APPENDIX L

AVALON HAZARDOUS MATERIALS SPILL CONTINGENCY PLAN

Appendix L.1 Hazardous Materials Spill Contingency Plan – Response Procedures for Site Personnel. Avalon Rare Metals Inc. Thor Lake Project, April 2011

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Hazardous Materials Spill Contingency Plan
Response Procedures for Site Personnel

Thor Lake Project

April 2011

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1.0 INTRODUCTION

1.1 Plan Purpose

The purpose of the Spill Contingency Plan is to provide a strategic action plan for hazardous materials spills that may occur at the Thor Lake Project (TLP) site. The plan clearly defines the responsibilities of key personnel and outlines procedures to effectively and efficiently contain and recover hazardous materials spills. The plan is a working document which will be kept current by the EHS Coordinator during the projects construction and operations phases.

Petroleum products, reagents and hazardous materials considered in the TLP Spill Contingency Plan include but are not limited to:

PETROLEUM PRODUCTS, REAGENTS AND HAZARDOUS MATERIALS			
Products	Supplied As		Properties & Characteristics
	Conc. %	Form	
Diesel Fuel	100	Liquid	See MSDS in Appendix
Hydraulic Oil	100	Liquid	See MSDS in Appendix
Motor Oil	100	Liquid	See MSDS in Appendix
Gasoline	100	Liquid	See MSDS in Appendix
Antifreeze	100	Liquid	See MSDS in Appendix
Propane	100	Liquid	See MSDS in Appendix
ANFO	100	Liquid	See MSDS in Appendix
Greywater Sewage	100	Liquid	See MSDS in Appendix
Ferric Chloride ($FeCl_3$)	98	Solid	See MSDS in Appendix
Fluorosilicic Acid (H_2SiF_6)	24	Liquid	See MSDS in Appendix
Flocculant (Magnafloc 156)	100	Solid	See MSDS in Appendix
Sodium Hexametaphosphate $(NaPO_3)_6$	98	Solid	See MSDS in Appendix
Sodium Hydroxide (NaOH)	99	Solid	See MSDS in Appendix
Sodium Silicate (Na_2SiO_3)	100	Solid	See MSDS in Appendix
Sodium Sulphide (Na_2S)	60	Solid	See MSDS in Appendix
Flotinor SM15 (1682)	100	Liquid	See MSDS in Appendix
Aero 845	100	Liquid	See MSDS in Appendix
Disponil SLS 101/103	30	Liquid	See MSDS in Appendix
Witcomul 3251	100	Liquid	See MSDS in Appendix
Acumer 9400	43	Liquid	See MSDS in Appendix
Rheosperse 3010	100	Liquid	See MSDS in Appendix
Alginic Acid ($C_6H_8O_6$)	22	Solid	See MSDS in Appendix
Oxalic Acid ($C_2O_2(OH)_2$)	99	Solid	See MSDS in Appendix
Citric Acid ($C_6H_8O_7$)	100	Solid	See MSDS in Appendix
Lactic Acid ($C_3H_6O_3$)	88	Liquid	See MSDS in Appendix

Limestone	95	Solid	See MSDS in Appendix
Lime	100	Liquid	See MSDS in Appendix
Elemental Sulphur (Used on site to produce acid and SO_2)	100	Solid	See MSDS in Appendix
H_2SO_4 (produced on site from sulphur)	100	Liquid	See MSDS in Appendix

1.2 Avalon Rare Metals Inc. Environmental & Safety Policy

Avalon Rare Metals Inc. (the 'Corporation') recognises that maintenance of environmental quality is vital to the Corporation's existence, progress, and continued development. The Corporation will maintain high environmental standards limited only by technical and economic feasibility. The Corporation will take positive action to protect the safety of its workers, conserve natural resources, and minimize the impact of its activities on the environment through diligent application of appropriate technology and responsible conduct at all stages of exploration, mine development, mining, mineral processing, decommissioning, and reclamation.

The purpose of Avalon Rare Metals Inc.'s Safety and Environmental Policy is to provide a measurable framework for the performance of the Corporation's activities in an environmentally responsible manner, ensuring compliance by the Corporation and its employees with all applicable environmental regulations and commitments.

Avalon Rare Metals Inc. will:

- Obey the law and conduct all business in an ethical manner;
- Evaluate, plan, construct, and operate all projects and facilities to reduce adverse environmental impacts and to meet or exceed applicable environmental laws, regulations, and standards. In the absence of applicable regulations, the Corporation will apply cost effective best management practices to protect the environment. Require managers of all projects and operations to adhere to the Corporation Environmental Policy and to identify, evaluate, and minimize risks to the environment;
- Continuously review environmental achievements and technology to seek and implement methods for further improvement;
- Require all operations to have site specific emergency response plans which meet or exceed all applicable regulations;
- Conduct regular environmental, health and safety preparedness and emergency response plans to verify compliance with the Corporation's policy and applicable regulations; Identify revisions or improvements to current practices in order to minimize environmental impacts. Report findings regularly to the Board of Directors;
- Educate employees in environmental matters and responsibilities relating to performance of their assigned tasks;

- Foster communication with shareholders, the public, employees, indigenous people and government to enhance understanding of environmental issues affecting the Corporation's activities;
- Work pro-actively with government and the public to define environmental priorities. Participate in the development of responsible laws for the protection of the environment; and
- Allocate sufficient resources to meet the Corporation's environmental goals. Annually assess the projected costs of decommissioning and reclamation of appropriate amount to ensure that there will be sufficient cash reserves to pay for these costs upon closure.

Avalon's health and safety policies were approved and adopted by the Board of Directors on the 18th day of July, 2006.

2.0 SITE DESCRIPTION

2.1 General Site Description

Avalon Rare Metals Inc. ('Avalon') is a publicly traded company engaged in the exploration and development of rare metal deposits in Canada. Avalon's 100% owned Thor Lake Property is located at Thor Lake in the Mackenzie Mining District of the Northwest Territories, about 5 km north of the Hearne Channel of Great Slave Lake and approximately 100 km southeast of the city of Yellowknife. Avalon proposes to mine, mill and produce rare earth carbonate and oxides, zirconium, niobium and tantalum oxides from the Nechalacho deposit, located on its Thor Lake Property. The proposed project is referred to as the Thor Lake Project (TLP).

Approximately 12-14 million tonnes of resources will be mined from the Nechalacho deposit over a period of approximately 20 years of operations. Construction will begin 16-18 months prior to operations, and reclamation activities will commence following cessation of all operations and continue for a period of approximately three years. The proposed TLP has two site components: an underground mine and flotation plant (Nechalacho Mine and Flotation Plant site), to be located at the Thor Lake Property, and a hydrometallurgical plant (Hydrometallurgical Plant site) to be located at the existing brownfields site of the former Pine Point Mine, 85 km east of Hay River, NT on the south shore of Great Slave Lake.

Rare earth elements (REEs) will be mined underground and concentrated at the Nechalacho Mine and Flotation Plant site. The resulting REE concentrates will be barged across the east end of Great Slave Lake to the Hydrometallurgical Plant site. Upon arrival, the concentrate will be transported from the south shore of Great Slave Lake to the Hydrometallurgical Plant site via a haul road. The concentrate will be further processed at the Hydrometallurgical Plant. The resulting final products will be hauled to the Hay River railhead via truck, and direct shipped for further separation.

Nechalacho Mine and Flotation Plant

The Nechalacho Deposit will be mined underground. A decline ramp (15% ramp grade) will be utilized to access the ore zone located at approximately 200 m depth. Production is planned for 2000 tpd during the life of the Project. Mining will be conducted with a first pass of primary stopes, followed by pillar extraction after the primary stopes have been filled. Rubber-tired mechanized equipment will be utilized to provide maximum flexibility. Primary crushing will be completed underground and crushed ore and waste rock will be conveyed to the surface.

Flotation Plant: The process to produce the REE concentrate will involve conventional grinding, crushing and flotation techniques. Processing facilities will include a Flotation Plant that will produce a high grade concentrate that will be barged off-site to the proposed Hydrometallurgical Plant site for secondary processing.

Water Supply: The proposed fresh and process water supply source is Thor Lake. Tailings Management Facility: The tailings management facility will be located up slope from the Flotation Plant and northeast of Thor Lake in the local catchment of Ring and Buck lakes. The tailings will be discharged to a number of locations around the tailings management facility to develop a relatively flat tailings beach and centralized supernatant pond to maximize tailings storage efficiency. Construction of the tailings management facility will occur in two phases over a period of three years.

Camp: A 150 person camp to house the employees and staff will be constructed adjacent to the Flotation Plant and in close proximity to the airstrip.

Power Supply: All site power is currently planned to be generated by a diesel powered generation facility at the site. The power requirements will range from 7.4 MW to 8.4 MW for the 2000 tpd operation. Standby diesel generators will be installed as a secondary power source. Wind, Biomass and geothermal power are also being investigated as supplementary power sources for the Thor Lake Mine and Flotation Plant site however, these initiatives will not be included in the Project development for the current Environmental Assessment. Should these clean energy initiatives prove advantageous for the future Project, Avalon anticipates a separate permitting process for any clean technology initiatives.

Concentrate Storage and Loading: Approximately 360 tonnes per day (tpd) of concentrate will be produced from the Flotation Plant for the anticipated duration of production. The concentrate will be loaded directly from the Flotation Plant into half-height intermodal containers. Once loaded, the containers will be removed from the Flotation Plant and transported to the seasonal barge loading area either for shipment to the Hydrometallurgical Plant or for winter storage in a designated stacking area to be located near the barging facility.

Access Road: The existing 5 km access road that extends from the proposed Nechalacho Mine and Flotation Plant site to the current barge landing site will be upgraded for the safe transport of concentrate and supplies.

Airstrip: The current 300 metre airstrip is located northwest of the proposed Flotation Plant and west of Thor Lake. The airstrip will be upgraded and extended 700 m to a total length of approximately 1000 m. The upgraded airstrip will accommodate Dash 8 and Buffalo aircraft and facilitate the safe transport of employees and supplies.

Fuel Storage: Diesel fuel will be transported from the south side of Great Slave Lake to the barge dock at the Nechalacho Mine and Flotation Plant site. Upon arrival, fuel will be offloaded to an upland receiving fuel storage facility to be located adjacent to the dock at Great Slave Lake. It will then be transferred by tanker truck to the main storage facility to be located west of the Flotation Plant near the diesel power plant.

Dock Facility: A seasonal dock facility comprised of a single barge connected to shore for the open water period and an adjacent yard will be used for concentrate storage and shipment to the Hydrometallurgical Plant site. It will also be used to receive and handle the annual resupply of major Mine consumables including fuel.

Hydrometallurgical Plant

The proposed Hydrometallurgical Plant will further process the REE concentrates from the Nechalacho Mine and Flotation Plant. The process will include acid baking, water washing, filtration, solvent extraction and product drying facilities to produce direct ship products.

Water Supply: Potable and process water will be obtained from an existing nearby open pit lake and treated on-site as necessary for its intended uses.

Hydrometallurgical Tailings Facility: The proposed hydrometallurgical tailings facility (HTF) will be located within an historic open pit (L-37 pit) located south-southwest of the proposed Hydrometallurgical Plant location, near the historic town of Pine Point. The proposed site is located approximately 85 km east of Hay River and 5 km north of the former town of Pine Point. Excess supernatant water from the HTF will be pumped to another historic open pit (N-42 pit), located to the southwest, for discharge and infiltration into the Presqu'ile aquifer. Any water decanted from the hydrometallurgical tailings facility will be discharged in compliance with MVLWB Water License discharge criteria.

Concentrate Storage and Loading: Upon arrival at the Hydrometallurgical Plant, the concentrate storage containers will be unloaded from the trucks and placed into a secure storage area. As required, the containers will be moved into a heated thaw shed. Once in

the thaw shed, the concentrate will be removed from the containers. The containers will be cleaned prior to shipment back to the Nechalacho Mine.

Power Supply: Average power consumption for the Hydrometallurgical Plant during start-up and steady state operations is expected to be between 3.5 to 4.0 MW. This power will be provided through the existing Northwest Territories Power Corporation (NTPC) power grid and substation located at the former Pine Point Mine site. Secondary and backup supply of power will be provided by diesel powered generating units on-site. Wind and geothermal power are also being investigated as supplementary power sources for the Hydrometallurgical Plant site however, are not included in the Projects permitting process at this time.

Limestone Storage: The limestone used to neutralize the Hydrometallurgical Plant's waste stream prior to discharge to the tailings management facility will be obtained from local supply sources and stockpiled in a designated area that is in close proximity to the Hydrometallurgical Plant. Because the limestone is a neutralizing product, no special stockpile considerations will be necessary.

Haul Road: An existing access road remaining from historical mine activities will be upgraded to safely transport the concentrate offloaded from barges on the south shore of Great Slave Lake to the Hydrometallurgical Plant located at the former Pine Point Mine site. The haul road will be approximately 8.6 km long. It will be aligned directly north-south along an existing drainage ditch for approximately 4.9 km prior to connecting to an existing haul road from a former mine pit located north of the main hydrometallurgical plant site area.

Dock Facility: A seasonal dock facility consisting of two barges connected together to create a temporary floating dock and a marshalling yard will be installed on the south shore of Great Slave Lake approximately 8.6 km from the Hydrometallurgical Plant. The seasonal dock facility will permit the berthing and offloading of Thor Lake REE concentrates onto flatbed trucks for transportation to the Hydrometallurgical Plant. This facility will also be used for the annual shipment of major mining consumables, including fuel, to the Nechalacho Mine site.

Product Transportation to Railhead: The Hydrometallurgical Plant will produce approximately 418 tpd of moist concentrate and light rare earth products. The moist acid baked residue makes up 330 tpd while the moist light rare earth filter cake is 88 tpd. Both concentrate and light rare earth products will be blow dried during filtration to minimize moisture content and prepare the products for shipment to Avalon's separation plant. The final products will be packaged and hauled 85 km from the Hydrometallurgical Plant to the Hay River railhead. The final products will be direct-shipped from the railhead to further downstream separation.

The following pages show the site layout for the Nechalacho Mine and Flotation Plant and the Hydrometallurgical Plant.

Infrastructure Footprint

Nechalacho Mine Site

The primary effects of the Nechalacho Mine Site on surficial geology (terrain) and soils will be largely associated with infrastructure development. During the construction phase in particular, soils and terrain will be disturbed as areas are prepared to support infrastructure. The total amount of direct disturbance anticipated at the Nechalacho Mine Site is approximately 164 ha, of which the majority (109 ha or 66%) is attributable to the Tailings Management Facility (TMF).

NECHALACHO MINE SITE FOOTPRINT

Footprint Component	Area (ha)	Proportion of Footprint (%)
Tailings Management Facility	109.1	66.4
Roads	21.0	12.8
Flotation Plant and Miscellaneous Infrastructure	17.5	10.7
Polishing Pond	12.5	7.6
Airstrip	2.7	1.7
Pipelines and Pumps	0.8	0.5
Seasonal Dock Facility	0.7	0.4
Total	**164.4**	**100.0**

Hydrometallurgical Plant Site

At the Hydrometallurgical Plant Site, the footprint covers approximately 62 ha and is situated almost completely (i.e., 92%) on previously disturbed ground. This was an important consideration in the sighting of the Hydrometallurgical Plant and associated infrastructure as this strategy will ensure that no residual effects to terrain and soils will occur in this area.

HYDROMETALLURGICAL PLANT SITE FOOTPRINT

Footprint Component	Area (ha)	Proportion of Footprint (%)
Roads	32.4	51.9
L37 Pit	23.4	37.6
Hydrometallurgical Plant	5.0	8.1
Seasonal Dock Facility	1.5	2.5
Total	**62.3**	**100**