution was then treated with oxalic acid at pH 2.0 to precipitate the REE from solution. The form of the precipitate is as a mixed REE oxalate. The mixed REE oxalate was filtered and washed and analyzed. The results are summarized in Table 13



TABLE 13-6 MIXED OXALATE PRECIPITATE OF REE RECOVERED FROM SOLUTION

Search Minerals Inc. - Foxtrot Project

Element	Units	Oxalate Precipitate Analysis (% or ppm)	Oxide	Oxalate Precipitate Analysis (% or ppm)	Recovery from Solution (%)
La	%	7.8	La <sub>2</sub> O <sub>3</sub>	9.15	99.96
Ce	%	18.3	$Ce_2O_3$	21.43	100.0
Pr	%	2.1	$Pr_6O_{11}$	2.54	99.97
Nd	%	8.7	$Nd_2O_3$	10.15	99.98
Sm	%	1.24	$Sm_2O_3$	1.44	99.94
Eu	ppm	759	$Eu_2O_3$	879	99.12
Gd	ppm	11,600	$Gd_2O_3$	13,370	99.95
Tb	ppm	1,840	$Tb_2O_3$	2,164	99.66
Dy	ppm	10,600	$Dy_2O_3$	12,165	99.90
Но	ppm	2,020	$Ho_2O_3$	23,14	99.80
Er	ppm	5,430	$Er_2O_3$	6,209	99.85
Tm	ppm	735	$Tm_2O_3$	839	98.92
Yb	ppm	4,240	$Yb_2O_3$	4,828	99.90
Lu	ppm	499	$Lu_2O_3$	567	98.81
Υ	ppm	50,763	$Y_2O_3$	64,466	99.99
U	ppm	5.5	$U_3O_8$	6	23.17
Th	ppm	282	$ThO_2$	321	97.73
		LREO	%	44.70	

Note: Y analysis not available. Y solid analysis entered as estimate using Nd analysis of precipitate as reference

## **SUMMARY**

The metallurgical process has been studied from initial recovery of a REE concentrate through to the purification of a leach solution and precipitation of a mixed product. Table 13-7 summarizes an overall recovery to a final mixed REE product.



TABLE 13-7 OVERALL RECOVERY OF REE Search Minerals Inc. – Foxtrot Project

Oxide	Conc. Recovery (%)	Leach Extraction	Impurity Loss	Precip. Efficiency (Oxalate)	Overall Recovery
Ce <sub>2</sub> O <sub>3</sub>	82.98	95.89	0.96	100.00	78.80
$Nd_2O_3$	83.04	95.64	1.18	99.98	78.47
$Y_2O_3$	83.71	92.48	1.12	99.99	76.54
$La_2O_3$	86.21	95.29	0.77	99.96	81.49
$Pr_6O_{11}$	86.56	95.79	1.06	99.97	82.01
$Sm_2O_3$	84.32	94.70	1.17	99.94	78.88
$Eu_2O_3$	83.73	94.28	1.19	99.12	77.31
$Gd_2O_3$	82.65	95.30	1.01	99.95	77.93
$Tb_2O_3$	82.38	94.69	1.07	99.66	76.91
$Dy_2O_3$	81.36	94.21	1.07	99.90	75.76
$Ho_2O_3$	81.59	93.31	1.08	99.8	75.15
$Er_2O_3$	81.67	90.83	1.17	99.85	73.21
$Tm_2O_3$	81.87	86.80	1.26	98.92	69.41
$Yb_2O_3$	81.73	79.89	1.50	99.90	64.25
$Lu_2O_3$	81.75	67.70	1.45	98.81	53.90

## **RECOMMENDATIONS**

SGS Minerals Services have recommended that further optimization work be started to confirm and improve the results obtained to date as well as to start pilot plant design testwork. Following optimization work, SGS Minerals Services have further recommended continuous metallurgical pilot plant studies. The continuous pilot plant results would be used to support Pre-feasibility and Feasibility studies of the Foxtrot Project.

RPA concurs with the SGS recommendations.



## 14 MINERAL RESOURCE ESTIMATE

## SUMMARY

Table 14-1 summarizes the Mineral Resource estimate for the Foxtrot Project as of September 30, 2011.

TABLE 14-1 SUMMARY MINERAL RESOURCE ESTIMATE - SEPT. 30, 2011 Search Minerals Inc. - Foxtrot Project

Category	Tonnes (000 t)	LREO (%)	HREO (%)	TREO (%)
Indicated	3,410	0.85	0.21	1.07
Inferred	5,850	0.75	0.21	0.96

#### Notes:

- 1. CIM definitions were followed for Mineral Resources.

- Mineral Resources are estimated at a cut-off grade of 130 ppm Dy.
   Numbers may not add due to rounding.
   HREO = oxide sums of Eu+Gd+Tb+Dy+Ho+Er+Tm+Yb+Lu+Y
   TREO = oxide sums of La+Ce+Pr+Nd+Sm+ Eu+Gd+Tb+Dy+Ho+Er+Tm+Yb+Lu+Y

### DATA

#### DRILL HOLES AND CHANNEL SAMPLES

Figure 14-1 shows the collar locations of the 43 diamond drill holes used for resource estimation, and the locations of the 11 surface channel samples that were also used for resource estimation. The drill holes include 18 holes (3,138 m) drilled in 2010 during the Phase I drilling campaign, and 25 holes (4,817 m) drilled in 2011 during the Phase I and II drilling campaigns. All of the channel samples (269 m) were collected during 2011.

## **ASSAYS**

All of the assay data available at the end of September 2011 were used for resource estimation. At this cut-off date for the assay data base, all of the assays from the Phase I were available. From the Phase II drilling campaigns, all of the assays from felsic intervals were available. Some of the assays from mafic intervals were not available by the end of September 2011, but this does not affect the resource estimates since all of the mafic material is waste. For the channel samples, all of the assays were available.



For sample intervals where internal lab duplicates existed, the assay used for resource estimation purposes was the first assay. All of the duplicates were checked and in no case was there a significant difference between the first assay and the internal duplicate.

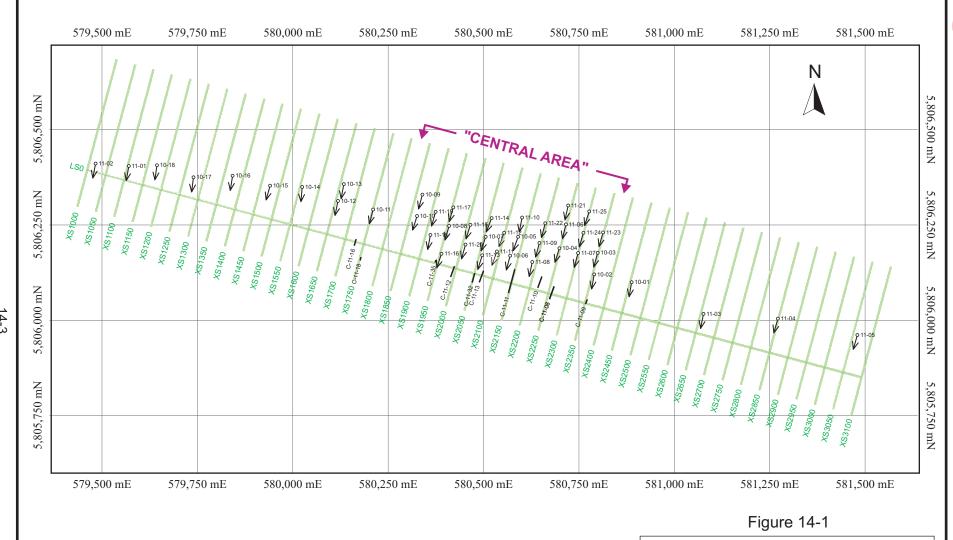
#### **DENSITY**

During the site visit, 28 samples were collected for determination of dry bulk density. The five augen gneiss samples had an average dry bulk density of 2.53 t/m<sup>3</sup>. The 12 felsic samples had an average dry bulk density of 2.71 t/m<sup>3</sup>. The 11 mafic samples had an average dry bulk density of 2.88 t/m<sup>3</sup>. These averages were used to calculate tonnages from volumes for each of the three rock types.

### **TOPOGRAPHY**

The topographic surface used for the current resource estimation was created by merging surveyed drill hole collars and the regional topographic contours from the public Geoscience Atlas provided by the government of Newfoundland and Labrador.

With drill hole collars differing from the government's regional topography by up to ±6m, the regional topography was locally modified by calculating residuals at the collar locations, creating a smoothed map of the residuals, and adding the map of residuals to the original regional topography. The result, shown in Figure 14-2, is a topography model that reflects the broad shape of the regional topography while exactly honouring the surveyed elevations at all of the hole collar locations.



200

Metres

100

300

400

500

## Search Minerals Inc.

## Foxtrot Project

Port Hope Simpson Area, Newfoundland & Labrador, Canada Location of Drill Holes and Channel Samples used for 2011 Resource Estimation

used for 2011 Res

## Legend:

11-05 → Drill Hole & Number

Channel

Section Line

June 2012

Source: Search Minerals Inc., 2012.

14-4

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#### DATA ANALYSIS

There are 17 elements included in the Foxtrot Project resource block model:

- La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu (all of the lanthanoids with the exception of promethium (Pm), which does not occur in nature)
- Yttrium (Y), which is usually classified as a rare earth
- Zirconium (Zr) and Niobium (Nb), which are not classified as rare earths

Also included are combinations of the oxides of these 17 metals: the total rare earth oxides (TREO), the light rare earth oxides (LREO) and the heavy rare earth oxides (HREO).

The following discussion on statistical analysis focuses on dysprosium (Dy) and neodymium (Nd). Dy has been chosen since it is the heavy rare-earth element (HREE) at Foxtrot Project with the greatest in situ value (grade × metal price). Similarly, Nd has been chosen since it is the light rare-earth element (LREE) with the greatest in situ value.

Table 14-2 shows the correlation coefficients between the 17 elements. Within the LREE group (La, Ce, Pr, Nd and Sm), highlighted in blue, the correlations are extremely high (greater than 0.98). Within the HREE group (Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu and Y), highlighted in green, the correlations are all strong (greater than 0.80). Since all of the elements correlate well with each other, the observations and remarks made about Dy and Nd in the following sections are also pertinent to the other elements with which they share a strong correlation.



## TABLE 14-2 CORRELATION COEFFICIENTS Search Minerals Inc. – Foxtrot Project

	La	Се	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Но	Er	Tm	Υb	Lu	Υ	Zr	Nb
La	1.00	0.99	0.99	0.99	0.98	0.94	0.97	0.93	0.91	0.89	0.87	0.85	0.84	0.82	0.91	0.75	0.89
Се		1.00	0.99	0.99	0.99	0.96	0.98	0.95	0.93	0.91	0.89	0.87	0.86	0.84	0.93	0.77	0.89
Pr			1.00	0.99	0.99	0.96	0.98	0.95	0.93	0.91	0.90	0.88	0.86	0.85	0.93	0.77	0.89
Nd		•		1.00	0.99	0.97	0.98	0.96	0.93	0.91	0.90	0.88	0.86	0.85	0.93	0.77	0.89
Sm					1.00	0.96	0.99	0.98	0.96	0.94	0.93	0.91	0.90	0.88	0.95	0.80	0.90
Eu						1.00	0.95	0.92	0.90	0.88	0.86	0.84	0.82	0.80	0.89	0.71	0.85
Gd							1.00	0.99	0.98	0.97	0.96	0.94	0.93	0.91	0.97	0.81	0.90
Tb								1.00	0.99	0.99	0.98	0.97	0.96	0.95	0.99	0.83	0.89
Dy									1.00	0.99	0.99	0.98	0.98	0.96	0.99	0.83	0.88
Но										1.00	0.99	0.99	0.99	0.98	0.99	0.84	0.87
Er											1.00	0.99	0.99	0.98	0.99	0.84	0.87
Tm												1.00	0.99	0.99	0.98	0.85	0.86
Υb													1.00	0.99	0.98	0.86	0.85
Lu														1.00	0.97	0.86	0.84
Y															1.00	0.83	0.88
Zr																1.00	0.77
Nb																	1.00

## HISTOGRAMS AND SUMMARY STATISTICS

Figure 14-3 shows histograms of Dy and Nd for all samples. The distributions show three prominent modes that correspond to the three main rock units. The lowest mode belongs to samples from the Mafic Volcanic (MV) unit and from the Augen Gneiss (AG), the rock units that bound a steeply-dipping zone of mixed volcanics to the south and north. The middle and upper modes belong to samples from the zone of mixed volcanics.



## FIGURE 14-3 HISTOGRAMS AND SUMMARY STATISTICS FOR DYSPROSIUM AND NEODYMIUM FOR ALL SAMPLES

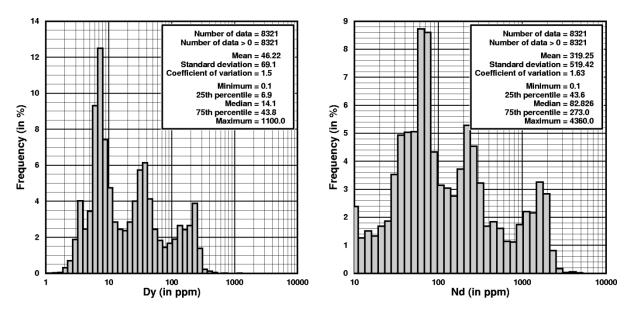
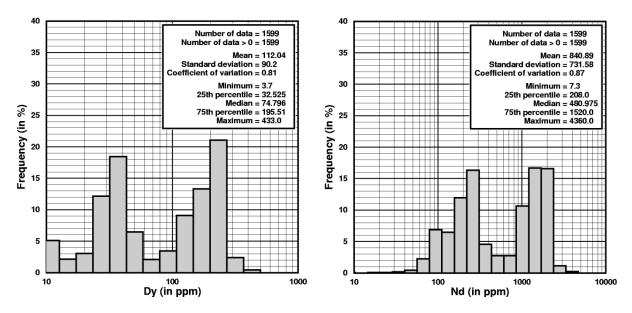


FIGURE 14-4 HISTOGRAMS AND SUMMARY STATISTICS FOR DYSPROSIUM AND NEODYMIUM IN FELSIC BANDS.



The zone of mixed volcanic consists of inter-layered bands of felsic and mafic volcanics; with felsic rocks accounting for approximately 2/3 of the zone, this zone is referred to in this section as the Felsic Zone (FZ). All of the mineralization with economic potential lies in the felsic bands. Figure 14.4 shows the histograms of Dy and Nd in the felsic bands of the FZ. The two modes on these histograms correspond to the northern and southern parts of the FZ. Toward the north, near the augen gneiss, the felsic bands of the FZ have



generally low to moderate grades. Toward the south, the felsic bands have generally moderate to high grades.

Table 14-3 provides, for all 17 elements, a statistical summary of the distributions of the samples from the felsic bands.

TABLE 14-3 SUMMARY STATISTICS FOR FELSIC SAMPLES Search Minerals Inc. – Foxtrot Project

	N	Average (ppm)	Standard Deviation (ppm)	Coefficient of Variation	Minimum (ppm)	25th percentile (ppm)	Median (ppm)	75th percentile (ppm)	Maximum (ppm)
La	1,599	984.4	872.9	0.89	8.8	254	532	1,710	5,460
Ce	1,599	1991.1	1,741.6	0.87	17.2	503	1,090	3,550	10,800
Pr	1,599	226.3	196.8	0.87	1.9	56.7	128	404	1,210
Nd	1,599	840.9	731.6	0.87	7.3	207	477	1,520	4,360
Sm	1,599	151.8	127.9	0.84	1.7	40.8	95.1	272	681
Eu	1,599	7.4	6.6	0.89	0.2	1.4	4	13.7	33.1
Gd	1,599	120.2	98.8	0.82	1.9	34.5	78.4	213	519
Tb	1,599	19.3	15.6	0.81	0.5	5.7	12.6	33.7	78.4
Dy	1,599	112	90.2	0.81	3.7	32.4	74.2	194	433
Но	1,599	21.6	17.3	8.0	0.9	6.3	14.5	37.3	81.4
Er	1,599	60.8	48.6	8.0	3.3	17.7	42.2	105	225
Tm	1,599	8.8	6.9	0.79	0.5	2.6	6.1	15.1	31.4
Yb	1,598	54.8	42.7	0.78	2.9	17.2	38	93.5	191
Lu	1,599	8.2	6.2	0.76	0.4	2.8	5.6	13.8	28
Υb	1,599	627.7	508.2	0.81	31	173	419	1,105	2584
Zr	1,599	5,751.6	4,,764.5	0.83	114	1,697	3,794	9,982	41,430
Nb	1,523	404.9	333.2	0.82	17	102	206	739	1,360

## **GRADE CAPPING**

No capping of high-grade assays is required since all of the grade distributions for felsic samples have very low coefficients of variation, well below one, which indicates that averages are not dominated by a few extremely high values. Local grade interpolation, which uses local weighted averages, will not have any problem with spatially erratic extreme values creating large halos of abnormally high grade estimates.

#### VARIOGRAMS

With very strong correlations between all of the elements, a single variogram model was used for all elements. Figure 14-5 shows the average experimental variogram for all elements, with the averaging being done after the sill of the variogram for each element



has been standardized to one. The experimental variograms in this figure use only the assay data from felsic sample intervals, and group them into three directions:

- along the strike of the Felsic Zone, horizontally in the N75°W direction;
- down the dip, 70° to 90° downward from horizontal in the N15°E direction; and
- perpendicular to the banding, 0° to 20° upward from horizontal in the N15°E direction.

The direction of maximum continuity is the strike direction, with a range of 280 m. In the down-dip direction, the range is 140 m; and across the felsic bands the range is only 10 m.

FIGURE 14-5 AVERAGE VARIOGRAM FOR ALL ELEMENTS IN THE FELSIC ZONE



Nugget effect = 0.15 Number of structures = 1 Total sill = 1.0

Structure 1: Height = 0.85 Range = 280 Type = Exponential

DOWN DIP:

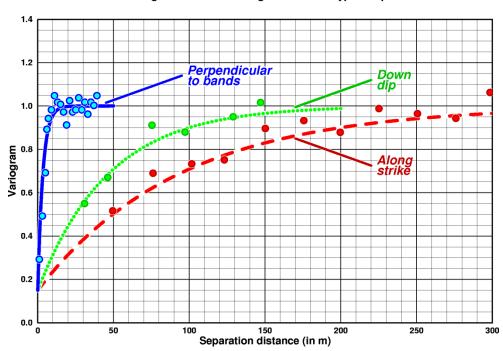
Nugget effect = 0.15 Number of structures = 1 Total sill = 1.0

Structure 1: Height = 0.85 Range = 140 Type = Exponential

#### PERPENDICULAR TO BANDS:

Nugget effect = 0.15 Number of structures = 1 Total sill = 1.0

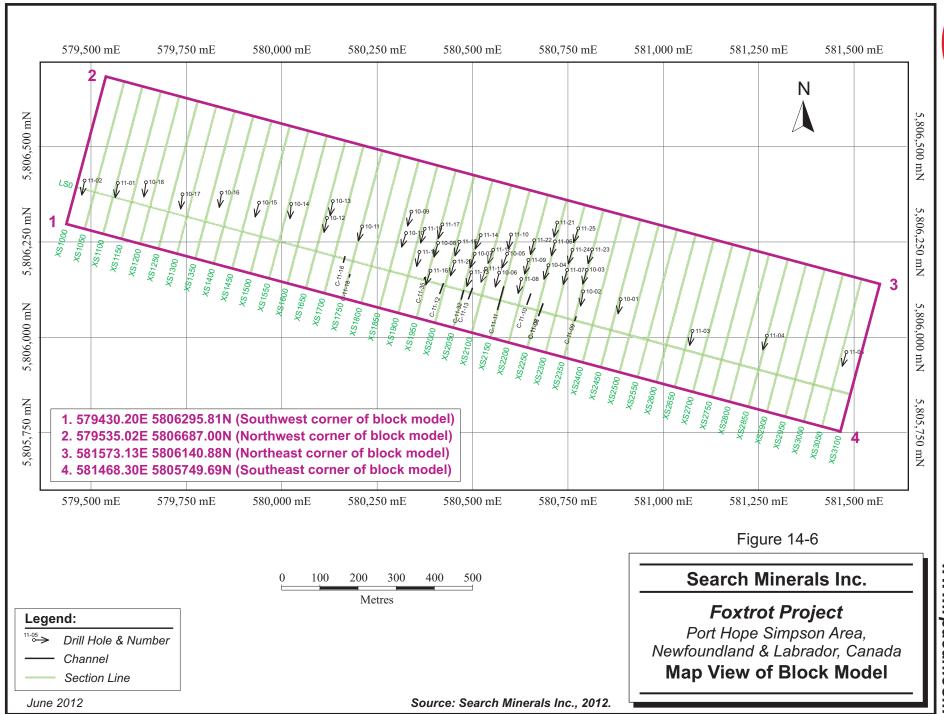
Structure 1: Height = 0.85 Range = 10 Type = Exponential

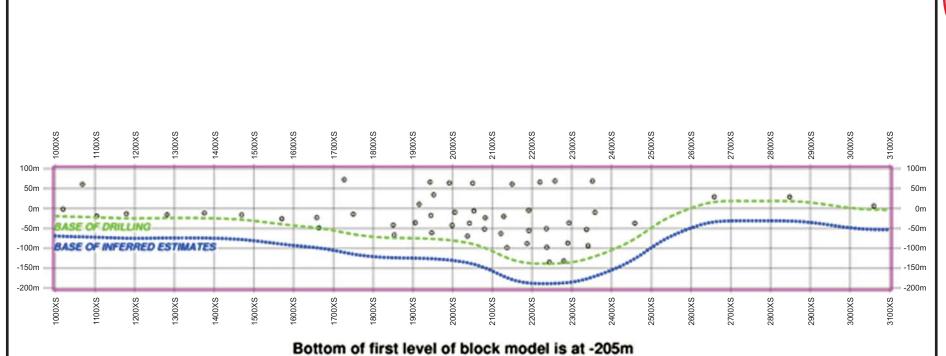




## RESOURCE BLOCK MODEL CONFIGURATION

As shown in Figures 14-6 and 14-7, the block model uses 10 m by 5 m by 10 m blocks that are aligned with the strike of the deposit, which is in the N75°W direction. The block model has 211 columns in the strike direction, 81 rows in the horizontal direction across the FZ zone, and 31 levels in the vertical direction.





Top of 31st level of block model is at +105m

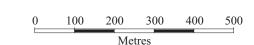


Figure 14-7

## Search Minerals Inc.

## Foxtrot Project

Port Hope Simpson Area, Newfoundland & Labrador, Canada Longitudinal Section View of Block Model, Looking N15°E

Source: Search Minerals Inc., 2012.

June 2012



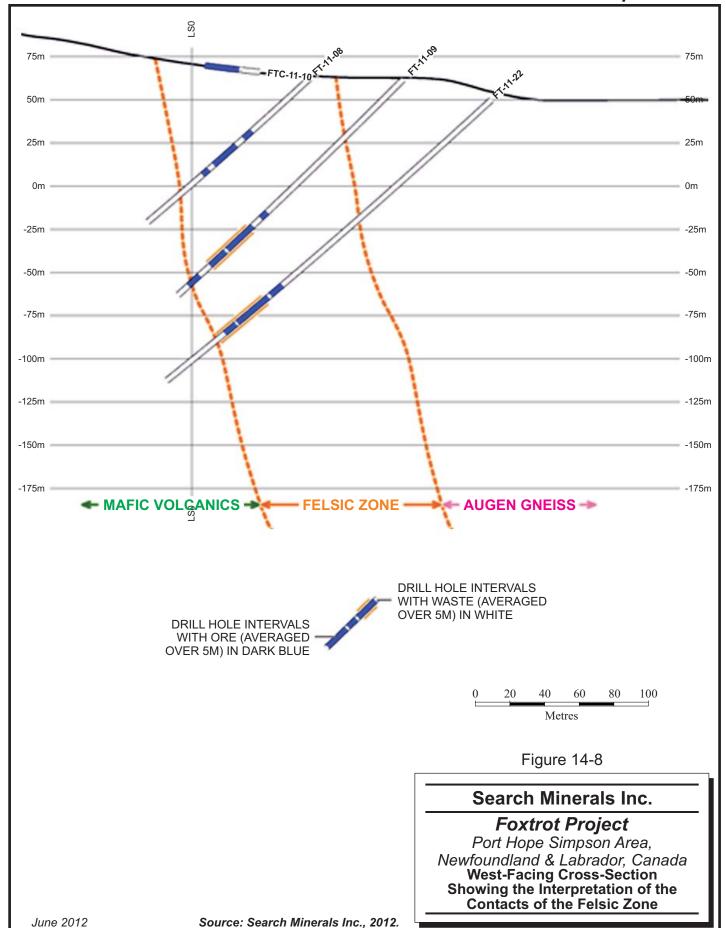
As shown in Figure 14-7, the base of the block model is at -205 m, which is about 50 m below the base of the Phase II drilling in the Central Area. With the range of correlation in the down-dip direction being 140 m, and with the deepest drill holes still showing strong mineralization, extending the block model 50 m beneath the base of drilling is reasonable. Resources beneath the base of drilling will be classified as Inferred. The Phase III drilling, which was completed in Q1 2012, confirms that the geology and grades observed in the Phase I and Phase II holes in the Central Area do continue beneath the base of Phase II drilling.

## RESOURCE ESTIMATION PROCEDURE

#### TONNAGE ESTIMATION

The two contacts of the Felsic Zone were modelled in 3D and wireframed to produce the surfaces shown in orange in Figure 14-8. All 10 m by 5 m by 10 m blocks with centres between these two surfaces, below the topography, and within 50 m of a drill hole in the vertical direction (the dotted line in Figure 14-7) received tonnage and grade estimates.







For each block being estimated, the first step in the estimation procedure was an estimation of the proportion of felsic material in the block. This was done using an indicator kriging of the nearby samples, with the felsic intervals coded as one and the non-felsic (usually mafic) intervals coded as 0. The variogram model used for this indicator kriging was the one shown in Figure 14-5. The radiuses of the search ellipse were set to half of the variogram ranges (140 m by 70 m by 5 m), and aligned with the strike and dip of the Felsic Zone. An octant search was used to limit the number of samples from any one quadrant, with no more than three samples being used per octant. This indicator kriging produces an estimate of the proportion of felsic material in the block; the remaining material is assumed to be waste and is given grades of zero.

Once the volume proportion of felsic and mafic material had been estimated, the tonnage of the block was calculated by multiplying the volume-weighted average of the 2.71 t/m³ density for felsic material and the 2.88 t/m³ density for mafic material. The separate tonnages of the felsic and the mafic material in the block were also written to the block model file so that the resource inventory could tabulate felsic tonnages and grades separately from the waste material.

#### **GRADE ESTIMATION**

The grades of the 17 elements were estimated by ordinary kriging of the assays; no compositing was done. Half of the sample intervals are exactly one metre in length, but there are some as short as 0.05 m, and some as long as 2.5 m. To account for the fact that some of the assays used for local grade interpolation have different lengths than others, the ordinary kriging weights were multiplied by the sample length and then renormalized to sum to one.

For each block being estimated, the direction of maximum continuity was aligned with the strike and dip of the Felsic Zone. The search ellipse had radiuses equal to half the range of the variogram model: 140 m in the strike direction, 70 m in the dip direction, and 5 m in the direction perpendicular to the felsic banding.

A maximum of three samples per octant were used for estimation. When more than three samples were available in any octant, the three retained for estimation were those with the lowest variogram value, i.e., the closest in terms of statistical distance, not Euclidean distance.



## RESOURCE CLASSIFICATION

Mineral resources have been classified in accordance with the CIM (2010):

A **Measured Mineral Resource** is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, physical characteristics are so well established that they can be estimated with confidence sufficient to allow the appropriate application of technical and economic parameters, to support production planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough to confirm both geological and grade continuity.

An **Indicated Mineral Resource** is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics can be estimated with a level of confidence sufficient to allow the appropriate application of technical and economic parameters, to support mine planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough for geological and grade continuity to be reasonably assumed.

An **Inferred Mineral Resource** is that part of a Mineral Resource for which quantity and grade or quality can be estimated on the basis of geological evidence and limited sampling and reasonably assumed, but not verified, geological and grade continuity. The estimate is based on limited information and sampling gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes.

Resource classification was based on two criteria: the number of octants with data, and the horizontal and vertical position of the block:

- Blocks were classified as Indicated if they were estimated using data in all octants, if they were in the Central Area (Figure 14-1), and if they were above the base of drilling (Figure 14-7). These requirements limit the Indicated Resources to the well-drilled heart of the deposit.
- All blocks not classified as Indicated were classified as Inferred if they were above the base of drilling, or no more than 50 m below the base of drilling (Figure



14-7). With the search ellipse having used radii that were half of the variogram range, this requirement limits the Inferred Resources to regions where there is at least one well correlated sample nearby. In the vertical direction, the requirement is a bit more restrictive: Inferred Resources cannot extend more than 50 m downdip from the Phase II drill holes.

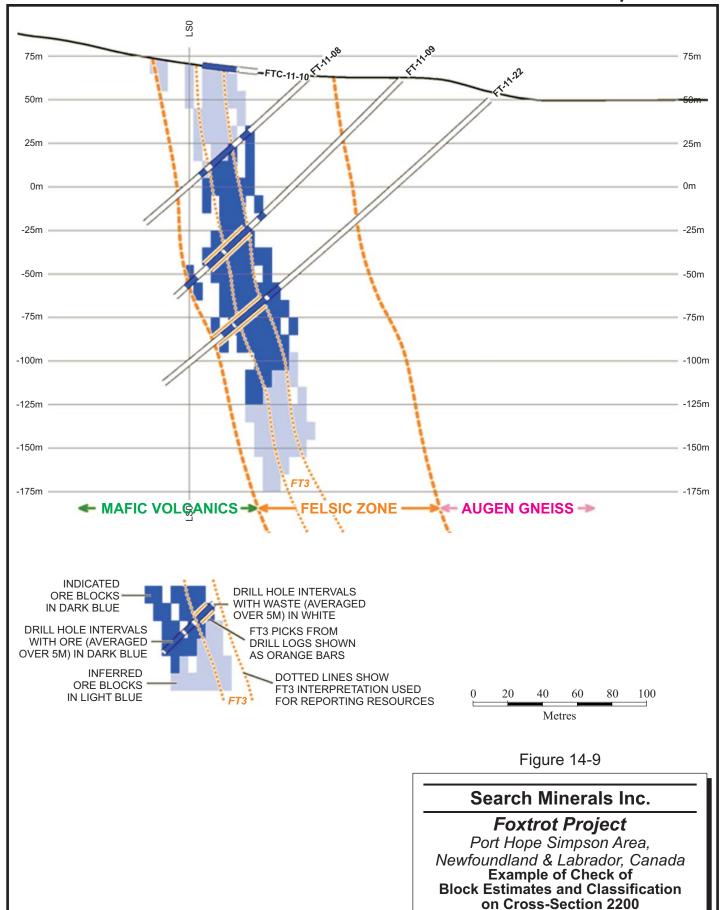
## CHECKS OF RESOURCE BLOCK MODEL

The resource block model was checked visually against the original drill hole data on cross-sections, maps and in a 3D viewer to confirm that the estimated felsic content and the estimated grades were consistent with nearby drill hole data, that the topography and the Felsic Zone contacts were respected and that the classification properly showed only Inferred material below the base of drilling and in the extensions east and west of the Central Area. Figure 14-9 shows an example of one of these checks, a section showing the grade estimates on the cross-section through holes FT11-08, FT11-09 and FT11-22. In addition to honouring the drill hole data, the classification is also correct, as shown by the dark (Indicated) and light (Inferred) blue shading of the estimated blocks.

Also plotted on the cross-sections was the geologists' interpretation of the felsic band with the strongest mineralization, a band referred to in the geological logs as FT3. Although the interpreted location of the FT3 band was not used directly in the resource estimation procedure, the block model clearly mirrors the geologists' interpretation, with the high-grade blocks tending to run along the south side of the Felsic Zone in the Central Area.



June 2012



Source: Search Minerals Inc., 2012.



## MINERAL RESOURCE ESTIMATE

The Indicated mineral resource and Inferred mineral resource estimates are presented in Tables 14-4 and 14-5 below, respectively. RPA estimates Mineral Resources on the Foxtrot Project deposit using drill hole data available as of September 30, 2011. Mineral Resource estimates use a cut-off grade of 130 ppm dysprosium. Using preliminary assessments of metal prices and metallurgical recoveries, this reporting cut-off, which corresponds to 150 ppm for the oxide form, Dy<sub>2</sub>O<sub>3</sub>, produces an NSR considerably higher than the anticipated cost of mining and processing ore. Even with changes and uncertainties in the metal prices, recoveries and costs, material with more than 130 ppm Dy meets the requirement of the CIM (2010): that Mineral Resources have a reasonable prospect of economic extraction.

## SENSITIVITY OF REPORTING CUT-OFF

Some of the uncertainties regarding metal prices, metallurgical recoveries, and the cost of mining and processing have been addressed in the Preliminary Economic Assessment study. However, there is still uncertainty in the reporting cut-off that best reflects a break-even economic cut-off in the future. Fortunately, the strong correlations between the various elements that contribute economic value make it possible to assess the sensitivity of resources to changes in cut-off. Changes in the reporting cut-off on dysprosium will correspond very directly to changes in the cut-off on any other element, or groups of elements, or on NSR. Table 14-6 shows how resource tonnage and grade are affected by ±25 ppm changes in the dysprosium cut-off; this magnitude of change is approximately a ±20% change in the reporting cut-off.



TABLE 14-4 INDICATED MINERAL RESOURCE ESTIMATE - SEPT. 30, 2011

Search Minerals Inc. – Foxtrot Project

		Central	Extensions	TOTAL
Tonnes (t)		3,410,000		3,410,000
Element	Units			
Υ	ppm	1,059		1,059
La	ppm	1,663		1,663
Ce	ppm	3,364		3,364
Pr	ppm	385		385
Nd	ppm	1,442		1,442
Sm	ppm	257		257
Eu	ppm	13		13
Gd	ppm	204		204
Tb	ppm	33		33
Dy	ppm	189		189
Но	ppm	36		36
Er	ppm	102		102
Tm	ppm	15		15
Yb	ppm	91		91
Lu	ppm	13		13
Zr	ppm	9,640		9,640
Nb	ppm	698		698
LREE	%	0.71		0.71
HREE	%	0.18		0.18
TREE	%	0.89		0.89
Oxide	Units			
$Y_2O_3$	ppm	1,345		1,345
$La_2O_3$	ppm	1,946		1,946
$CeO_2$	ppm	4,138		4,138
Pr <sub>6</sub> O <sub>11</sub>	ppm	466		466
$Nd_2O_3$	ppm	1,687		1,687
$Sm_2O_3$	ppm	298		298
$Eu_2O_3$	ppm	15		15
$Gd_2O_3$	ppm	234		234
Tb₄O <sub>7</sub>	ppm	39		39
$Dy_2O_3$	ppm	218		218
$Ho_2O_3$	ppm	42		42
$Er_2O_3$	ppm	116		116
$Tm_2O_3$	ppm	17		17
$Yb_2O_3$	ppm	103		103
Lu <sub>2</sub> O <sub>3</sub>	ppm	15		15
ZrO <sub>2</sub>	ppm	13,014		13,014
$Nb_2O_5$	ppm	879		879
LREO	%	0.85		0.85
HREO	%	0.21		0.21
TREO	%	1.07		1.07

## Notes:

- 1. CIM definitions were followed for Mineral Resources.
- 2. Mineral Resources are estimated at a cut-off grade of 130 ppm Dy.
- 3. Numbers may not add due to rounding.
- 4. HREE = Eu+Gd+Tb+Dy+Ho+Er+Tm+Yb+Lu+Y.
- 5. TREE = La+Ce+Pr+Nd+Sm+ Eu+Gd+Tb+Dy+Ho+Er+Tm+Yb+Lu+Y.



TABLE 14-5 INFERRED MINERAL RESOURCE ESTIMATE – SEPT. 30, 2011 Search Minerals Inc. – Foxtrot Project

		Central	Extensions	TOTAL
Tonnes (t)		3,000,000	2,850,000	5,850,000
Element	Units			
Y	ppm	1,043	988	1,016
La	ppm	1,648	1,277	1,467
Ce	ppm	3,314	2,616	2,974
Pr	ppm	380	302	342
Nd	ppm	1,418	1,129	1,277
Sm	ppm	253	207	231
Eu	ppm	13	10	11
Gd	ppm	202	173	188
Tb	ppm	32	29	31
Dy	ppm	187	175	181
Но	ppm	36	34	35
Er	ppm	100	100	100
Tm	ppm	14	15	15
Yb	ppm	90	96	93
Lu	ppm	13	15	14
Zr	ppm	9,679	10,710	10,182
Nb	ppm	698	561	631
LREE	%	0.70	0.55	0.63
HREE	%	0.17	0.16	0.17
TREE	%	0.87	0.72	0.80
Oxide	Units			
$Y_2O_3$	ppm	1,324	1,255	1,290
La <sub>2</sub> O <sub>3</sub>	ppm	1,928	1,494	1,716
$CeO_2$	ppm	4,076	3,218	3,657
Pr <sub>6</sub> O <sub>11</sub>	ppm	460	365	414
$Nd_2O_3$	ppm	1,659	1,321	1,494
$Sm_2O_3$	ppm	294	240	268
$Eu_2O_3$	ppm	15	11	13
$Gd_2O_3$	ppm	232	200	216
$Tb_4O_7$	ppm	38	35	36
$Dy_2O_3$	ppm	215	201	208
$Ho_2O_3$	ppm	41	40	40
$Er_2O_3$	ppm	114	114	114
$Tm_2O_3$	ppm	16	17	17
$Yb_2O_3$	ppm	102	109	106
Lu <sub>2</sub> O <sub>3</sub>	ppm	15	17	16
$ZrO_2$	ppm	13,067	14,458	13,746
$Nb_2O_5$	ppm	880	707	796
LREO	%	0.84	0.66	0.75
HREO	%	0.21	0.20	0.21
TREO	%	1.05	0.86	0.96

## Notes:

- CIM definitions were followed for Mineral Resources.
- 2. Mineral Resources are estimated at a cut-off grade of 130 ppm Dy.
- 3. Numbers may not add due to rounding.
- 4. HREE = Eu+Gd+Tb+Dy+Ho+Er+Tm+Yb+Lu+Y.
- 5. TREE = La+Ce+Pr+Nd+Sm+ Eu+Gd+Tb+Dy+Ho+Er+Tm+Yb+Lu+Y.



## TABLE 14-6 SENSITIVITY OF TOTAL MINERAL RESOURCES TO ±25 PPM CHANGES IN THE DY CUT-OFF GRADE

**Search Minerals Inc. – Foxtrot Project** 

Classification	Dy Cut-off Grade (ppm)	Tonnage	Dy (ppm)	Nd (ppm)	Y (ppm)	HREE+Y (%)	TREE+Y (%)
Indicated	105	4,020,000	179	1,368	1,000	0.17	0.84
	130	3,410,000	189	1,442	1,059	0.18	0.89
	155	2,720,000	201	1,537	1,123	0.19	0.94
Inferred	105	8,100,000	163	1,135	917	0.15	0.71
	130	5,850,000	181	1,277	1,016	0.17	0.80
	155	3,980,000	200	1,437	1,117	0.19	0.89
Classification	Dy₂O₃Cut-off Grade (in ppm)	Tonnage	Dy₂O₃ (in ppm)	Nd₂O₃ (in ppm)	Y <sub>2</sub> O <sub>3</sub> (in ppm)	HREO+Y (in %)	TREO+Y (in %)
Indicated	121	4,020,000	205	1,595	1,270	0.20	1.01
	150	3,410,000	218	1,687	1,345	0.21	1.07
	178	2,720,000	231	1,793	1,426	0.23	1.13
Inferred	121	8,100,000	188	1,323	1,164	0.19	0.86
	150	5,850,000	208	1,494	1,290	0.21	0.96



## 15 MINERAL RESERVE ESTIMATE

A technical and economic assessment to permit a Mineral Reserve estimate on the Project has not yet been completed.



### **16 MINING METHODS**

### INTRODUCTION

RPA investigated the potential for open pit mining of the Indicated and Inferred Mineral Resources, using REE prices appropriate for a PEA. Open pit and underground mining options were evaluated with run of mine (ROM) material being processed at a rate of 3,000 tpd to 4,000 tpd in a process plant on site, producing a mixed rare earth product. Infrastructure requirements, for road access, power, and for room and board facilities, were also considered. Environmental considerations include the impact of the pit, waste rock dump, and tailings storage.

Open pit (OP) and underground (UG) mine operating costs (opex) were estimated based on preliminary mine concepts and on typical costs for Canadian mining operations of a similar scale. During the trade-off process, at the assumed process rate of 3,000 tpd and 8:1 open pit strip ratio, the open pit operating cost was estimated to be \$4.21/t, while the underground operating cost was estimated to be \$51.57/t. The underground operating cost includes direct opex, additional general and administration (G&A) (mainly due to greater manpower, additional accommodations, and higher fly-in fly-out expenses), and lateral/vertical development. This underground opex was itemized as follow:

UG mining \$42.57/t milled

UG capital development \$2.22/t milled

UG additional G&A vs. OP \$6.78/t milled

The UG/OP opex ratio gives an open pit strip ratio of 11.25:1 as the break-even opex at which point the underground mining method should be more favourable. At this stage of the PEA, considering the REE mineralization, the assumed open pit physicals and the overall operating cost, the optimal pits returned a maximum strip ratio of 6:1. As a result, a study on underground mining was not pursued any further for the Foxtrot Project.



### **OPEN PIT MINING**

The production rate is assumed to be 1,440,000 tpa or 4,000 tpd of REE bearing material. Mining of mineralized material and waste (no pre-stripping of overburden is required, as the deposit is exposed on surface) would be carried out by the owner and by contractor to balance mining equipment requirements over the life of the operation.

The combination of owner-operated and contract mining will be carried out using a conventional open pit method consisting of the following activities:

- Drilling performed by conventional production drills.
- Blasting using ANFO (ammonium-nitrate fuel oil) and a down-hole delay initiation system.
- Loading and hauling operations performed with hydraulic shovel, front-end loader, and rigid frame haulage trucks.

The production equipment will be supported by bulldozers, graders, and water trucks.

### **GEOTECHNICAL ASSESSMENTS**

In the absence of geotechnical information, pit slope angles were selected based on industry averages. Pit optimizations were carried out using pit slopes of 45°.

Design parameters for the waste dumps and the overburden pile were also selected based on industry averages.

These assumptions will have to be further assessed as the Project is advanced.

### **HYDROLOGICAL / HYDROGEOLOGICAL ASSESSMENTS**

Hydrogeological and hydrological conditions may have an impact on pit design parameters. At this stage of the Project, industry average pit slope angles were used. Capital expenditures and operating costs related to water management were part of the cost estimation process.

The hydrogeological/hydrological conditions will have to be further assessed as the Project is advanced.



### **SEISMICITY**

Seismicity issues were not considered in conceptual design at this point in the Project. The seismicity will have to be assessed and be considered in more detailed engineering steps of the Project.

### MINE DESIGN

Open pit possibilities were investigated by pit optimization / floating cone analysis, using Whittle software, run on the resource block model. Pit optimizations indicated that a significant proportion of the resource block model would be economic to mine using open pit methods.

Whittle pit optimizations were performed based on typical costs for comparable operations and projects of a similar scale. Cost details for optimization purposes were as follows:

Open pit mining \$4.21/t moved

Milling \$60.00/t milled

G&A \$7.75/t milled

NSR revenue factors were calculated using metallurgical recoveries, offsite costs for REE separation, and REE prices, which are discussed in detail under their respective sections in this report. The revenue factors were used to generate an NSR value in the model which was used to float cones in the Whittle software.

In the absence of geotechnical information, pit slope angles were selected based on industry averages. Pit optimizations were carried out using pit slopes of 45°.

Pit optimizations do not include individual benches or ramp design. For the pit size, production requirements, and recommended equipment fleet, RPA considers mining of 10 m benches and development of 22 m wide ramps, including ditches and safety berm, to be appropriate for the open pit operations. The ramps should be designed at 10% grade with exits appropriately located in order to minimize distances to the mill and the waste rock dumps. Figure 16-1 shows an isometric view showing the location of pit shells.



A general site plan of the Project, developed for the Base Case Open Pit Scenario, is included in Figure 16-2. This figure shows the location of main surface facilities as open pit, tailings pond and dams, waste dumps, process plant, camp facilities and haul roads.

### PRODUCTION QUANTITIES

Production quantities total 14.3 Mt of potentially mineable material, at a grade of 0.58% total REE. This includes dilution of the mineralized felsic material with the intercalated mafic material in each block (assumed to have zero grade). The mafic material portion within mineralized blocks in the final pit shell supporting the above tonnage totals 3.1 Mt, which is equivalent to an internal dilution of 27.7% tonnage. On a block by block basis (10 m x 5 m x 10 m high) and within a PEA level of detail and precision, it was assumed that blocks mined at the contact of REE mineralization and waste will not contribute any additional dilution other than their intrinsic mafic material. Therefore, no operational dilution was added over and above and a 100% mining recovery factor was applied for the same reason.

As a result, the diluted and recovered tonnage and grades remained the same. Waste within the pit shell totals 105.8 Mt, resulting in an average strip ratio of 7.4:1. The difference with the maximum strip ratio of 6:1 reached in the pit optimization process is due to a post- cut-off grade increase within the final pit shell in order improve the head grade at the process plant and to optimize the economics of the project.

The proportion of Inferred Resources in the material that may be potentially mineable via open pit is approximately 65%.

### **WASTE DUMP**

A waste dump was designed to receive all waste materials contained in the open pit. As per Figure 16-2, the waste dump is located west of the open pit, with a height and total footprint of approximately 75 m and one kilometre square, respectively, considering a swell factor of 1.5.



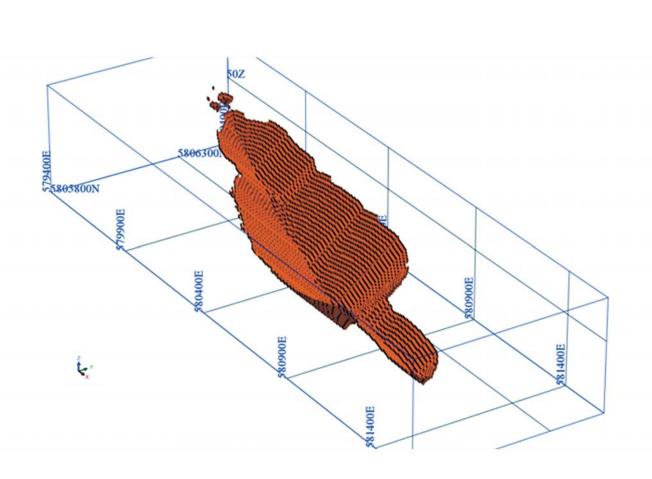


Figure 16-1

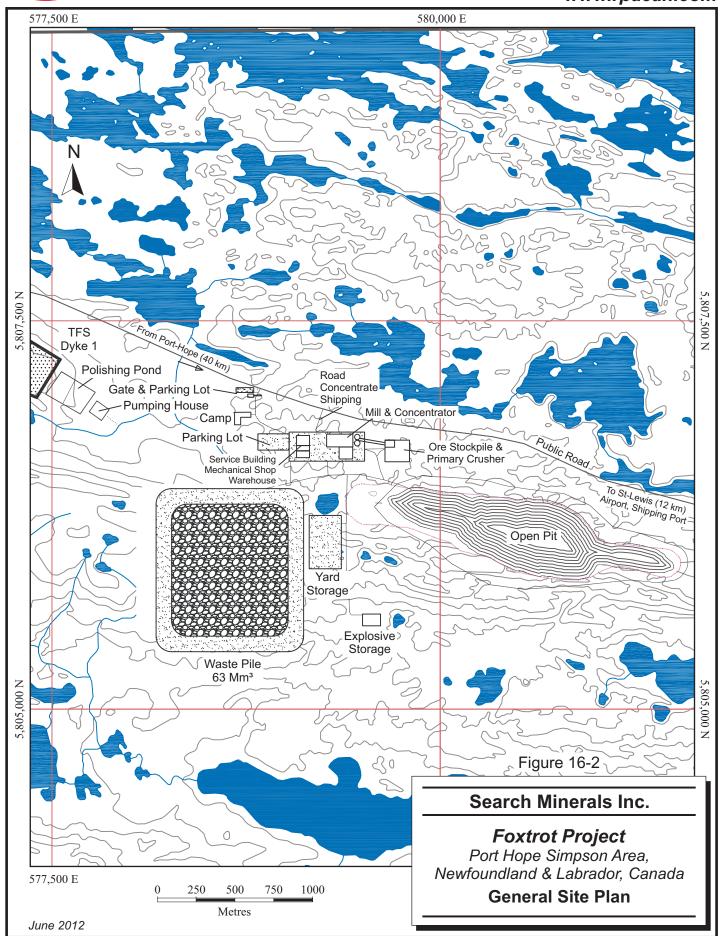
# **Search Minerals Inc.**

# Foxtrot Project

Port Hope Simpson Area,
Newfoundland & Labrador, Canada
Isometric View of Foxtrot Pit Shell
Looking NW

June 2012







### **PRODUCTION SCHEDULE**

Both the open pit owner-operated and contract mining will be carried out on two 12-hour shifts per day, seven days per week, with the exception of the first and last year of the LOM plan, when only one 12-hour shift / seven days per week will be required as the annual strip ratio will be lower. Staffing will be on a rotating shift system being carried out by four shift crews.

Highlights of the production schedule are as follow:

- A short ramp-up to full production in Year 1
- Production of 1,440,000 tonnes per year, or 4,000 tpd
- Waste mining average of 10.6 Mt per year
- Contractor assistance with high waste mining requirements in years 3 to 6

The production schedule is summarized in Table 16-1.

TABLE 16-1 PRODUCTION SCHEDULE Search Minerals Inc. – Foxtrot Project

Year	Mined REE Bearing Mined Material Waste (Mt) (Mt)	
-2	-	-
-1	-	-
1	1,368,000	2,681,000
2	1,440,000	8,515,000
3	1,440,000	14,269,000
4	1,440,000 18,443,00	
5	1,440,000	18,091,000
6	1,440,000	16,584,000
7	1,440,000	9,071,000
8	1,440,000	7,212,000
9	1,440,000 6,227,000	
10	1,391,000	4,745,000
Total	14,279,000	105,838,000

### MINE EQUIPMENT

The owner's mine equipment fleet for the open pit operation, listed in Table 16-2, was selected based on comparison to operations of similar size and using InfoMine USA Inc.



TABLE 16-2 OPEN PIT MINING FLEET Search Minerals Inc. – Foxtrot Project

Туре	Quantity
Backhoe Hydraulic Shovel 13 m³	1
Backhoe Hydraulic Shovel 2 m³	1
Front End Loader 13 m <sup>3</sup>	1
Haul Trucks 90 mt	10
Rotary Drill 17-27 cm	3
Dozer 305 kW	3
Grader 140 kW	1
Anfo Truck	1
Explosive Truck (cap)	1
Water Truck	1
Service Truck (for maintenance)	2
Lube/Fuel Truck	3
Loader (Yard Handling)	1
Pickup Truck	10
Bus (for people transportation)	1
Light Plants 10 kW	4
Concrete Truck	1
Zoom Boom	1

As discussed previously, a mining contractor would be hired in order to assist with high waste mining requirements from years 3 to 6 inclusively. The contractor mine fleet capacity was planned to be the same as the owner fleet capacity as the total material moved during these four years is approximately doubled. Therefore, the contractor mining fleet is as in the table above for the loading, hauling and drilling equipment, and for some support equipment.

### MINE INFRASTRUCTURE AND SERVICES

This section is dedicated to infrastructure directly associated with mine operations. For all other general infrastructure located at surface, see Section 18 (Project Infrastructure).

### **MATERIAL HANDLING**

The mineralized material and waste will be hauled out of the pit with the off-highway equipment fleet listed previously. The waste will be transported to the waste dump, located west of the open pit. The REE bearing material (mill feed) will be delivered directly into the primary crusher or stockpiled nearby. Crushing will be performed prior to feeding the process plant.



### **DEWATERING**

The dewatering system will comprise dewatering wells surrounding the open pit footprint. A pumping network will also be installed to pump water run-off from the open pit (three 75-kW pumps).

Pumped water from all sources will be directed through the water treatment system comprised of settling/polishing ponds prior to its release into the environment.

### **EXPLOSIVES AND DETONATORS**

Detonators and explosives will be stored in approved explosives magazines. They will be located at a safe distance from the mining operations.

The explosives and detonators magazines will be located southwest of the open pit, along the haul road to the waste dump, and far enough from buildings and working areas. The selected site is shown on Figure 16-2.

Suppliers will deliver explosives and detonators directly into dedicated magazines for storage until use.



# 17 RECOVERY METHODS

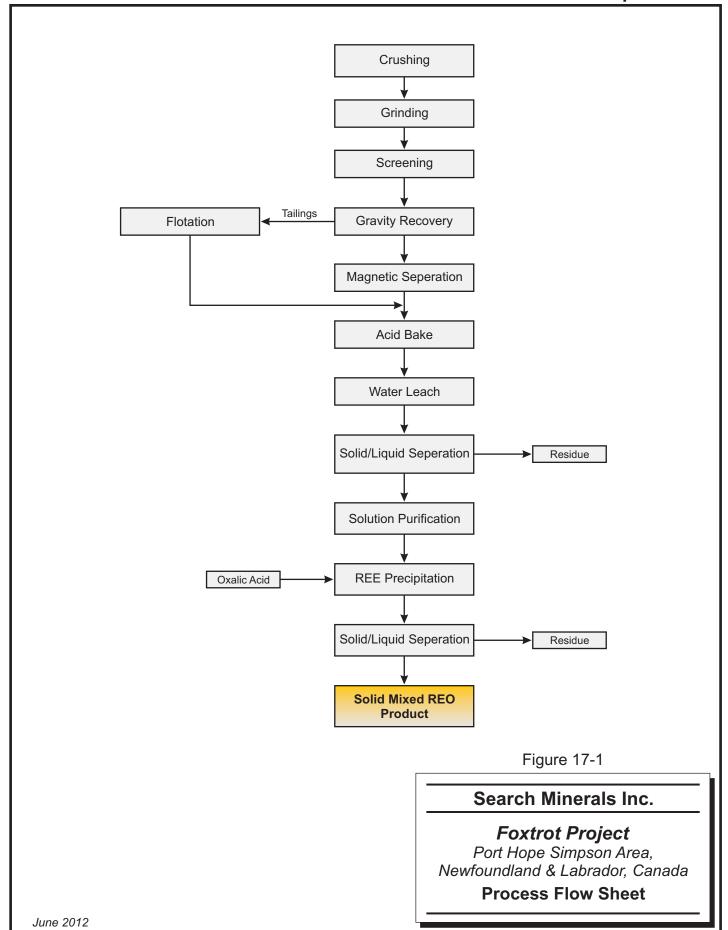
### PRELIMINARY PROPOSED PROCESS

The process will utilize the following basic unit operations: crushing, grinding, gravity recovery, magnetic separation, flotation, water leaching, acid bake, and solution purification to recover a mixed REE product, as shown below in Figure 17-1.

Ore will be crushed, ground and screened to produce a suitable sized product for gravity recovery. Gravity recovery unit operations may include tabling to produce separate sized material. The product from the tabling operation will be subjected to magnetic separation to remove magnetite. The tailings from the gravity recovery step will be subjected to flotation to increase REE recovery.

The non-magnetics from magnetic separation, and the flotation concentrate will be combined and sent to acid baking, and then to a water leaching step. The product from water leaching will go to solid liquid separation, with the REE containing solution sent to solution purification, and the solids sent to residue disposal. After solution purification, oxalic acid will be added to the remaining solution to form REO containing precipitate. This precipitate will be sent to solid/liquid separation to provide a solid mixed REO product, and a liquid residue.







# 18 PROJECT INFRASTRUCTURE

The surface infrastructure area totals 400 ha and covers two watersheds. It has been assumed that except for the waste stockpile drainage the project infrastructure, including mine water discharge for the mine, will be located at the northern watershed.

### **POWER SUPPLY**

Hydroelectric power is not available near the mine site. Power at Goose Bay is fed by a main power line coming from Churchill Falls but the straight distance between Goose Bay and the mine site is more than 300 km. Diesel driven generators will be installed at the mine site near the process plant. Maximum power demand will be on the order of 8 MW. The electric line network will be approximately eight kilometres in length and will supply the process plant, accommodation camp, pumping stations, mechanical shop, warehouse, service buildings, and site lighting.

A preventive maintenance program for diesel driven generators must be set up and carefully followed by mine site maintenance personnel and an emergency backup system will always have to be operational.

### **FUEL STORAGE**

A central fuel storage system comprising two 900 m<sup>3</sup> diesel storage tanks contained within a bunded area will be installed adjacent to the process plant and close to the mine services area. This fuel storage will mainly supply diesel driven generators and refuelling requirements for the mine fleet and light vehicles.

### **WATER SUPPLY**

It is anticipated that raw water for process plant use will be sourced mainly from the tailings storage facility (TSF) polishing pond and a natural pond located south side of TSF. The main objective will be to maximize the amount of reused water for processing and use fresh water only when necessary.

It has been assumed that the accommodation camp will be supplied with fresh water, treated for potable use, from a bore hole located in close proximity to the site.



Water for fire hydrants will be supplied from a natural pond located at the south side of the TSF. The water will be pumped to a tank dedicated for fire emergencies. Six fire hydrants will be connected by a 200 mm diameter HDPE pipe and will be used to provide fire protection around the mine site.

### **ROADS**

The site is located 500 m to the south of a public road which provides access to the small community of St-Lewis. It is anticipated that the 12-km road going to St-Lewis will require upgrades.

Approximately 10 km of road on site is required for the mining operation and to access site buildings. The travelling road has a planned 10 m width and radius of curvature of 200 m minimum and the production road from open pit to ROM pad and waste pad has a planned 20 m width and radius curvature of 250 m minimum. Waste coming from the open pit will be used as material to build the road base and after grinding-screening could be used as a rolling surface.

### **PARKING LOT**

Two parking lots are planned for the Project. The capacity of the first one, located at the security gate, is planned to provide 40 spaces for visitors and personal cars of the workforce. The second parking lot, near mechanical shop, has a planned capacity of 50 spaces and will be used for production mobile equipments. The parking lots will be constituted by one metre of waste and 200 mm of granular material.

### **BUILDINGS**

The following buildings are the major buildings located at the mine site. All buildings will be in steel frame metal clad construction-type with a concrete slab base. It is assumed that the foundations will be built on the bed rock with a minimum amount of filling material needed.

- Administration and Services Office
- Mill and concentrate loading/shipping installation
- Primary Crushing Plant
- Mechanical and Electrical Shop
- Warehouse
- Accommodation camp
- Main security gate house



### Community relations

### ADMINISTRATION AND SERVICES OFFICE

The administration and services office building will accommodate mine management, administration, engineering/geology department, first aid room, training and meeting rooms, and a mine dry room. The building will be two storeys and completed in modules. Costs include the complete supply and installation of building foundations, mechanical equipment, and electrical equipment.

### GARAGE, MAINTENANCE SHOPS AND WAREHOUSE

The garage will include a wash bay, five mechanical bays, and a welding shop. Four other shops adjacent to the garage and the main warehouse will be added for welders, carpenters, pump and accessories maintenance, and for electrical and instrumentation workers. There will be two levels in the warehouse with maintenance on the lower floor and parts storage and a dining room on the upper floor. In the electrical equipment maintenance local, a second floor will be occupied by maintenance foreman offices.

### **ACCOMMODATION CAMP - OPERATIONS**

An accommodation camp will be constructed west of the plant site to house the permanent mining and process plant workforce. It is expected that this camp will have a total capacity of approximately 210 people. There will be sleeping rooms, a kitchen/dining facility, clinic, laundry, and recreation facilities.

### **ACCOMMODATION CAMP - CONSTRUCTION**

Temporary accommodation for the construction phase will be located adjacent to the permanent camp site. The temporary camp will be removed upon completion of construction.

### OTHER SITE INFRASTRUCTURE

Communications services for the Project will include voice (via existing commercial incountry cell phone systems), data/internet communications via satellite, and satellite cable services for television entertainment.

### **WASTE ROCK DUMP**

The waste pile will be located one km west of the open pit and will have a maximum capacity of approximately 63 million m<sup>3</sup> and a maximum height of 75 m.



### **TAILINGS DYKE**

The tailings will be stored in a conventional tailings storage facility (TSF). The TSF concept is based on the assumption that the bedrock is impermeable and that the tailings are non-acid producing. Tailings will be transported through a 5-km HDPE pipe (250 mm ID).

The TSF will ultimately cover a maximum area of 90 ha. Location of the TSF is shown in Figure 18-1. The dyke, anticipated to be constructed using ROM waste, will have the capacity to enclose 6 million m³ of tailings and will require 1.5 million m³ of rock fill for construction.

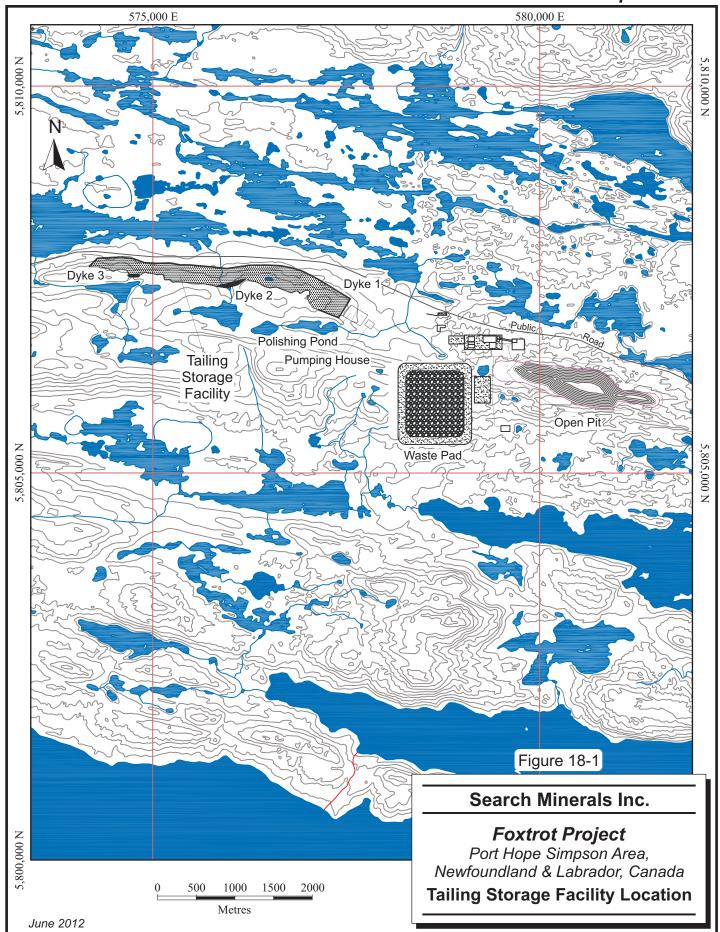
### **PORT**

The infrastructure facilities at the port at St-Lewis will require upgrades, including the construction of a cold shed and concentrate storage facility. Sea containers, concentrate, and consumables delivered to port are assumed to be handled by the mine personnel.

### **AIRPORT**

Aircraft will be based on Dash 8 Series 300, Q400 or other type of aircraft having a capacity of at least 55 passengers needing a minimum airstrip length of 1.3 to 1.6 km; the current landing runway is 700 m in length. Therefore the current airstrip of St-Lewis must be upgraded or relocated.







### 19 MARKET STUDIES AND CONTRACTS

### RARE EARTHS

RPA collected historical price information, supply/demand analysis, and long term forecasts for REO. The sources of price information include the websites of Metal-Pages<sup>TM</sup> and Asian Metal, and analyst reports by Asian Metal, TD (Toronto Dominion) Newcrest Inc., and CIBC (Canadian Imperial Bank of Commerce).

### RARE EARTH SUPPLY

Rare earths are found in more than 200 minerals, of which about a third contain significant concentrations. Only a handful, however, have potential commercial interest. The most important source minerals are carbonates (bastnaesite) and phosphates (monazite and xenotime). Apatite is also an important source of rare earths, while heavy rare earths are more commonly found in minerals in granitic and alkaline rocks and in ionic clays. The main geological environments for rare earths are:

- Carbonatites bastnaesite (Mountain Pass, California; Kola Peninsula; Russia, Sichuan, China)
- Monazite and xenotime-bearing placers (west coast of Australia; east coast of India)
- Iron-bastnaesite rare earth element deposits (Bayan Obo, Inner Mongolia; Olympic Dam, Australia)
- Ion absorption clays (Longnan, Jiangxi, China)
- loparite and eudialyte in alkaline intrusives (Kola Peninsula, Russia; Dubbo, Australia)
- Pegmatites, hydrothermal quartz and fluorite veins (Northern Territories, Australia; Karonge, Burundi; Naboomspruit, South Africa)

Other generic types which may contain rare earths are:

- Phosphates (Phosphoria Formation, western USA),
- Uranium deposits in sandstone and black shales (Wheeler River, Alberta; Williston Basin, Saskatchewan),
- Mylonites in limestones (Nam-Nam-Xe, Vietnam),



- Scheelite skarns (Ingichke, Uzbekistan),
- Nickel deposits (Sudbury Basin, Ontario).

By far the most important current sources of rare earths are the Bayan Obo iron rare earth deposits near Baotou, Inner Mongolia, the bastnaesite deposits in Sichuan, China and the ionic clay deposits in southern China. China is the dominant source of all rare earth oxides, accounting for approximately 97% of world production in 2009. Light rare earths are primarily produced in northern China (Inner Mongolia) and south-western China (Sichuan). The heavy rare earths are primarily produced in southern China (Guangdong), from ionic clays.

There are distinct differences in the elemental composition of various rare earth sources, as illustrated in Table 19-1.

TABLE 19-1 DISTRIBUTION OF RARE EARTHS BY SOURCE – CHINA Search Minerals Inc. – Foxtrot Project

Source	Baotou, Inner Mongolia	Sichuan	Guangdong	Longnan, Jiangxi	Mountain Pass, Ca	Mt. Weld, W. Australia <sup>1</sup>
Ore Type	Bastnaesite Concentrate	Bastnaesite Concentrate	High-Eu clay	High-Y clay	Bastnaesite	Monazite
TREO in Concentrate <sup>2</sup> Element	50%	50%	92%	95%		
La	23	29.2	30.4	2.1	33.2	25.5
Ce	50.1	50.3	1.9	0.2	49.1	46.74
Pr	5	4.6	6.6	0.8	4.34	5.32
Nd	18	13	24.4	4.5	12	18.5
Sm	1.6	1.5	5.2	5	0.789	2.27
Eu	0.2	0.2	0.7	0.1	0.118	0.44
Gd	0.8	0.5	4.8	7.2	0.166	1
Tb	0.3	0	0.6	1	0.0159	0.07
Dy	0	0.2	3.6	7.2	0.0312	0.12
Er	0	0	1.8	4	0.0035	0.1
Υ	0.2	0.5	20	62	0.0913	trace
Ho-Tm-Yb-Lu	8.0	0	0	5.9	0.0067	trace
Total TREO	100	100	100	100	99.9	100

<sup>&</sup>lt;sup>1</sup>Central Zone pit assays for La, Ce, Pr, Nd, Sm, Dy, Eu, and Tb

<sup>&</sup>lt;sup>2</sup>TREO contents of China clays represent the relative amounts in concentrate produced from the clay deposits Source: Neo-Materials International, Harben, Lynas Corp.



As a consequence of the mix of the individual elements within a raw material source, the distribution of supply of the individual elements does not match the distribution of demand for the elements. The mixed composition of rare earth minerals necessitates the production of all of the elements within a given ore source. Such production does not necessarily equal the demand for the individual oxides, leaving some in excess supply and others in deficit. Overall production of rare earths on an oxide basis is therefore typically greater than the sum of demand for the individual elements in any given year.

Total supply of rare earth oxides for 2010 was estimated at between 123,600 tonnes and 124,000 tonnes, as illustrated in Table 19-2.

TABLE 19-2 RARE EARTH SUPPLY – 2008 & 2010 Search Minerals Inc. – Foxtrot Project

Source		Supply 2008 (tonnes REO)	Supply 2010 (tonnes REO)
China	117,000 120,000		120,000
Others			
	Recycling	~5,000	N/A
	Russia	2,500 - 3,000	1,800 - 2,000
	India	100	25 - 50
	Mountain Pass	2,000	1,800 – 2,000
Total		121,600 - 127,100	123,600 – 124,000

Source: Roskill Information Services, 2010 & 2011

As described by Asian Metal, the international rare earths market has grown at an unprecedented rate since China cut export quotas by approximately 40% in 2011 as seen in Figure 19-1. China's overwhelming control on the rare earth supply chain, from upstream mining to downstream processing and end-user products, is likely to remain intact on all but a few materials through 2016. Further price increases are expected with continued decreases in export availability from major Chinese suppliers and a surge in domestic China demand.

2010

2011 (estimated)



0

Source: Asian Metal

2005

2006

2007

70 65.6 60 61.8 59.6 50 40 40 30.3 28

FIGURE 19-1 CHINESE RARE EARTH EXPORT QUOTAS BY YEAR (THOUSANDS OF TONNES)

A crackdown on illegal mining operations, which accounted for an estimated 20% to 25% of production over the past five years, has substantially cut down on the availability of material on the spot market. A major consolidation of the market, which began in 2009, has also limited the number of active rare earth miners, separation plants, and exporters in China.

2008

2009

New production from US-based Molycorp and Australia-based Lynas should add between 30,000 tons (27,000 tonnes) and 40,000 tons (36,000 tonnes) of high purity material to the market by the end of 2012, which is widely expected to saturate the light rare earths market when it becomes available. The ore bodies from Molycorp's Mountain Pass and Lynas' Mount Weld mine sites are predominantly composed of light rare earths - lanthanum, cerium, praseodymium, and neodymium. The heavy rare earths and yttrium are found at the mines only in trace amounts and will be neither recovered nor produced in quantities that would have a material impact on global supply.

It should be noted that the heavy rare earths – Dy, Er, Eu, Gd, Ho, Lu, Sc, Sm, Tb, Tm, Y, Yb – are not only much more rare than the light rare earths, but the separation and processing of heavy rare earth-rich concentrate into high purity oxides and metals outside of China will require substantial new capital investment. At present, substantially all heavy rare earth processing facilities are in China, and previous scoping studies done by prospective rare earth mining ventures indicate that a new separation plant would



cost roughly US\$250 million to US\$350 million and take three to four years to complete. As a result, availability of heavy rare earths will be contingent on Chinese production levels until 2015 at the earliest - the soonest a non-Chinese processing facility could be completed.

On a macro level, over the next five years, the Chinese government is expected to further regulate the rare earth mining industry. China has already begun enacting a series of new policies designed to improve environmental guidelines, limit illegal production, establish provincial and national stockpile reserves, and continue a consolidation of the overall industry.

### RARE EARTH PRICING

The market for rare earth products is relatively small, and information on pricing and sales terms, especially for 2016, is difficult to obtain. Sustained growth in demand and price is expected for nearly all rare earths through 2016 with the exception of lanthanum, cerium, and praseodymium.

REO price forecasts for 2016 were obtained from a number of sources, which covered a wide range of values. The prices used in the PEA cash flow are described in Table 19-3, below. The prices were applied as a constant throughout the Life of Mine (LOM) schedule.



TABLE 19-3 REO FORECAST PRICES VS. CURRENT SPOT PRICES Search Minerals Inc. – Foxtrot Project

Rare Earth Oxide	Base Case (US\$/kg)	FOB China Q2 2012 Spot* (US\$/kg)
Ce <sub>2</sub> O <sub>3</sub>	5	25
$La_2O_3$	10	24
$Nd_2O_3$	75	175
$Pr_2O_3$	75	140
$Sm_2O_3$	9	90
$Eu_2O_3$	500	2,300
$Gd_2O_3$	30	100
$Sc_2O_3$	3,000	7,200
$Y_2O_3$	20	132
$Yb_2O_3$	50	90
$Dy_2O_3$	750	1,100
$Er_2O_3$	40	195
$Ho_2O_3$	-	-
$Lu_2O_3$	-	-
Tb <sub>4</sub> O <sub>7</sub>	1,500	2,000
$Tm_2O_3$	-	<del>-</del>

<sup>\*</sup> Source: Metal-Pages.com

The average rare earth oxide price used in this PEA is \$38/kg, while current (Q2 2012) prices average C\$99/kg.

### MARKETING CONCLUSIONS

RPA considers these REO prices to be appropriate for a PEA-level study, however, we note that the recent market volatility introduces considerably more uncertainty than a comparable base or precious metals project.

### **CONTRACTS**

No contracts relevant to the PEA have been established by Search Minerals. Search Minerals has not hedged, nor committed any of its production pursuant to an off-take agreement.



# 20 ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL OR COMMUNITY IMPACT

### **ENVIRONMENTAL STUDIES**

### **ENVIRONMENTAL BASELINE STUDY**

It is expected that a Newfoundland and Labrador Environmental Impact Statement (EIS) and a Federal Comprehensive Study will be required for the Foxtrot Project. An Environmental Baseline Study (EBS) will be completed to support these environmental assessments.

To date, no EBS's have been conducted at the Foxtrot Property. An EBS is necessary to understand the specific interactions between the project and the natural environment and to design the project to avoid or minimize potential adverse effects. The EBS would also support the preparation of a registration document for the project and an EIS in the event that it is required by the province (detailed below). An EBS is typically conducted over a minimum of 12 continuous months to provide coverage of all four seasons. Studies may continue beyond this12-month period as may be justified by the occurrence of abnormal seasonal conditions. In cases where the EBS may focus on specific information gaps the study period may be shorter than 12 months. The EBS scope is typically developed in consultation with the local and regional resource management and regulatory agencies in order to ensure agency concerns can be addressed with the study results. The initial EBS report is typically completed within 14 to 16 months of the start of the field program and the Environmental Impact Assessment (EIA) is typically based upon this initial EBS report.

The following environmental baseline studies are likely required:

- Sound monitoring;
- Air quality;
- Historic and heritage sites;
- Fish and fish habitat baseline;
- Rare plant analysis;



- Ecological land classifications (ELC) including wildlife assemblages and wetlands; and
- Song birds.

Determination of Harmful Alteration, Disruption, or Destruction of Fish Habitat (HADD) and socio-economic baseline studies will also be undertaken.

### PROJECT PROCESS AND PERMITTING

Mining projects in the Province of Newfoundland and Labrador are subject to Environmental Assessment (EA) under the Newfoundland and Labrador Environmental Protection Act. They can also be subject to an environmental assessment under the Canadian Environmental Assessment Act (CEAA) if an approval is required from a federal agency. All provincial and federal EA processes are public. These processes are discussed below:

### PROVINCIAL PROCESS

The EA process is initiated with a formal registration of the Project, submitted in a prescribed format, to the Newfoundland and Labrador Department of Environment and Conservation. The registration is made available to the public and to government agencies for review. Within 45 days of receiving a registration, the Minister will issue a decision on the proposed project. All decisions are announced in the Environmental Assessment Bulletin. There are three possible decisions:

- An Environmental Preview Report is required;
- An Environmental Impact Statement is required; or
- No further EA is required.

### **ENVIRONMENTAL PREVIEW REPORT**

An Environmental Preview Report (EPR) is ordered by the Minister when additional information is required to determine the potential for a project to result in significant adverse environmental effects. The project proponent is responsible to prepare a project-specific EPR, in response to government-issued guidelines. The EPR is available for public and government review. At the completion of the review period, the Minister decides if the EPR is sufficient. If not, the proponent is required to revise and/or amend



it. Upon a determination of sufficiency, the Minister will release the project, conditionally release the project, or call for an Environmental Impact Statement (EIS).

### **ENVIRONMENTAL IMPACT STATEMENT**

An EIS is required in cases where potential exists for a project to cause significant adverse environmental effects. The project proponent is responsible to prepare a project-specific EIS and associated component studies in response to government issued guidelines. Field work is typically required for the completion of an EIS. The component studies and EIS are available for public and government review. At the completion of the review period, the Minister decides if the component studies and/or EIS are sufficient. If not, the proponent is required to revise and/or amend the document. Upon a determination of sufficiency, Cabinet will release the project, conditionally release the project, or not release the project. Once the project is released from the EA process and prior to project construction, the proponent can proceed to obtain the necessary permits and authorizations. A release from the provincial process is valid for three years.

### **PERMITTING**

Proponents should follow the *Environmental Guidelines for Construction and Mineral Exploration Companies* (DNR, 2011) provided by the Newfoundland and Labrador Department of Natural Resources. The *Guidebook to Exploration, Development and Mining in Newfoundland and Labrador* (GNL, 2010) also provides useful guidance on the regulatory process.

### WATER QUALITY MANAGEMENT

Although no water balance has been completed for the Project, the discharge of effluents is probable. Discharges may originate from several sources, including open pit dewatering, groundwater seepage, precipitation, and general site run-off, including run-off from ore, waste rock, and overburden stockpiles; and, periodic releases of water from the tailings management area. As such a water treatment plant will likely be required to manage the quality of water being discharged into the environment.

The control and management of water resources in Newfoundland and Labrador is legislated by the Water Resources Act, although related development activities cannot be permitted or undertaken without first obtaining authorization from the Province under the Environmental Protection Act.



### SURFACE WATER

Licences under the Water Resources Act will be required prior to release of any effluent. Effluents discharged to surface water from mining activities must, at minimum, comply with Sections 3, 19.1, and 20 of the MMER (Table 20-1). Site specific effluent quality criteria may be imposed as a condition of any approval in the event that compliance with the MMER does not provide adequate protection of receiving water quality. Effluent treatment is expected to be required to meet effluent quality limits for TSS, ammonia, and potentially for management of metal concentrations. Specific treatment requirements will be developed in subsequent Project planning phases.

Monitoring of any liquid discharge from the Project to receiving waters will be required as part of any provincial environmental permit or approval. The basic monitoring requirements are those detailed in the MMER, which require routine monitoring of deleterious substances (Table 20-1) and effluent volume. Periodic effluent characterization also is required, which includes the deleterious substances and analyses of alkalinity, hardness, aluminum, cadmium, iron, mercury, molybdenum, ammonia, nitrate, major anion and cation species, and Project-specific contaminants of concern (COC). The MMER also require periodic receiving water quality monitoring, and environmental effects monitoring.

Neither the process water requirement for the mill or the water source has been determined at this time, however, water usage from any natural surface water body will need to be licensed under the *Water Resources Act*.

### **GROUNDWATER**

Hydrogeological conditions in the vicinity of the open pit need to be studied in order to estimate the potential for groundwater seepage into the pit, to design the necessary water diversion and water management works, and to assess how the Project interactions with groundwater may affect nearby surface water bodies. Any dewatering will be required to be licensed under the *Water Resources Act*.



# TABLE 20-1 METAL MINING EFFLUENT REGULATIONS, SOR/2002-222 – AUTHORIZED LIMITS OF DELETERIOUS SUBSTANCES Search Minerals Inc. – Foxtrot Project

Deleterious Substance	Maximum Authorized Monthly Mean Concentration	Maximum Authorized Concentration in a Composite Sample	Maximum Authorized Concentration in a Grab Sample
Arsenic	0.50 mg/L	0.75 mg/L	1.00 mg/L
Copper	0.30 mg/L	0.45 mg/L	0.60 mg/L
Cyanide	1.00 mg/L	1.50 mg/L	2.00 mg/L
Lead	0.20 mg/L	0.30 mg/L	0.40 mg/L
Nickel	0.50 mg/L	0.75 mg/L	1.00 mg/L
Zinc	0.50 mg/L	0.75 mg/L	1.00 mg/L
Total Suspended Solids	15.00 mg/L	22.50 mg/L	30.00 mg/L
Radium 226	0.37 Bq/L	0.74 Bq/L	1.11 Bq/L

Note: All concentrations are total values.

Cyanide only required for mines using cyanide in the metallurgical process.

Current version as posted between Apr 3, 2009 and Apr 15, 2009. SOR/2006-239, s. 25.

Source: Department of Justice 2011

### **OTHER PERMITS**

### Mining Lease

A mining lease must be obtained under the provincial *Mineral Act* for exclusive rights to develop, extract, remove, deal with, sell, mortgage, or otherwise dispose of all the unalienated materials, or those specified in the lease, in, on or under the land described in the lease (GNL, 2010),. Surface rights that include the entire footprint of the mine and related infrastructure must also be obtained under the *Mineral Act*.

### Mill License

A mill license is required for operation of a mill in conjunction with a mining operation, as per Section 5 of the *Mining Act*. Mill licenses are issued by the Department of Natural Resources to the holder of a mining lease (GNL, 2010), and a mill may not be operated without first obtaining a mill license.

### **Fuel Storage and Handling**

Fuel storage and handling in Newfoundland and Labrador is regulated by *The Storage* and *Handling of Gasoline & Associated Products Regulations*, and a Certificate of Approval for a fuel storage system must be obtained from the Department of



Government Services and Lands. Registration is required for all underground and above ground storage facilities for the storage and handling of fuel and associated products.

### **Explosives**

Explosives must be stored at least 22.86 m from any road and 30.48 m from an occupied building. Explosives in excess of 68.04 kg can be kept only on premises which have been licensed under *The Explosives Act* (Canada). All transportation of explosives must conform to *The Fire Commissioners Act* and *The Explosives Act* (Canada). Permits related to explosives are often held by the explosives supplier in circumstances where the onsite storage facilities are owned and operated by the supplier.

### FEDERAL PROCESS

### **ENVIRONMENTAL ASSESSMENT**

Any requirement for a federal environmental assessment would be conducted in accordance with the Draft Canada-Newfoundland and Labrador Agreement on Environmental Assessment Cooperation (2005). The Provincial government and CEA Agency will advise proponents at the earliest opportunity about the potential for a cooperative environmental assessment of a proposed project.

### CANADIAN ENVIRONMENTAL ASSESSMENT ACT

The Project registration document will be circulated to the Canadian Environmental Assessment (CEA) Agency and to federal authorities such as Environment Canada, Health Canada, Fisheries and Oceans Canada, Natural Resources Canada and Transport Canada. The federal agencies will determine if a federal environmental assessment is necessary. A federal environmental assessment is typically triggered when a federal authority determines it must provide a license, permit or an approval that enables a project to be carried out (e.g., authorization under the federal *Fisheries Act*).

If a federal agency determines that it must issue a permit or approval for the Project, the federal agency would then determine the level of environmental assessment to be applied to the Project. The level of environmental assessment that is necessary for a mining operation in the presence of a CEAA trigger is determined by a number of factors which are outlined in the *Comprehensive Study List Regulations* under CEAA. The basic level of assessment is the screening level. The next level is the comprehensive study, which is typically applied to larger and more complex Projects. In general, a metal mine



with a planned production rate of 3,000 tpd or greater is subject to a comprehensive study.

The proposed Project is considered a natural resource development which triggers involvement of the Major Project Management Office (MPMO) to provide overarching project management for a federal environmental assessment if required. The MPMO is administered by Natural Resources Canada, whose role is to provide guidance to project proponents and other stakeholders, coordinate project agreements and timelines between federal departments and agencies, and to track and monitor the progression of major resource projects through the federal regulatory review process.

### FISHERIES ACT

Fisheries and Oceans Canada (DFO) is responsible for protecting fish and fish habitat in Canada. Under section 35(1) of the federal *Fisheries Act*, works that result in the harmful alteration, disruption or destruction (HADD) of fish habitat must be authorized in advance by DFO, (DFO 2002). If a DFO Authorization is required, it can take anywhere from one month to several years to obtain an Authorization, depending on the type of approval required, the complexity of the project, and any associated field studies. Other Project activities (e.g., construction of crossing structures [culverts] through fish habitat, any work in or about a fish-bearing watercourse that may disturb, alter or destroy fish habitat) will require an Authorization under the Fisheries Act if they result in a HADD. Habitat compensation is an option for achieving no net loss when residual impacts on habitat productive capacity are deemed harmful after relocation, redesign or mitigation options have been implemented. Habitat compensation involves replacing the lost habitat with newly created habitat or improving the productive capacity of some other natural habitat. Depending on the nature and scope of the compensatory works, habitat compensation may require (but is not limited to) five years of post-construction monitoring (DFO 2002).

### PROVINCIAL AUTHORIZATIONS

Following release from the multi-jurisdictional environmental assessment process, the Project will require a number of approvals, permits, and authorizations prior to Project initiation. In addition, throughout Project construction and operation, Search Minerals will also be required to comply with any other terms and conditions associated with the release issued by the regulatory jurisdictions. Preliminary lists of permits, approvals, and



authorizations that may be required for the Project are presented in Table 20-2. Permits and authorizations will also be required from affected municipalities.

# TABLE 20-2 PROVINCIAL AUTHORIZATIONS Search Minerals Inc. – Foxtrot Project

Permit, Approval or Authorization Activity	Issuing Agency
Release from Environment Assessment Process	DOEC - Environmental Assessment Division
Permit to Occupy Crown Land	DOEC - Crown Lands Division
Permit to Construct a Non-Domestic Well	DOEC - Water Resources Management
Water Resources Real-Time Monitoring	Division
Certificate of Environmental Approval to Alter a Body of	
Water	
Culvert Installation	
Fording	
Stream Modification or Diversion	
. Other works within 15 metres of a body of water (site	
drainage, dewater pits, settling ponds)	
Certificate of Approval for Construction and Operation	DOEC - Pollution Prevention Division
Certificate of Approval for Generators	
Industrial Processing Works	
Approval of MMER Emergency Response Plan	
Approval of Waste Management Plan	
Approval of Environmental Contingency Plan (Emergency)	
Spill Response)	
Approval of Environmental Protection Plan	
Permit to Control Nuisance Animals	DOEC - Wildlife Division
Pesticide Operators License	DOEC - Pesticides Control Section
Blasters Safety Certificate	Government Service Centre (GSC)
Magazine License	
· Approval for Storage and Handling Gasoline and	
Associated Products	
Temporary Fuel Cache	
Fuel Tank Registration	
· Approval for Used Oil Storage Tank System (Oil/Water	
Separator)	
Fire, Life and Safety Program	
Certificate of Approval for a Waste Management System	
Approval of Development Plan, Closure Plan, and	Department of Natural Resources (DNR) -
Financial Security	Mineral Lands Division
Mining Lease	
Surface Rights Lease	
Quarry Development Permit	
Operating Permit to Carry out an Industrial Operation	DNR - Forest Resources
During Forest Fire Season on Crown Land	
Permit to Cut Crown Timber	
Permit to Burn	
Storing, handling, and transportation of dangerous goods	1



### SOCIAL OR COMMUNITY REQUIREMENTS

### COMMUNITY AND ABORIGINAL ENGAGEMENT

The implementation of an effective community and Aboriginal engagement program is fundamental to the successful environmental permitting of mining projects. The purpose of this program is to ensure that all potentially affected persons, businesses, and communities have a full understanding of the Project and an opportunity to share information with respect to concerns regarding potential effects, and so the proponent has an opportunity to explain how these concerns are addressed in the Project design and operations. This program typically begins in the early stages of project planning and continues through the life of the Project.

The community engagement phase of the Project will ideally be initiated as early as possible and requires very careful thought and planning. Evidence of community engagement is required throughout the provincial and federal environmental assessment processes. If mining plans are likely to change as the Project progresses, it is important to keep the community well informed.

Consultation with Aboriginal groups should also be initiated as early as possible.

In addition to a continuing public engagement program, it may be necessary to negotiate an impact/benefit agreement (IBA) with potentially affected stakeholder groups in order to, in part, address potential adverse effects of the Project on traditional resource users. These agreements can take many forms and no single formula is applicable to all situations. However, the agreements typically lay out various forms of economic stimulation or benefit specifically designed and intended to benefit specific affected stakeholder groups.

### MINE CLOSURE REQUIREMENTS

### REGULATORY REQUIREMENTS

The Rehabilitation and Closure Plan is a provincial requirement of the Newfoundland and Labrador Mining Act, Chapter M-15.1, Sections (8), (9) and (10). Under the Mining Act, the "Rehabilitation and Closure Plan" is defined as a plan which describes the process of rehabilitation of a project at any stage of the project up to and including closure. Rehabilitation is defined as measures taken to restore the property as close as



is reasonably possible to its former use or condition or to an alternate use or condition that is considered appropriate and acceptable by the Department of Natural Resources.

### REHABILITATION AND CLOSURE PLAN SUBMISSION AND REVIEW

A formal Rehabilitation and Closure Plan is required to obtain approval for project development under the Mining Act. This plan is required to be submitted with or immediately following the submission of the Project Development Plan and provides the basis for the establishment of the Financial Assurance for the Project. The Mining Act requirements will only be reviewed by NLDNR following release of the project from Environmental Assessment and the review and approval process can typically take four months to one year.

The Rehabilitation and Closure Plan is directly linked to mine development and operation over the life of a mine and therefore must be considered a "live" document. It is common practice in the industry to review and revise the Rehabilitation and Closure Plan throughout the development and operational stages of the Project. The process of reviewing and updating the Plan commonly occurs on a five year cycle after the start of operations, however, the review cycle is typically established on a site by site basis. The final review of the Rehabilitation and Closure Plan generally occurs once the mine closure schedule is known (typically 12 months or more before end of mining). This final review forms a Closure Plan which defines in detail the actions necessary to achieve the Rehabilitation and Closure objectives and requirements. This Plan utilizes the actual site conditions and knowledge of the operation of the site and can therefore provide specific reference to activities and goals.

### **DESIGN AND IMPLEMENTATION**

### **OBJECTIVES OF THE REHABILITATION AND CLOSURE PLAN**

There are three stages of rehabilitation activity that occur over the life of a mine:

- 1. Progressive rehabilitation
- 2. Closure rehabilitation
- 3. Post closure monitoring and treatment

Progressive rehabilitation is considered to include rehabilitation completed, where possible or practical, throughout the mine operation stage, prior to closure. This would



include activities that would contribute to the rehabilitation effort that would otherwise be completed upon cessation of mining operations (closure rehabilitation). Closure rehabilitation would include the measures, remaining after progressive rehabilitation activities, required to fully restore or reclaim the property as close as reasonably possible to its former condition or to an approved alternate condition. This would include demolition and removal of site infrastructure, vegetation, and all other activities required to achieve the requirements and goals detailed in the Program.

Upon completion of the closure rehabilitation activities, a period of 'post-closure monitoring' is then required to ensure that the rehabilitation activities have been successful in achieving the prescribed goals. At this stage of rehabilitation, some treatment requirements may continue until the natural baseline conditions are restored and these conditions would then persist without need for additional treatment. Once it can be demonstrated that practical rehabilitation of the site has been successful, the site should be closed-out or released by the Regulatory authority and the land relinquished to the Owner or the Crown.

The overall objectives proposed for the Project site should include:

- Restoration of the health and fertility of the land to a self-sustaining, natural state
- Provision of an agreeable habitat for wildlife (including fish) in a balanced and maintenance free ecosystem
- Creation of a landscape which is visually acceptable and compatible with surrounding terrain
- Mitigation and control to within acceptable levels, the potential sources of pollution, fire risk, and public liability
- Outline and undertake the studies and/or planning to be completed during the operations period to allow for detailed Closure planning to proceed without delay at the cessation of mining
- Provide a safe environment for long term public access

The natural and existing characteristics of the site which provide the basis for the Plan design include physical stability and chemical stability.



### PHYSICAL STABILITY

The closure plan must address the physical stability aspect of the mine site components which remain after operations have ceased. In the case of the Foxtrot Project, these components will likely include the open pit, waste dumps, tailings containment dams, overflow channels, and construction features associated with buildings and site infrastructure. The closure plan must consider the deterioration of site components over the long term, by perpetual forces such as precipitation, wind, chemical weathering, and seismic events.

### CHEMICAL STABILITY:

It is necessary to ensure long-term chemical stability of the rehabilitated mine site. Design of the closure plan must contain appropriate methods to ensure that on-site water, drainage, and surface run-off from the site meet acceptable water quality standards.

### NATURAL AESTHETIC REQUIREMENTS

Visual impact of the mine site is an important consideration in terms of its existing non-compatibility with the surrounding landscape. The Plan will ultimately result in the removal and/or capping, and vegetation of the majority of the physical features and structures associated with operations.

### **VEGETATION AND WILDLIFE**

Closure plan design must ensure that vegetation will be self-sustaining over the long term by being compatible with on-site soil and local climatic conditions. Establishment of vegetation should facilitate the natural recovery of the area for use by local wildlife.

Closure plan should ensure that disturbed areas of the site requiring rehabilitation, such as roadways, building foundation areas, storage pads and storage area bases, are suitably prepared either by scarification to loosen the soil, and/or loosened and covered with a cap of local till prior to vegetation. Concrete structures and foundations will be removed or buried under a suitable cover of till to permit vegetation growth.

Vegetation will be established through proper site preparation and encouragement of natural vegetation or planting. The selected method will depend upon location of the disturbed area, anticipated time for natural succession and the requirement for



immediate erosion and sedimentation control through provision of a vegetation cover. In all cases, the primary objective of vegetation is to stabilize the soil against erosional forces of both wind and water, and provide a naturally sustainable surface cover.

### WATER MANAGEMENT

The closure plan will consider water management issues related to:

- Control and mitigation of drainage issues from surface waste materials
- The long term fate of discharges of process water from the mill, drainage from the mine, sanitary sewage, and other wastewater from the site infrastructure following closure of the mine
- Control and mitigation of discharge water from the mine tailings disposal area following closure of the mine
- Site drainage and surface run-off for the mine site to control erosion, sedimentation, and the degradation of adjacent water courses.

The overall objective of the water management within the closure plan is to minimize any impact to the water resources on site and surrounding area. Integrated water management, including monitoring of surface and groundwater resources, will be used to ensure that water quality is maintained within guideline levels without creating the requirement for long term water treatment.

### LONG TERM LAND USE

The closure plan must consider long term land use for the mine site that is sustainable and compatible with local and regional topography, soil and climatic conditions.

Other land use options, such as agricultural and commercial/industrial are not considered viable at this time. However, natural vegetation of the site is expected to permit managed forestry activity and recreational activity to resume.

Final closure planning would be based on the current CCME soil quality guidelines to industrial classification.



While RPA has not completed a closure plan for the Project, an allowance of \$18 million has been included in the PEA cash flow. This estimate is based on comparison to similar projects.



# 21 CAPITAL AND OPERATING COSTS

#### **CAPITAL COST ESTIMATES**

#### **SUMMARY**

The mine, mill, and site infrastructure costs are summarized in Table 21-1. All costs in this section are in 2012 Canadian dollars unless otherwise specified.

TABLE 21-1 CAPITAL COST SUMMARY Search Minerals Inc. – Foxtrot Project

Cost Area	Initial (C\$ million)	Sustaining (C\$ million)
Surface Infrastructure	41.0	3.7
Mining	36.7	9.3
Processing	138.4	6.1
Tailings	29.1	10.0
Owners/Indirect Costs	61.3	0.0
Rehabilitation & Mine Closure	0.0	19.0
EPCM	36.8	0.0
Contingency	103.0	0.0
Total	446.3	48.1

For the purpose of the economic analysis, the total capital cost which includes initial and sustaining capital costs is \$494.4 million.

Capital costs were estimated using cost models, unit prices, suppliers' budget quotes, preliminary designs, general industry knowledge and experience, and other information from recent similar Projects. The expected accuracy on cost estimates is ±35%, which is typical of a PEA study.

Engineering, procurement, and construction management (EPCM), and contingency for all capital cost components vary depending on cost area. In order to estimate these components, specific factors were applied. A 15% factor for EPCM and a 30% factor for contingency were applied to initial direct capital costs. The capital cost totals for EPCM and contingency are \$36.8 million and \$103.0 million, respectively.



#### SURFACE INFRASTRUCTURE

Surface infrastructure costs include general site preparation, construction of on-site roads, buildings construction, equipment and furniture, power distribution, fluid pumping networks, fuel storage and distribution, and fire protection. Surface infrastructure capital costs are shown in Table 21-2.

TABLE 21-2 SURFACE INFRASTRUCTURE CAPITAL Search Minerals Inc. – Foxtrot Project

Cost Area	Initial
	(C\$ million)
Public Road Access to St-Lewis	0.8
St-Lewis Harbor upgrading	1.0
St-Lewis Airport upgrading	2.5
Site Preparation (Civil Work)	2.5
Pumping Stations	2.5
Administration and Services Office	5.0
Garage, Shops, Warehouse and Cold Shed	6.0
Accommodation Camp	13.0
Concrete Plant	1.5
Mobile Equipment	0.7
Site preparation Explosive Magazine	0.2
Diesel tank and distribution	1.5
Genset and Electrical Distribution	3.8
Total	41.0

Sustaining capital for surface infrastructure was estimated at \$410,000 annually, which totals to \$3.7 million over the LOM.

#### MINING

Mining capital costs include mining equipment fleet purchases, open pit site preparation, waste pile and ore stockpile preparation, ditches and hauling roads from open pit to ROM pad and waste dump and other related installations.

Equipment is the most expensive cost item of the mine capital. Mine fleet was estimated based on open pit operations of a similar scale. The truck, shovel, loader and drill requirements alone were estimated using mineralized material and waste cycle times,



the shovel's truck service times, and drill penetration rate and productivities. Most equipment costs were obtained from suppliers on the basis of budget quotes.

Mining capital costs are summarized in Table 21-3.

TABLE 21-3 MINING CAPITAL COST Search Minerals Inc. – Foxtrot Project

Cost Area	Initial
	(C\$ million)
Equipment	31.5
Open pit site preparation and ditches	1.2
Waste pile site preparation and ditches	2.5
Ore stockpile preparation and ditches	0.3
Hauling roads and ditches	1.2
Total	36.7

The sustaining capital for mining is estimated to be \$9.3 million over the LOM. This includes \$53,000 annually for open pit mine site preparation, and \$2.2 million every two years to cover the replacement of the mining fleet during LOM.

#### PROCESSING FACILITY

The overall processing facilities as shown in the process flowsheet (Section 17, Figure 17-1) are estimated at \$138.4 million, utilizing similar factored plant costs. This estimate includes equipment, materials, electrical, and construction.

TABLE 21-4 PROCESSING FACILITY CAPITAL COST Search Minerals Inc. – Foxtrot Project

Cost Area	Initial		
	(C\$ million)		
Total	138.4		

Overall plant sustaining capital is estimated at \$6.1 million dollars over the LOM.

#### TAILINGS STORAGE FACILITY

The TSF capital cost is estimated at \$29.1 million as seen in Table 21-5 and is based on facilities with similar storage requirement.



# TABLE 21-5 TAILINGS STORAGE FACILITY CAPITAL COST Search Minerals Inc. – Foxtrot Project

Cost Area	Initial
	(C\$ million)
Total	29.1

Sustaining capital for the TSF totals \$10.0 million over the LOM and includes \$4.0 million in year three and year six and \$2 million in year nine.

#### OWNER'S AND INDIRECT COSTS

Indirect costs consist of warehouse inventory (spare parts) and mill start-up/commissioning. Owner's costs are operating costs that occur during the pre-production period. The costs generally comprise general and administrative and labour expenses.

In order to estimate Indirect and Owners' capital costs, a factor of 40% was applied to initial direct capital, similar to how EPCM and contingency estimates were derived. From RPA's experience this factor represents a consistent proportion of indirect capital costs to direct capital costs for operating projects. Applying this factor, indirect and owner's costs are estimated to be \$61.3 million.

#### **CLOSURE AND RECLAMATION**

A cost allowance of \$19 million was made for closure and reclamation of the tailings storage facility and mine site. It was assumed that equipment sales would pay for buildings demolition.

#### **EXCLUSIONS**

The following is excluded from the capital costs estimate:

- Project financing and interest charges
- Escalation during the Project
- Permits, fees and process royalties
- Pre-feasibility and Feasibility studies
- Environmental impact studies
- Any additional civil, concrete work due to the adverse soil condition and location
- Taxes
- Import duties and custom fees



- Cost of geotechnical and geomechanical investigations
- Cost of hydrogeology investigations
- · Rock mechanics study
- Metallurgical testwork
- Exploration drilling
- Costs of fluctuations in currency exchanges
- Project application and approval expenses.

#### **OPERATING COST ESTIMATES**

#### SUMMARY

Mine life average operating unit costs for the Project are shown in Table 21-6. Details on individual operating costs will be provided in the following sections.

TABLE 21-6 UNIT OPERATING COSTS SUMMARY Search Minerals Inc. – Foxtrot Project

Cost area	<b>LOM Unit Cost</b>	<b>LOM Unit Cost</b>
	(C\$/t milled)	(C\$/t moved)
Mining (Owner/Contractor)	35.64	4.24
Processing	52.50	
G&A	8.12	
Total operating cost	96.26	

#### MINING

Mine operating costs were estimated using cost models, unit prices, suppliers' budget quotes, general knowledge and experience, preliminary designs, and other information from recent similar projects. The expected accuracy on cost estimates is of PEA study level (±35%).

The owner unit mining cost was estimated to be \$3.95/t moved including an extra cost of \$0.78/t moved attributed to the fly-in/fly-out schedule (\$0.31/t moved) and extra cost of energy power supplied by diesel driven generators (Genset) versus hydroelectric (\$0.47/t moved).

The contractor unit mining cost was estimated to \$5.00/t moved, it is an increase of 44% from owner mining cost attributed to fixed cost for overhead, supervision, security and profit, and room and board for contractor's workers. For the LOM the weighted average mining cost will be \$4.24/t moved.



#### PROCESSING FACILITY

Process operating costs are estimated at \$52.50 per tonne milled and is presented in Table 21-7. The cost is estimated from similar rare earth projects in similar geopolitical jurisdictions and includes consideration for diesel power generation, maintenance, reagents and other consumables.

TABLE 21-7 BREAKDOWN OF MILL OPERATING COST Search Minerals Inc. – Foxtrot Project

Cost area	Unit Cost
	(C\$/t milled)
Total processing cost	52.50

#### **GENERAL AND ADMINISTRATION**

G&A comprise the cost of administration services and staff, as well as management, human resources for engineering, geology, environment, and construction. The remaining costs are for material and supplies, some consultants, insurance and taxes, and communications. G&A has been estimated at \$11.6 million per year or \$8.12/t milled (based on 1.44 Mtpa).

#### **MANPOWER**

Manpower estimates are based on typical manpower requirements for open pit operations of similar scale, similar fly-in/fly-out schedule, and in similar geopolitical jurisdictions. Manpower estimates for the various administrative units are shown in Table 21-8.

TABLE 21-8 MANPOWER SUMMARY Search Minerals Inc. – Foxtrot Project

Unit	Operation	Maintenance	Supervision and Services	Total
Administration	-	-	30	30
Mine Owner	82	22	18	122
Mine Contractor	68	-	4	72
Mill and Surface	70	38	12	120
Total	220	60	64	344



# 22 ECONOMIC ANALYSIS

RPA conducted an economic analysis of the Foxtrot Project applying operating and capital costs estimates based on a 10 year production schedule.

The economic analysis shows that, at an average TREO basket price of \$38 per kilogram TREO, the project yields pre-tax net NPV at a 10% discount rate of \$408 million. Total pre-tax undiscounted cash flow is \$1.1 billion.

The total life-of-mine capital is approximately \$494 million, including approximately \$103 million in contingency capital. The average operating cost over the life of the project is approximately \$96.26 per tonne milled.

The Foxtrot Project will process an average of 1,440,000 tonnes annually at an average grade of 0.58% TREE, and produce an average of 6.5 million kilograms of payable rare earth material per year.

Over the life of mine, the pre-tax Internal Rate of Return is 28.5% with a payback period of approximately 2.8 years.

#### **ECONOMIC CRITERIA**

#### **REVENUE**

- 4,000 tonnes per day processing rate
- Average REE recovery of 79%
- Average TREO basket price of \$38 per kg
- LREE Separation charge of \$5 per kg
- HREE separation charge of \$30 per kg
- Revenue is recognized at the time of production.

#### **COSTS**

- Pre-production period: two years
- Mine life: ten years



- Life of Mine production plan as summarized in Table 16-1
- Mine life capital totals \$494 million including contingency
- Average operating cost over the mine life is \$96.26 per tonne milled



#### TABLE 22-1 PRE-TAX CASH FLOW SUMMARY Search Minerals Inc. - Foxtrot Project

	Input	Units	Total/Avg.	2014 -2	2015 -1	2016 1	2017 <b>2</b>	2018 3	2019 4	2020 5	2021 6	2022 7	2023 8	2024 9	2025 10	2026 11	2027 12
Mining Mined Ore by Owner Mined Waste by Owner Mined Waste by Contractor		tonnes tonnes tonnes	14,279,000 73,010,366 32,827,520			1,368,000 2,681,290	1,440,000 8,515,255	1,440,000 8,640,000 5,629,165	1,440,000 8,640,000 9,802,565	1,440,000 8,640,000 9,451,228	1,440,000 8,640,000 7,944,562	1,440,000 9,070,675	1,440,000 7,211,753	1,440,000 6,226,836	1,391,000 4,744,557		
Total Material Moved		tonnes	120,116,886			4,049,290	9,955,255	15,709,165	19,882,565	19,531,228	18,024,562	10,510,675	8,651,753	7,666,836	6,135,557		
Waste to Ore ratio			7.41			1.96	5.91	9.91	12.81	12.56	11.52	6.30	5.01	4.32	3.41		
Processing Ore to Mill		'000 tonnes tpd	14,279	-	-	1,368 3.909	1,440 4,114	1,440 4,114	1,440 4,114	1,440 4,114	1,440 4,114	1,440 4,114	1,440 4,114	1,440 4,114	1,391 3.974		
Head Grade Scandium	1.8	ppm	1.8			1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8		
Yttrium Lanthanum	721.4 1,081.8	ppm ppm	721.4 1,081.8			721.4 1,081.8	721.4 1,081.8	721.4 1,081.8	721.4 1,081.8	721.4 1,081.8	721.4 1,081.8	721.4 1,081.8	721.4 1,081.8	721.4 1,081.8	721.4 1,081.8		
Cerium Praesodymium	2,185.7 250.6	ppm ppm	2,185.7 250.6			2,185.7 250.6	2,185.7 250.6	2,185.7 250.6	2,185.7 250.6	2,185.7 250.6	2,185.7 250.6	2,185.7 250.6	2,185.7 250.6	2,185.7 250.6	2,185.7 250.6		
Neodymium Samarium	934.4 168.3	ppm ppm	934.4 168.3			934.4 168.3	934.4 168.3	934.4 168.3	934.4 168.3	934.4 168.3	934.4 168.3	934.4 168.3	934.4 168.3	934.4 168.3	934.4 168.3		
Europium Gadolinium	8.1 135.5	ppm	8.1 135.5			8.1 135.5	8.1 135.5	8.1 135.5	8.1 135.5	8.1 135.5	8.1 135.5	8.1 135.5	8.1 135.5	8.1 135.5	8.1 135.5		
Terbium Dysprosium	22.1 128.4	ppm ppm	22.1 128.4			22.1 128.4	22.1 128.4	22.1 128.4	22.1 128.4	22.1 128.4	22.1 128.4	22.1 128.4	22.1 128.4	22.1 128.4	22.1 128.4		
Holmium Erbium	24.7 70.2	ppm	24.7 70.2			24.7 70.2	24.7 70.2	24.7 70.2	24.7 70.2	24.7 70.2	24.7 70.2	24.7 70.2	24.7 70.2	24.7 70.2	24.7 70.2		
Thulium Ytterbium	10.2	ppm	10.2			10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2		
Lutetium Zirconium	9.6 7,110.7	ppm ppm	9.6 7,110.7			9.6 7,110.7	9.6 7,110.7	9.6 7,110.7	9.6 7,110.7	9.6 7,110.7	9.6 7,110.7	9.6 7,110.7	9.6 7,110.7	9.6 7,110.7	9.6 7,110.7		
Niobium Uranium	471.0 20.4	ppm	471.0 20.4			471.0 20.4	471.0 20.4	471.0 20.4	471.0 20.4	471.0 20.4	471.0 20.4	471.0 20.4	471.0 20.4	471.0 20.4	471.0 20.4		
LREE Grade	20.4	ppm ppm	4,620.8			4,620.8	4,620.8	4,620.8	4,620.8	4,620.8	4,620.8	4,620.8	4,620.8	4,620.8	4,620.8		
HREE Grade Total REE Grade		ppm ppm	1,194.4 5,815.2			1,194.4 5,815.2	1,194.4 5,815.2	1,194.4 5,815.2	1,194.4 5,815.2	1,194.4 5,815.2	1,194.4 5,815.2	1,194.4 5,815.2	1,194.4 5,815.2	1,194.4 5,815.2	1,194.4 5,815.2		
Average Recovery			13,419.1			13,419.1	13,419.1	13,419.1	13,419.1	13,419.1	13,419.1	13,419.1	13,419.1	13,419.1	13,419.1		
Scandium Yttrium	no info 79.5%	% %	0.0% 79.5%			no info 79.5%	no info 79.5%	no info 79.5%	no info 79.5%	no info 79.5%	no info 79.5%	no info 79.5%	no info 79.5%	no info 79.5%	no info 79.5%		
Lanthanum	81.9%	96	81.9%			81.9%	81.9%	81.9%	81.9%	81.9%	81.9%	81.9%	81.9%	81.9%	81.9%		
Cerium Praesodymium	78.9% 82.3%	% %	78.9% 82.3%			78.9% 82.3%	78.9% 82.3%	78.9% 82.3%	78.9% 82.3%	78.9% 82.3%	78.9% 82.3%	78.9% 82.3%	78.9% 82.3%	78.9% 82.3%	78.9% 82.3%		
Neodymium Samarium	77.7% 80.1%	% %	77.7% 80.1%			77.7% 80.1%	77.7% 80.1%	77.7% 80.1%	77.7% 80.1%	77.7% 80.1%	77.7% 80.1%	77.7% 80.1%	77.7% 80.1%	77.7% 80.1%	77.7% 80.1%		
Europium Gadolinium	79.5% 78.6%	% %	79.5% 78.6%			79.5% 78.6%	79.5% 78.6%	79.5% 78.6%	79.5% 78.6%	79.5% 78.6%	79.5% 78.6%	79.5% 78.6%	79.5% 78.6%	79.5% 78.6%	79.5% 78.6%		
Terbium Dysprosium	78.3% 77.3%	% %	78.3% 77.3%			78.3% 77.3%	78.3% 77.3%	78.3% 77.3%	78.3% 77.3%	78.3% 77.3%	78.3% 77.3%	78.3% 77.3%	78.3% 77.3%	78.3% 77.3%	78.3% 77.3%		
Holmium Erbium	77.5% 77.6%	% %	77.5% 77.6%			77.5% 77.6%	77.5% 77.6%	77.5% 77.6%	77.5% 77.6%	77.5% 77.6%	77.5% 77.6%	77.5% 77.6%	77.5% 77.6%	77.5% 77.6%	77.5% 77.6%		
Thulium Ytterbium	77.8% 77.6%	% %	77.8% 77.6%			77.8% 77.6%	77.8% 77.6%	77.8% 77.6%	77.8% 77.6%	77.8% 77.6%	77.8% 77.6%	77.8% 77.6%	77.8% 77.6%	77.8% 77.6%	77.8% 77.6%		
Lutetium Zirconium	77.7%	% %	77.7% 0.0%			77.7%	77.7% 0.0%	77.7%	77.7% 0.0%	77.7% 0.0%	77.7% 0.0%	77.7% 0.0%	77.7%	77.7% 0.0%	77.7% 0.0%		
Niobium Uranium	79.6%	% %	0.0% 79.6%			0.0% 79.6%	0.0% 79.6%	0.0% 79.6%	0.0% 79.6%	0.0% 79.6%	0.0% 79.6%	0.0% 79.6%	0.0% 79.6%	0.0% 79.6%	0.0% 79.6%		
Total REE Average Recovery	75.0%	/*	79.3%			75.076	75.076	75.076	75.0%	75.076	75.076	75.076	75.076	75.076	75.076		
Concentrate Weight Recovery Concentrate Tonnage	38.5%	'000 tonnes	5,495			38.5% 526	38.5% 554	38.5% 554	38.5% 554	38.5% 554	38.5% 554	38.5% 554	38.5% 554	38.5% 554	38.5% 535		
Concentrate Grades			-,														
Scandium Yttrium		ppm ppm	1,491			1,491	1,491	1,491	1,491	1,491	1,491	1,491	1,491	1,491	1,491		
Lanthanum Cerium		ppm	2,302 4,478			2,302 4,478	2,302 4,478	2,302 4,478	2,302 4,478	2,302 4,478	2,302 4,478	2,302 4,478	2,302 4,478	2,302 4,478	2,302 4,478		
Praesodymium Neodymium		ppm ppm	536 1,887			536 1,887	536 1.887	536 1.887	536 1.887	536 1.887	536 1.887	536 1.887	536 1.887	536 1.887	536 1.887		
Samarium Europium		ppm	350 17			350 17	350 17	350 17	350 17	350 17	350 17	350 17	350 17	350 17	350 17		
Gadolinium Terbium		ppm	277 45			277 45	277 45	277 45	277 45	277 45	277 45	277 45	277 45	277 45	277 45		
Dysprosium Holmium		ppm	258 50			258 50	258 50	258 50	258 50	258 50	258 50	258 50	258 50	258 50	258 50		
Erbium Thulium		ppm	142			142 21	142	142 21	142	142	142	142	142	142	142		
Ytterbium		ppm	129			129 19	129	129 19	129 19	129 19	129 19	129 19	129 19	129 19	129		
Lutetium Zirconium		ppm ppm	19			-	19	- 19	- 19	- 19	- 19	- 19	- 19	- 19	19		
Niobium Uranium		ppm ppm	42			42	42	42	42	42	42	42	42	42	42		
Material Recovered Scandium		kg	_			-	-	-	_	_	_	_	-	-	_		
Yttrium Lanthanum		kg kg	8,190,737 12,649,566			784,714 1,211,892	826,015 1,275,676	826,015 1,275,676	826,015 1,275,676	826,015 1,275,676	826,015 1,275,676	826,015 1,275,676	826,015 1,275,676	826,015 1,275,676	797,907 1,232,267		
Cerium Praesodymium		kg	24,608,778 2 943 882			2,357,645 282,039	2,481,731	2,481,731	2,481,731	2,481,731	2,481,731	2,481,731 296,883	2,481,731	2,481,731	2,397,283		
Neodymium		kg kg	10,368,299			993,335	1,045,616	1,045,616	1,045,616	1,045,616	1,045,616	1,045,616	1,045,616	1,045,616	1,010,036		
Samarium Europium Gadolinium		kg kg	1,924,567 91,967 1,520,079			184,383 8,811 145,631	194,088 9,275 153,296	194,088 9,275 153,296	194,088 9,275 153,296	194,088 9,275 153,296	194,088 9,275 153,296	194,088 9,275 153,296	194,088 9,275 153,296	194,088 9,275 153,296	187,483 8,959 148,080		
Terbium		kg kg kg	247,025			23,666	24,912	24,912	24,912	24,912	24,912	24,912	24,912	24,912	24,064		
Dysprosium Holmium		kg	1,417,786 273,406			135,831 26,194	142,980 27,572	142,980 27,572	142,980 27,572	142,980 27,572	142,980 27,572	142,980 27,572	142,980 27,572	142,980 27,572	138,115 26,634		
Erbium Thulium		kg kg	778,002 113,320			74,536 10,857	78,459 11,428	78,459 11,428	78,459 11,428	78,459 11,428	78,459 11,428	78,459 11,428	78,459 11,428	78,459 11,428	75,790 11,039		
Ytterbium Lutetium		kg kg	711,506 106,524			68,166 10,205	71,754 10,743	71,754 10,743	71,754 10,743	71,754 10,743	71,754 10,743	71,754 10,743	71,754 10,743	71,754 10,743	69,312 10,377		
Zirconium Niobium Uranium		kg kg	231,897			22,217	23,386	23,386	23,386	23,386	23,386	23,386	23,386	23,386	22,590		
Total Material Recovered		kg kg	66,177,342			6,340,122	6,673,813	6,673,813	6,673,813	6,673,813	6,673,813	6,673,813	6,673,813	6,673,813	6,446,718		
TREE Con Grade	1	%	1.20%			1.20%	1.20%	1.20%	1.20%	1.20%	1.20%	1.20%	1.20%	1.20%	1.20%		



#### SENSITIVITY ANALYSIS

Project risks can be identified in both economic and non-economic terms. Key economic risks were examined by running cash flow sensitivities on:

- Head Grade;
- · Recovery;
- Rare Earth Oxide Prices;
- Operating Cost Per Tonne Milled, and
- Capital Cost.

The rare earths price sensitivity is based on results using a rare earth oxide base case price forecast, which equates to a \$38/kg net revenue basket price.

The pre-tax NPV (at 10%) sensitivity analysis has been calculated for -20% to +20% variations. The sensitivities are shown in Table 22-2, Figure 22-1 and Figure 22-2. The NPV is most sensitive to rare earth oxide prices, followed by head grade and metallurgical recovery.



# TABLE 22-2 SENSITIVITY ANALYSIS

#### **Search Minerals Inc. – Foxtrot Project**

#### Sensitivity to Head Grade

TREE (%)	NPV @ 10% Million	IRR
0.47	\$103	15%
0.52	\$256	22%
0.58	\$408	28%
0.64	\$561	34%
0.70	\$713	40%

#### Sensitivity to Recovery

REC%	NPV @ 10% Million	IRR
63.4%	\$103	15%
71.4%	\$256	22%
79.3%	\$408	28%
81.3%	\$446	30%
83.3%	\$484	31%

#### **Sensitivity to TREO Basket Price**

TREO C\$/kg	NPV @ 10% Million	IRR	
\$29	\$49	13%	
\$34	\$229	21%	
\$38	\$408	28%	
\$43	\$588	35%	
\$47	\$767	42%	

#### **Sensitivity to Operating Cost Per Tonne Milled**

C\$/t milled	NPV @ 10% Million	IRR
\$77	\$551	34%
\$87	\$479	31%
\$96	\$408	28%
\$106	\$337	26%
\$116	\$265	22%

#### **Sensitivity to Capital Cost**

, ,			
C\$ Millions	NPV @ 10% Million	IRR	
\$395	\$491	36%	
\$445	\$450	32%	
\$494	\$408	28%	
\$544	\$367	25%	
\$593	\$325	23%	





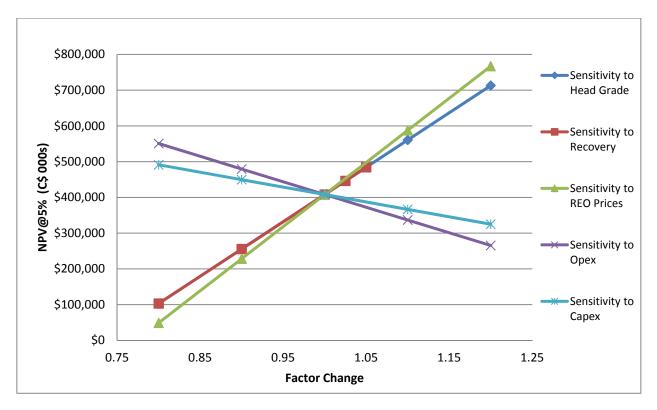
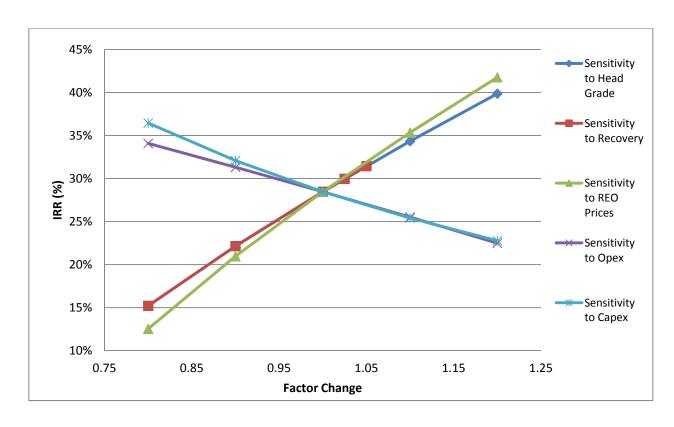


FIGURE 22-2 IRR SENSITIVITY ANALYSIS





#### **CURRENT PRICE SENSITIVITY ANALYSIS**

RPA further conducted a rare earth oxide price sensitivity using a current price forecast (Q2 2012), which equates to a \$99/kg net revenue basket price. The current prices used to analyze the model are presented in Table 22-3.

TABLE 22-3 CURRENT SPOT PRICES Search Minerals Inc. – Foxtrot Project

Rare Earth Oxide	FOB China Q2 2012 Spot* (US\$/kg)
$Ce_2O_3$	25
$La_2O_3$	24
$Nd_2O_3$	175
$Pr_2O_3$	140
$Sm_2O_3$	90
$Eu_2O_3$	2,300
$Gd_2O_3$	100
$Sc_2O_3$	7,200
$Y_2O_3$	132
$Yb_2O_3$	90
$Dy_2O_3$	1,100
$Er_2O_3$	195
$Ho_2O_3$	-
$Lu_2O_3$	-
$Tb_4O_7$	2,000
$Tm_2O_3$	-

<sup>\*</sup> Source: Metal-Pages.com

At current prices, the undiscounted pre-tax cash flow in this case totals \$5.9 billion. The IRR is 100% and the NPV is as follows:

- \$4.0 billion at a 5% discount rate
- \$3.3 billion at a 8% discount rate
- \$2.8 billion at a 10% discount rate



# 23 ADJACENT PROPERTIES

There are currently no adjacent properties looking for rare earth elements.



# 24 OTHER RELEVANT DATA AND INFORMATION

No additional information or explanation is necessary to make this Technical Report understandable and not misleading.



# 25 INTERPRETATION AND CONCLUSIONS

In RPA's opinion, the PEA indicates that positive economic results can be obtained for the Foxtrot Project, in a scenario that includes open pit mining, and rare earth recovery by acid baking/water leaching.

The LOM plan for the Project indicates that 14.3 Mt, at an average grade of 0.58% TREE, will be mined over 10 years at a nominal production rate of 4,000 tpd. REE production is projected to total 66 million kg.

Specific conclusions by area of the PEA are as follows.

#### **GEOLOGY AND RESOURCES**

RPA estimated Mineral Resources on the Foxtrot deposit using drill hole data available from two phases of drilling, as of September 30, 2011. The Mineral Resource estimate uses a cut-off grade of 130 ppm dysprosium. This reporting cut-off grade, which corresponds to 150 ppm for the oxide form, Dy<sub>2</sub>O<sub>3</sub>, produces an NSR value considerably higher than the anticipated cost of mining and processing ore. Even with changes and uncertainties in the metal prices, recoveries and costs, material with more than 130 ppm Dy meets the requirement of the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definition Standards: that Mineral Resources have a reasonable prospect of economic extraction.

Indicated Mineral Resources are estimated to total 3.41 Mt at 0.89% TREE (or 1.07% TREO), and Inferred Mineral Resources are estimated to total 5.85 Mt at 0.80% TREE (or 0.96% TREO).

A third phase exploration program, completed in 2012, aimed at extending the deposit in the Central Zone from 200 m to 400 m in depth (as described in a Search Minerals news release dated February 1, 2012). Phase III drilling was not included in the resource estimate used for the PEA, however, it is included in a resource update currently in progress.



Within the Felsic Zone that hosts the rare-earth mineralization, the mineralization with economic potential is hosted in bands of felsic volcanics that are inter-layered with mafic bands. The first two phases of drilling have confirmed that it is possible to visually identify the felsic mineralization from the mafics. Statistical analysis of the multi-element inductively coupled plasma (ICP) data for the resource estimation studies also suggests that it is possible to identify the felsic material using automated classification based on major-element chemistry. The combination of a characteristic visual appearance and a characteristic multi-element signature creates many possibilities for efficient and effective grade control. There are optical and chemical sorting technologies that should be very effective at segregating the higher-grade material from the mixed volcanics.

Statistical analysis of the assay data from the felsic samples shows that there is a bimodal distribution in the felsic bands. With the higher-grade population having grades approximately five times those of the lower-grade population, it may be possible to further upgrade the run-of-mine material into an even higher-grade product in fewer ore tonnes. To realize this possibility, a better understanding of the geology and mineralogy of the two felsic populations is needed.

The very strong correlations between the REEs will simplify grade control. The entire rare earth suite of elements occurs as a single package at Foxtrot Project, and a future mining operation will not have to contend with the complications of having to mine material that has low grades of some REEs in order to recover higher-grades of other REEs.

#### **MINING**

RPA investigated production rates in the 3,000 tpd to 4,000 tpd range, for both open pit and underground mining methods. Within 200 m of surface, strip ratios remain low enough for open pit methods to produce more favourable results. Underground mining remains worth consideration when Phase III drilling (to more than 400 m depth) is incorporated into the resource estimate.

The PEA production rate is 1,440,000 tpa or 4,000 tpd of REE bearing material. Mining of ore and waste (no pre-stripping of overburden is required, as the deposit is exposed on surface) would be carried out by the owner and by contractor to balance mining equipment requirements over the life of the operation.



The combination of owner-operated and contract mining will be carried out using a conventional open pit method consisting of the following activities:

- Drilling performed by conventional production drills.
- Blasting using ANFO (ammonium-nitrate fuel oil) and a down-hole delay initiation system.
- Loading and hauling operations performed with hydraulic shovel, front-end loader and rigid frame haulage trucks.

Geotechnical and pit design parameters are assumptions based on comparable operations, and require site-specific investigation as the Project advances.

#### PROCESSING AND METALLURGY

Metallurgical testwork involved three beneficiation techniques to concentrate the REE in the Foxtrot sample, including Wilfley tabling, magnetic separation and flotation. The Wilfley tabling was used to test amenability to gravity concentration. Magnetic separation was used to reject magnetite from the Wilfley concentrates. Flotation was tested both as a primary method of concentration for the Foxtrot sample and as a scavenging method to recover additional REE from the Wilfley tails. The work was preliminary in nature.

Recovery of REEs from the combined beneficiation results ranges from 80% to 86%.

The gravity concentrate and the combined gravity/flotation concentrate (Table 13-4) were subjected to hydrometallurgical processing by acid leaching or acid baking at 200 °C to 250 °C followed by water leaching. The acid bake and water leach results produced high extractions.

Overall recoveries range from 79% to 82% for light rare earths, and 73% to 78% for heavy rare earths.

The process proposed for the PEA utilizes the following basic unit operations: crushing, grinding, gravity recovery, magnetic separation, flotation, acid bake, water leaching, and solution purification to recover a mixed REE product.



#### **ENVIRONMENT**

The Project is at an early stage, and Search Minerals has not yet begun environmental baseline work or community consultation. Despite that, RPA does not anticipate any fatal flaws regarding environmental issues with the Project as proposed. The challenges normal to permitting and developing an open pit mine in Labrador are expected to be manageable.

#### **MARKETS**

The market for rare earth products is small and public information on price forecasts and sales terms are difficult to obtain. Current prices are tracked by sources such as Asian Metal and Metal-Pages<sup>TM</sup>, based on transactions.

Recent history shows international rare earth market prices growing at an unprecedented rate since China cut export quotas by approximately 40% in 2011. China's overwhelming control on the rare earth supply chain, from upstream mining to downstream processing and end-user products, is likely to remain intact on all but a few materials through 2016. Rare earth prices are expected to remain volatile in the short term.

Price forecasting in this environment is difficult, and certain to contain wide margins of error.

A small number of REE producers outside of China are likely to be in operation by the time the Foxtrot Project is developed. This is expected to saturate the market for LREO such as lanthanum and cerium, however, demand for high-value HREO (such as dysprosium) is expected to grow, and supply is expected to remain in deficit. Revenue for the Foxtrot Project is dominated by dysprosium, neodymium, and terbium, elements that are projected to remain in supply deficit.

Rare earth prices were selected from the low end of a range of available forecasts, averaging \$38/kg of REO (net of separation charges). Q2 2012 spot prices, for comparison, average \$99/kg REO (net).

RPA considers these rare earths prices to be appropriate for a PEA-level study, however, we note that the recent market volatility introduces considerably more



uncertainty than a comparable base or precious metals project. This uncertainty is mitigated to some extent, by the selection of conservative rare earths pricing.



# **26 RECOMMENDATIONS**

RPA recommends that Search Minerals continue collecting data to support the feasibility and licensing process, and proceed with further engineering studies.

Specific recommendations by area are as follows:

#### **GEOLOGY & MINERAL RESOURCES**

- Additional drilling should continue to test the deep extensions of the resource in the Central Area or should test the shallower lateral extensions of the resource.
   Infill drilling to increase the confidence in the resource estimate will be required before Mineral Reserves can be estimated.
- Update the Mineral Resource estimate with the results of Phase III drilling (this is currently underway).
- Continue efforts to standardize the geological logging. In the current resource estimates, the Felsic Zone has been treated as a single geological domain, and no attempt has been made to identify and model higher-grade sub-domains with this broader zone. From the geological logging of the Phase I and Phase II holes, it is clear that there is a tendency for the better mineralization to lie along the southern edge of the Felsic Zone; in the geological logs, this higher grade sub-domain is often referred to as FT3, with FT2 and FT4 being lower-grade bands on either side. Although it is clear that the southern third of the Felsic Zone is the preferential host of the best mineralization, the logging of FT2, FT3 and FT4 is not spatially consistent in three-dimension (3D).
- If the review and standardization of the logging reveals that there is, indeed, a
  coherent and spatially continuous FT3 band, then future resource studies will be
  able to use this information to more accurately estimate the shape, tonnage and
  grades of this higher-grade core.
- The QA/QC programs used for the Phase I and II drilling have documented that the assay data are reliable for the purposes of resource estimation. With the recommendation for a considerable amount of additional drilling, it is important to continue to make every effort to monitor and control the accuracy and precision of the assay data. Recommended improvements to the existing QA/QC program include: 1) Regular monthly review of the QA/QC data received from the lab, and 2) Submission of standards, blanks and duplicates from the project site so that these quality monitoring samples are blind to the lab.

#### **MINING**

- Update PEA with results of Phase III drilling. Review underground trade-off with open pit mining as part of the update.
- Carry out geotechnical investigation for use in determining pit slopes and underground stope sizing.



#### METALLURGICAL TESTWORK

 The current testwork program at SGS should continue to define recoveries and potential flowsheet.

#### **ENVIRONMENTAL CONSIDERATIONS**

- Begin a program of environmental baseline study work.
- Engage in community and Aboriginal consultation regarding plans for the Project.

A budget for these recommendations has been estimated, as summarized in Table 26-1:

TABLE 26-1 BUDGET FOR PROJECT ADVANCEMENT Search Minerals Inc. – Foxtrot Project

Item	Cost (C\$)
Phase IV Drill Program (10,000 m)	\$1,500,000
Phase V Drill Program (30,000 m)	\$4,500,000
Mineral Resource Update	\$50,000
PEA Update	\$50,000
Metallurgical Testwork	\$100,000
Geotechnical Investigation	\$300,000
Environmental Baseline Studies	\$500,000
Total	\$7,000,000



### **27 REFERENCES**

- Canadian Institute of Mining, Metallurgy and Petroleum (CIM), 2010: CIM Definition Standards for Mineral Resources and Mineral Reserves, Prepared by CIM Standing Committee on Reserve Definitions, Adopted by CIM Council, November 27, 2010
- Dresinger, D. B., Clucas, J.D, Verbaan N., Grammatikopoulos T., Aghamirian, M., Forstner, C. 2012 <u>The Processing of REE's from Search Minerals Foxtrot Resource</u>, COM 2012.
- Gower, C.F., Neuland, S., Newman, M., and Smyth, J. 1987: Geology of the Port Hope-Simpson map region, Grenville Province, eastern Labrador. *In* Current Research. Newfoundland Department of Mines, Mineral Development Division, Report 87-1, pages 183-199.
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- Gower, C.F., 2010: Geology of the St. Lewis River area (NTS sheets 03D/04 and 05; 13A/01, 02, 07 and 08), southeastern Labrador. Geological Survey, Mines Branch, Department of Natural Resources, Government of Newfoundland and Labrador, Map 2010-24, Open File LAB/1566.
- Hanmer, S., Scott, D.J. 1990: Structural observations in the Gilbert River Belt, Grenville Province, southeastern Labrador. *In* Current Research, Part C. Geologic Survey of Canada, Paper 90-1C, pages 1-11.
- Mineral Commodities of Newfoundland & Labrador Rare-Earth Elements (Including Y, Zr, Nb, Be), Geological Survey Mineral Commodities Series No. 6, Geological Survey of Newfoundland & Labrador, Complied by A. Kerr and H. Rafuse, 2011.
- Search Minerals Press Release May 9, 2012 "Search Minerals Announces Successful Metallurgical Testing of Foxtrot Project Sample to Recover a 55.48% TREO +Y2O3 Product (46.99% TREE+Y) with Overall Average Recovery of 78.8%.



# 28 DATE AND SIGNATURE PAGE

This report titled Technical Report on the Foxtrot Project in Labrador, Newfoundland and Labrador, Canada, and dated June 15, 2012 was prepared and signed by the following author:

(Signed & Sealed) "R. Mohan Srivastava"

Dated at Toronto, ON June 15, 2012

R. Mohan Srivastava, P.Geo. Associate Principal Geologist

(Signed & Sealed) "Jacques Gauthier"

Dated at Quebec, QC June 15, 2012

Jacques Gauthier, ing., MGP Principal Mining Engineer

(Signed & Sealed) "Jason J. Cox"

Dated at Toronto, ON June 15, 2012

Jason J. Cox, P.Eng. Principal Mining Engineer

(Signed & Sealed) "Holger Krutzelmann"

Dated at Toronto, ON June 15, 2012

Holger Krutzelmann, P.Eng. Principal Metallurgical Engineer



# 29 CERTIFICATE OF QUALIFIED PERSON

#### JASON J. COX

I, Jason J. Cox, P.Eng., as an author of this report entitled "Technical Report on the Foxtrot Project in Labrador, Newfoundland and Labrador, Canada" prepared for Search Minerals Inc. and dated June 15, 2012 do hereby certify that:

- 1. I am a Senior Mining Engineer with Roscoe Postle Associates Inc. of Suite 501, 55 University Ave Toronto, ON, M5J 2H7.
- 2. I am a graduate of the Queen's University, Kingston, Ontario, Canada, in 1996 with a Bachelor of Science degree in Mining Engineering.
- 3. I am registered as a Professional Engineer in the Province of Ontario (Reg.# 90487158). I have worked as a Mining Engineer for a total of 15 years since my graduation. My relevant experience for the purpose of the Technical Report is:
  - Review and report as a consultant on more than a dozen mining operations and projects around the world for due diligence and regulatory requirements
  - Feasibility Study project work on three North American mines
  - Planning Engineer to Senior Mine Engineer at three North American mines
  - Contract Co-ordinator for underground construction at an American mine
- 4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
- 5. I did not visit the Foxtrot Project.
- 6. I am responsible for the overall preparation of the Technical Report and for the preparation of Sections 1 through 6, 15, 19, 20, and 22 through 29 of the Technical Report.
- 7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101
- 8. I have had no prior involvement with the property that is the subject of the Technical Report.
- 9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.



10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 15<sup>th</sup> day of June, 2012

(Signed & Sealed) "Jason J. Cox"

Jason J. Cox, P.Eng.



#### R. MOHAN SRIVASTAVA

- I, R. Mohan Srivastava, P.Geo., as an author of this report entitled "Technical Report on the Foxtrot Project in Labrador, Newfoundland and Labrador, Canada" prepared for Search Minerals Inc. and dated June 15, 2012 do hereby certify that:
- 1. I am a consulting associate geologist with Roscoe Postle Associates Inc. of Suite 501, 55 University Ave Toronto, ON, M5J 2H7, and President of Benchmark Six Inc.
- 2. I am a graduate of the Massachusetts Institute of Technology (Cambridge, MA, USA) in 1979 with a B.Sc. in Earth Sciences and of Stanford University (Stanford, CA, USA) in 1987 with a M.Sc. in Applied Earth Sciences (Geostatistics).
- 3. I am registered as a Professional Geologist in the Province of Ontario (Reg.#0547). I have worked as a resource estimation geologist and geostatistician for a total of 30 years since my graduation. My relevant experience for the purpose of the Technical Report is:
  - Resource estimation for base and precious metals projects
  - Resource estimation for poly-metallic deposits
  - Exploration and development drilling programs for volcanic-hosted mineral deposits
- 4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
- 5. I have not visited the Foxtrot Project site.
- 6. I am responsible for the preparation of Sections 7 through 12, and 14 and parts of Sections 1, 25, and 26 of the Technical Report.
- 7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.
- 8. I have had no prior involvement with the property that is the subject of the Technical Report.
- 9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.
- 10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

Dated 15<sup>th</sup> day of June, 2012

(Signed & Sealed) "R. Mohan Srivastava"

R. Mohan Srivastava, P.Geo.



#### JACQUES GAUTHIER

- I, Jacques Gauthier, ing., MGP, as an author of this report entitled "Technical Report on the Foxtrot Project in Labrador, Newfoundland and Labrador, Canada" prepared for Search Minerals Inc. and dated June 15, 2012 do hereby certify that:
- 1. I am Principal Mining Engineer with Roscoe Postle Associates Inc. of Suite 302, 1305 Boulevard Lebourgneuf, Québec, QC G2K 2E4.
- 2. I am a graduate of Université Laval, Québec, Quebec, in 1980 with a B.Sc. degree in Mining Engineering and Université du Québec en Abitibi-Témiscamingue, Québec, in 2002 with a Masters of Project Management Professional Profile degree.
- 3. I am registered as a professional engineer in the Province of Ontario (Reg.#100110996) and an engineer in the Province of Quebec (Reg.#34899). I have worked as a mining engineer for a total of 31 years since my graduation. My relevant experience for the purpose of the Technical Report is:
  - Review and report as a consultant on mining operations and projects for due diligence and regulatory requirements
  - Project management of technical and economic feasibility studies
  - Mine planning and technical assistance
  - Practical experience in mining industry as Chief Engineer and Project Manager
- 4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
- 5. I visited the Foxtrot Project on October 27, 2011.
- 6. I am responsible for the preparation of Sections 16, 18, and 21 and parts of Sections 1, 25, and 26 of the Technical Report.
- 7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.
- 8. I have had no prior involvement with the property that is the subject of the Technical Report.
- 9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.
- 10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated 15<sup>th</sup> day of June, 2012

(Signed & Sealed) "Jacques Gauthier"

Jacques Gauthier, ing., MGP



#### HOLGER KRUTZELMANN

I, Holger Krutzelmann, P. Eng., as an author of this report entitled "Technical Report on the Foxtrot Project in Labrador, Newfoundland and Labrador, Canada" prepared for Search Minerals Inc. and dated June 15, 2012 do hereby certify that:

- 1. I am Vice President, Metallurgy & Environment with Roscoe Postle Associates Inc. of Suite 501, 55 University Ave Toronto, ON, M5J 2H7.
- 2. I am a graduate of Queen's University, Kingston, Ontario, Canada in 1978 with a B.Sc. degree in Mining Engineering (Mineral Processing).
- 3. I am registered as a Professional Engineer with Professional Engineers Ontario (Reg.# 90455304). I have worked in the mineral processing field, in operating, metallurgical, managerial; and engineering functions, for a total of 33 years since my graduation. My relevant experience for the purpose of the Technical Report is:
  - Reviews and reports as a metallurgical consultant on a number of mining operations and projects for due diligence and financial monitoring requirements
  - Senior Metallurgist/Project Manager on numerous gold and base metal studies for a leading Canadian engineering company.
  - Management and operational experience at several Canadian and U.S. milling operations treating various metals, including copper, zinc, gold and silver.
- 4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
- 5. I did not visit the Foxtrot Project.
- 6. I am responsible for the preparation of Sections 13 and 17, and parts of Sections 1, 25, and 26 of the Technical Report.
- 7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.
- 8. I have had no prior involvement with the property that is the subject of the Technical Report.
- 9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.



10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 15<sup>th</sup> day of June, 2012

(Signed & Sealed) "Holger Krutzelmann"

Holger Krutzelmann, P.Eng.