Report to:

AVALON RARE METALS INC.

Thor Lake – Lake Zone Mineral Resource Update

Document No. 0851530201-REP-R0002-01

Report to:

AVALON RARE METALS INC.

THOR LAKE – LAKE ZONE MINERAL RESOURCE UPDATE

MARCH 2009

Prepared by	*"Original document, revision 01, signed by Joanne Paul, P.Geo."* Joanne Paul, P.Geo.	Date	March 30, 2009
Prepared by:	*"Original document, revision 01, signed by Thomas C. Stubens, P.Eng."* Thomas C. Stubens, P.Eng.	Date	March 30, 2009
Reviewed by	*"Original document, revision 01, signed by Gilles Arseneau, P.Geol."* Gilles Arseneau, P.Geol.	Date	March 30, 2009
Authorized by	*"Original document, revision 01, signed by Tim Maunula, P.Geo.* Tim Maunula, P.Geo.	Date	March 30, 2009

WARDROP

330 Bay Street, Suite 900, Toronto, Ontario M5H 2S8
Phone: 416-368-9080 Fax: 416-368-1963

0851530201-REP-R0002-01

REVISION HISTORY

REV. NO	ISSUE DATE	PREPARED BY AND DATE	REVIEWED BY AND DATE	APPROVED BY AND DATE	DESCRIPTION OF REVISION
00	2009/03/20	J. Paul/T. Stubens 2009/03/20	G. Arseneau 2009/03/20	T. Maunula 2009/03/20	First Draft to Client
01	2009/03/30	J. Paul/T. Stubens 2009/03/30	G. Arseneau 2009/03/30	T. Maunula 2009/03/30	Final Report

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

GLOSSARY

UNITS OF MEASURE

Above sea level	asl
Annum (year)	a
Centimetre	cm
Cubic centimetre	cm^3
Cubic foot	ft^3
Cubic inch	in^3
Cubic metre	m^3
Cubic yard	yd^3
Degree	°
Degrees Celsius	°C
Dollar (American)	US$
Dollar (Canadian)	Cdn$
Foot	ft
Gallon	gal
Gram	g
Grams per tonne	g/t
Hectare (10,000 m^2)	ha
Kilo (thousand)	k
Kilogram	kg
Kilometre	km
Kilotonne	kt
Metre	m
Millimetre	mm
Million	M
Million tonnes	Mt
Parts per million	ppm
Parts per billion	ppb
Specific gravity	SG
Square centimetre	cm^2
Square foot	ft^2
Square kilometre	km^2
Square metre	m^2
Thousand tonnes	kt
Tonne (1,000 kg)	t
Tonnes per cubic metre	t/m^3
Tonnes per day	t/d
Tonnes per hour	t/h
Tonnes per year	t/a
Year (annum)	a

MINERALS/ELEMENTS

Antimony	Sb
Arsenic	As
Beryllium	Be
Bismuth	Bi
Calcium Oxide	CaO
Cobalt	Co
Copper	Cu
Gallium	Ga
Hafnium	Hf
Lead	Pb
Molybdenum	Mo
Nickel	Ni
Niobium	Nb
Rare Earth Elements	REE
Silver	Ag
Tantalum	Ta
Thorium	Th
Tin	Sn
Tungsten	W
Uranium	U
Yttrium	Y
Zinc	Zn
Zirconium	Zr

1.0 SUMMARY

Avalon Rare Metals Inc. ("Avalon", formerly Avalon Ventures Ltd.) is a mineral exploration company that has focused on the specialty and rare metals mineral sector over the last 10 years. In that period, the company has recognized growing markets for these metals in response to advancing technologies, and in 2005 acquired title to the Thor Lake deposits, Northwest Territories (NWT), which contains yttrium, rare earth elements, beryllium, tantalum, niobium and zirconium. In 2008, Avalon contracted Wardrop Engineering Inc. (Wardrop) to remodel the Lake Zone deposit, one of two deposits on the Thor Lake Property previously modelled by Wardrop in 2007. The new Lake Zone model and Mineral Resource Estimate includes the recently discovered Basal Zone, as well as the Upper Zone which was the focus of Wardrop's 2007 mineral resource estimate.

Avalon's Thor Lake rare metal project is located in Canada's Northwest Territories, 4 km north of the Hearne Channel of Great Slave Lake and approximately 100 km southeast of the City of Yellowknife.

The property encompasses five contiguous mining leases totalling 4,249 ha (10,449 acres). The mining leases have a 21-year life and are registered to, and wholly owned by, Avalon. Each lease is renewable in 21-year increments. The property is subject to two underlying royalty agreements entitling the royalty holders to a cumulative 5.5% net smelter return (NSR) royalty.

The mineral deposits at Thor Lake formed from late magmatic, hydrothermal and supercritical phases during the evolution of the Aphebian-age Blatchford Lake Intrusive Complex. A description of the geology of the area has been given by Davidson (1978) and of the mineral deposits themselves by Trueman, Pederson, de St. Jorre and Smith (1989). Principal rock types in the area include syenites, granites and their altered equivalents, which were intruded into Archean metasedimentary rocks of the Yellowknife Supergroup.

Six deposits or zones having rare metal mineralization of potential economic interest have been identified on the Thor Lake property. These are: the North T, South T, R, S, Fluorite and Lake Zone deposits. The North T and South T deposits are characterized by yttrium plus heavy rare earth[*] elements (Y+HREE), light rare earth elements (LREE), beryllium, niobium and zirconium, while the Lake Zone deposit contains Y+HREEs, LREEs, tantalum, niobium and zirconium with the Zr associated with high hafnium. The other deposits, less explored, are noted for their Y+HREE

[*]The rare earth elements are by convention divided into two subgroups; the Light Rare Earth element subgroup including those elements of atomic numbers 57 (lanthanum) to 62 (samarium), and the Heavy Rare Earth element including atomic numbers 63 (europium) to 71 (lutetium).

contents. Wall rocks mantling the deposits as well as biotite within the Lake Zone are notably enriched in gallium.

In the Lake Zone deposit, the LREEs are principally contained in monazite, allanite, synchisite and bastnaesite. The Y+HREE are principally contained in fergusonite and zircon. Niobium and tantalum are contained in accessory columbite as well as fergusonite. Hafnium is contained in zircon. Gallium is concentrated in biotite and feldspar.

Typically, as in other REE deposits, the REEs (or lanthanide elements) at Thor Lake occur in fixed proportions in their constituent minerals as shown in Table 1.1 and remain relatively constant in those minerals throughout the deposits.

Table 1.1 Lanthanide Distribution in the Thor Lake REE Minerals [(1)]

Metal Oxide	Fergusonite	Zircon	Allanite	Monazite	Low CaO	High CaO
Lanthanum Oxide (La_2O_3)	0.30%	6.09%	27.13%	26.46%	23.91%	20.46%
Cerium Oxide (Ce_2O_3)	4.40%	14.62%	51.20%	59.28%	49.15%	47.31%
Praesodymium Oxide (Pr_2O_3)	1.70%	1.17%	5.30%	7.46%	5.86%	6.18%
Neodymium Oxide (Nd_2O_3)	15.60%	13.12%	15.18%	1.77%	17.99%	20.84%
Samarium Oxide (Sm_2O_3)	10.40%	6.20%	1.21%	2.72%	1.56%	1.96%
Europium Oxide (Eu_2O_3)	1.60%	-	-	0.34%	0.32%	0.48%
Gadolinium Oxide (Gd_2O_3)	14.30%	7.11%	-	1.42%	0.87%	1.32%
Terbium Oxide (Tb_2O_3)	1.80%	-	-	-	-	-
Dysprosium Oxide (Dy_2O_3)	9.80%	2.62%	-	0.20%	0.07%	0.26%
Holmium Oxide (Ho_2O_3)	1.20%	-	-	-	-	-
Erbium Oxide (Er_2O_3)	4.10%	3.54%	-	-	-	-
Thulium Oxide (Tm_2O_3)	0.70%	-	-	-	-	-
Ytterbium Oxide (Yb_2O_3)	4.40%	6.42%	-	-	-	-
Lutetium Oxide (Lu_2O_3)	0.70%	-	-	-	-	-
Yttrium Oxide (Y_2O_3)	29.05%	39.12%	-	0.34%	0.27%	1.20%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Y_2O_3+HREO%	**67.6%**	**58.8%**	**0.0%**	**2.3%**	**1.5%**	**3.3%**

(1) After Pinckston, 1989, Mariano, 2006, and Mitchell 2007. Grammatikopoulos (2008).

The REE distribution in the Lake Zone fergusonite is remarkable for its enrichment in mid-atomic number lanthanides from neodymium to dysprosium, which is ideally suited to current market demand from magnet manufacturers serving the automotive sector. This is an important observation as it implies that this material will have a competitive advantage in the marketplace and the resulting clean concentrate could command a premium price.

The Lake Zone Mineral Resource Model was built using Datamine Studio 3 3D geological modelling and resource estimation software. The estimate was carried out using ordinary kriging of 15 Rare Earth Oxide grades, density and six other elements of interest.

The new resource estimate focuses on the recently discovered Basal Zone which contains the most interesting grades due to its enrichment in the more valuable heavy rare earths, particularly in fergusonite. The results are summarized below in Table 1.2 at a Total Rare Earth Oxide (TREO) cut-off grade of 1.6%.

Table 1.2 Lake Zone Mineral Resource Summary

Zone	Resource Class	Cut-off TREO (%)	Tonnes (x1000)	TREO (%)	HREO (%)	H/T (%)
Basal	Indicated	1.60	2,186	2.14	0.43	20.0
Upper	Indicated	1.60	1,873	1.96	0.19	9.7
Total	Indicated	1.60	4,059	2.06	0.32	15.5

Zone	Resource Class	Cut-off TREO (%)	Tonnes (x1000)	TREO (%)	HREO (%)	H/T (%)
Basal	Inferred	1.60	28,447	1.99	0.44	22.1
Upper	Inferred	1.60	32,707	2.10	0.17	8.2
Total	Inferred	1.60	61,154	2.05	0.30	14.5

Notes:

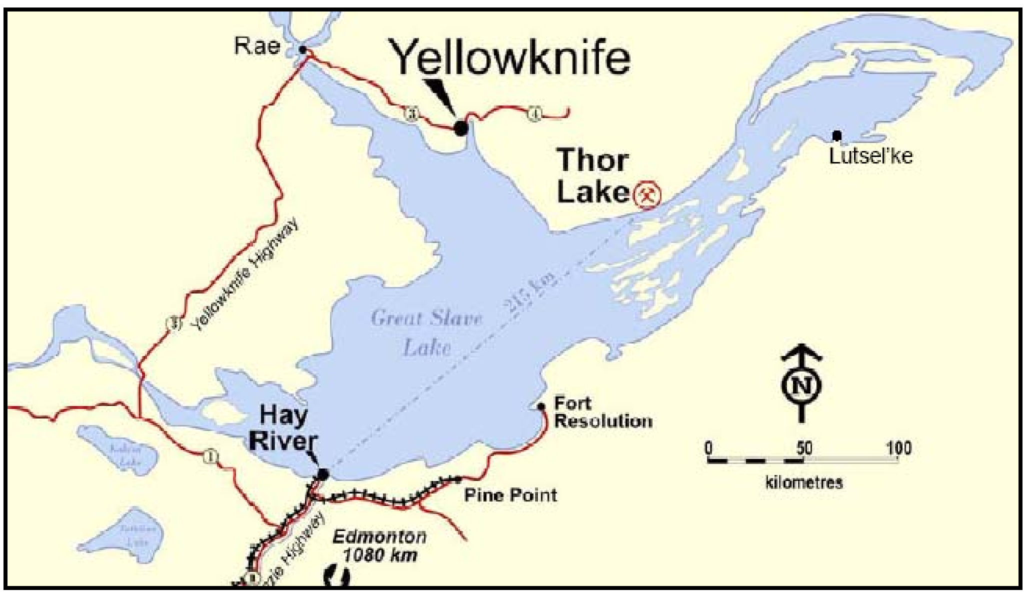
1. HREO (Heavy Rare Earth Oxides) is the total concentration of: Y_2O_3, Eu_2O_3, Gd_2O_3, Tb_2O_3, Dy_2O_3, Ho_2O_3, Er_2O_3, Tm_2O_3, Yb_2O_3 and Lu_2O_3.
2. TREO (Total Rare Earth Oxides) are HREO plus: La_2O_3, Ce_2O_3, Pr_2O_3, Nd_2O_3 and Sm_2O_3
3. Wardrop considers a 1.60% TREO cut-off grade to be a reasonable estimate of potentially economic resources, based on a preliminary estimate of operating costs totalling $197.00/tonne.
4. To determine a recommended cut-off grade, Gross Metal Values (GMV) were calculated using four- year average REE prices (where available) and assuming recoveries of: 74.6% for Y_2O_3 and all rare earth elements. The metallurgical recoveries include both mineral processing (flotation) and hydrometallurgical recoveries.
5. H/T is the ratio of HREO to TREO expressed as percent.

2.0 INTRODUCTION AND TERMS OF REFERENCE

The purpose of this report is to prepare for Avalon an NI 43-101 compliant technical report and new mineral resource estimate for the Lake Zone deposit on the Thor Lake Property. The report utilizes the data from new drilling completed on this property in 2007 and 2008.

The Thor Lake property encompasses an area of 4,249 ha (10,449 acres) hosting six rare metal bearing mineral deposits. Located in the Mackenzie Mining District of the Northwest Territories, the property is approximately 100 km southeast of Yellowknife and 5 km north of the Hearne Channel of Great Slave Lake (see Figure 2.1).

Figure 2.1 Thor Lake Property Location

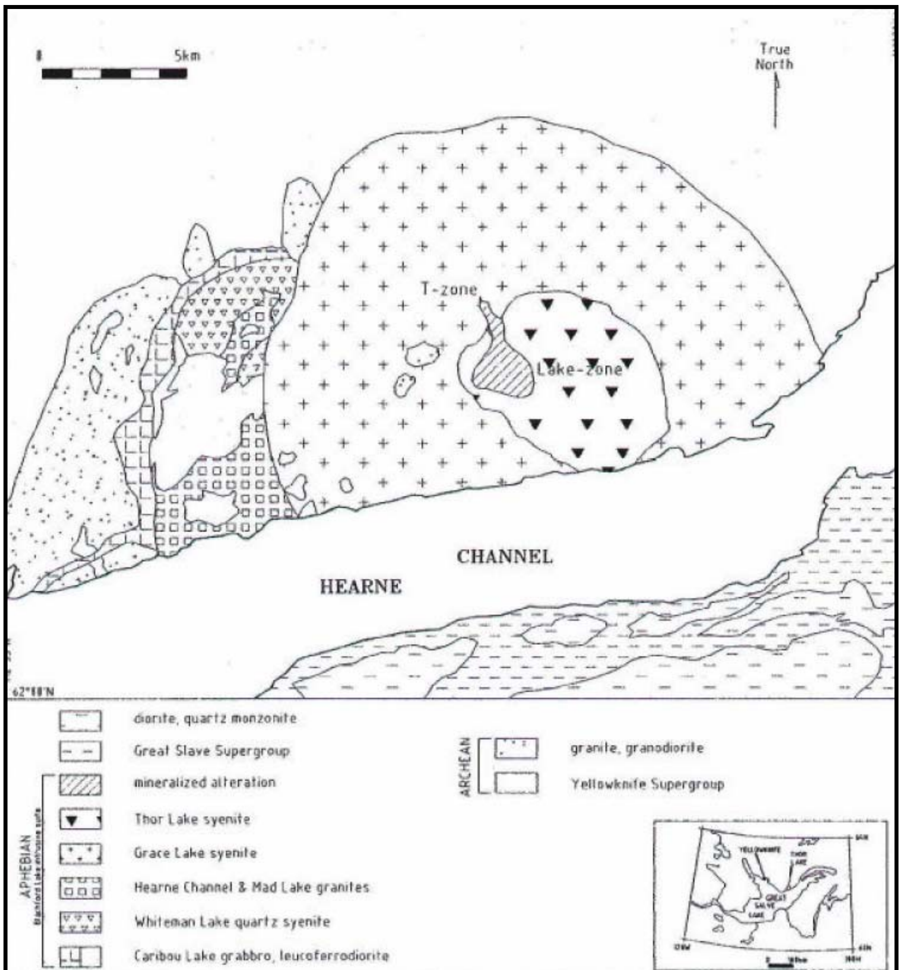


The mineral deposits occur in six distinct mineralized zones that are variably enriched in Y, heavy and light REE, Be, Ta, Nb, Zr, and Ga (see Table 2.1). The mineralization occurs within syenites and granites of the multi-phase Blatchford Lake Intrusive Complex; a series of sub-circular intrusive rocks of Aphebian age that range from gabbro to syenite and granite intrusive into Archean metasedimentary rocks of the Yellowknife Supergroup (see Figure 2.2).

Table 2.1 Mineral Deposit Nomenclature and Elements of Interest

Zone		Sub-Zone	Elements of Interest
T Zone	North T Zone	F	LREE
		E	Be
		D	Y, HREE, LREE, Be, Nb, Zr
		C	Y, HREE, LREE, Be, Nb, Zr
		Y	Y, HREE, LREE
	South T Zone		Y, HREE, LREE, Be, Nb, Zr, Ga
Lake Zone			Y, HREE, LREE, Ta, Nb, Zr, Ga
R Zone			Y, HREE
S Zone			Y, HREE
Fluorite Zone			Y, HREE

Figure 2.2 Generalized Geology of the Thor Lake Area (after Davidson, 1978)



Generalized Geological Map of the Blachford Lake intrusive suite showning the location of the T- and Lake- zones (after Davidson, 1978, 1982)

Two of the zones, the T Zone and the Lake Zone, because of their size and contained elements of interest, are better defined through drilling and have undergone metallurgical testing.

The Lake Zone is defined by drilling and limited exposure subcrops out over an aerial extent of approximately 2 km^2. It can be considered open, particularly in the south and west. Interest in the Lake Zone in the past has focused on Ta, largely thought to be in columbo-tantalite and latterly in Y and the HREE. Recent work by Grammatikopoulos (2001, 2008), LeCouteur (2002) and Mariano indicates that the Ta, Y and HREEs are all hosted in the mineral fergusonite and Y+HREE and Zr in zircon. LREEs are hosted in allanite, monazite, synchysite and bastnaesite. Nb is present in ubiquitous ferro-columbite, Zr and Hf in zircon and Ga in both wall rock feldspars and biotite.

In the past, Y and the REEs in the mineralized zones at Thor Lake were only considered as potential by-products of primary beryllium or tantalum production. However, and in view of a strengthened and growing demand for these elements with their concomitant price increases, the Y and REE potential at Thor Lake warrants a new consideration.

In addition, a past Preliminary Economic Assessment (PEA), or scoping study, completed by Wardrop in 2006 of the Thor Lake Project focused on the Y and HREEs. It was undertaken to quantify the resource at Thor Lake, assess its recovery and determine the marketability of the resulting commodities. This mineral resource update has been generated in compliance with the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) standards and best practices and the report complies with National Instrument (NI) 43-101 standards.

Christopher Moreton, P.Geo, visited the Thor Lake site on April 21st to 23rd, 2008, in the company of J.C. Pedersen, P.Geo. Co-authors of this report were Joanne Paul, P. Geo. and Thomas C. Stubens, P. Eng. of Wardrop.

Trueman and Pedersen, representing Avalon, have variously been involved in work on the Thor Lake deposits since 1979, and Mercer and Hudgins since 2007. Trueman, Pedersen and Mercer have been closely involved in all aspects of the following assessment while Hudgins has been involved on behalf of Avalon in preparation of data for the report.

2.1 TERMS OF REFERENCE

Avalon commissioned Wardrop to prepare an NI 43-101 compliant technical report on the Y and REE resource estimation for the Lake Zone deposit at Thor Lake. This work entailed estimating mineral resources in conformance with the CIM Mineral Resource and Mineral Reserve definitions referred to in the NI 43-101 Standards and Disclosure for Mineral Projects. It also involved the preparation of a technical report in compliance with Form 43-101F1 (Technical Reports). The inventory of the resources represents an update to existing historic resource estimates delineated from both historical and recent drilling data.

3.0 RELIANCE ON OTHER EXPERTS

The ensuing report finds basis in exploration of the mineral deposits at Thor Lake in relation to metallurgical work that has been undertaken by the former property owners. Avalon is also currently executing metallurgical process work through SGS Group (SGS) Labs.

Literature sources have also been extensively utilized and where used, are cited accordingly as references.

4.0 PROPERTY DESCRIPTION AND LOCATION

4.1 PROPERTY LOCATION

The Thor Lake property is located in Canada's Northwest Territories, 100 km southeast of the capital city of Yellowknife and 5 km north of the Hearne Channel on the East Arm of Great Slave Lake. The property is within the Mackenzie Mining District of the Northwest Territories and Thor Lake is shown on National Topographic System (NTS) map sheet 85I/02 at approximately 62°06'30''N and 112°35'30''W (6,886,500N, 417,000E – NAD83).

4.2 PROPERTY DESCRIPTION

The Thor Lake property comprises five contiguous mineral leases totalling 4,249 ha (10,449 acres), pertinent data for which are shown in Table 4.1.

Table 4.1 Mining Leases – Thor Lake

Lease Number	Area (ha)	Legal Description	Effective Date	Expiration Date
3178	1,053	Lot 1001, 85 I/2	22/05/1985	22/05/2027
3179	939	Lot 1000, 85 I/2	22/05/1985	22/05/2027
3265	367	Lot 1005, 85 I/2	2/3/1987	2/3/2029
3266	850	Lot 1007, 85 I/2	2/3/1987	2/3/2029
3267	1,040	Lot 1006, 85 I/2	2/3/1987	2/3/2029
Total	**4,249**			

The mining leases shown in Table 4.1 have a 21-year life and each lease is renewable in 21-year increments.

Annual payments of $2.47/ha ($1.00 per acre) are required to keep the leases in good standing.

Avalon owns 100% of all of the leases subject to various legal agreements described in Section 4.2.1 below.

4.2.1 LEGAL AGREEMENTS, UNDERLYING ROYALTY INTERESTS

Two underlying royalty agreements exist on the Thor Lake property: the Murphy Royalty Agreement and the Calabras/Lutoda Royalty Agreement, both of which originated with Highwood Resources Ltd., the original developer of the property.

The Murphy Royalty Agreement, signed in 1977, entitles J. Daniel Murphy to a 2.5% NSR. The Murphy Royalty Agreement applies to the entire Thor Lake property and the royalty is capped at an escalating amount indexed to inflation.

The Calabras/Lutoda Royalty Agreement, signed in 1997, entitles Calabras (Canada) Ltd. (Calabras) to a 2% NSR and Lutoda Holding Ltd. (Lutoda) to a 1% NSR.

4.2.2 LEGAL SURVEY

The Thor Lake mineral leases have been legally surveyed and are recorded on a Plan of Survey, Number 69408 M.C. in the Legal Surveys Division of the Federal Department of Energy, Mines and Resources, Ottawa. The perimeter boundaries of the lease lots were surveyed as part of the leasing requirements.

4.2.3 MINERALIZED ZONES

The six areas of mineralization at Thor Lake have been noted above in Section 2.0 and detailed descriptions follow in Sections 7.1 through 9.2 below.

4.2.4 ENVIRONMENTAL LIABILITIES

Highwood held a land use permit that allowed for clean up, maintenance and exploration on the property. The permit expired on October 26, 2002. Under the Mackenzie Valley Land and Water Resources Act and Regulations, the Mackenzie Valley Land and Water Board (MVLWB) administers land use permits. The Mackenzie Valley Resource Management Act (MVRMA) allows local and particularly aboriginal input into land and water use permitting. The MVRMA establishes a three-part environmental assessment process:

- Preliminary screening
- Environmental assessment
- Environmental impact review (panel review)

For a production permit, the Thor Lake Project will require environmental assessment, as well as an environmental impact review.

Subsequent to the acquisition of the property, and completion of community engagement meetings, Avalon applied to the MVLWB for an exploration permit, and a two year permit was granted as of July 2007. It was under this permit that the drilling programs in 2007 to the present were conducted.

Past exploration on the Thor Lake property included underground bulk sampling, drilling and trenching. Accordingly, there is little surface disturbance from exploration activities. Apart from a trailer camp, miscellaneous buildings, a 60,000 gallon six tank farm, a tent camp and a core storage area located on the property, there are no other environmental liabilities left by past exploration activities. The diesel fuel remaining in the tank farm has been consumed during past exploration. Avalon is seeking ways to safely remove the tanks. The trailer camp has been rehabilitated. The company has undertaken extensive general cleanup of material left from previous exploration utilizing First Nations labour.

Access to the underground workings has been barricaded and the mine workings allowed to flood. Warning fencing has been installed around the ramp entrance.

5.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

5.1 TOPOGRAPHY, ELEVATION AND VEGETATION

The Thor Lake area is characterized by low relief, between 230 m and 255 m asl and subdued topography. The area is typical boreal forest of the Canadian Shield and is primarily covered by open growths of stunted spruce, birch, poplar and jack pine which mantle isolated, glaciated rocky outcrop. Approximately one third of the property is occupied by lakes and swamps; the largest lake being Thor Lake at 238 m above mean sea level and having a surface area of approximately 136 ha. Thor Lake is generally shallow with typical depths of the order of 3 to 4 m.

Baseline environmental studies have shown that discontinuous permafrost is present in the area. The exact distribution is not known, but it is believed to be prevalent in muskeg regions. The permafrost is reported to have high ice content.

5.2 ACCESSIBILITY

The Thor Lake property is accessible seasonally by boat, winter road and/or by float or ski-equipped aircraft from either Yellowknife or Hay River located on the southwest shore of Great Slave Lake. The freeze-up and break-up periods preclude ready access to the area except by helicopter. At present the nearest road access is the Ingraham Trail, a NWT Government all season highway that is 50 km in a direct line from the property. It may be possible to build a road link over this distance. Without a road link a mining operation at Thor Lake would require a suitably sized permanent airstrip, which would allow for a minimum of Twin-Otter-sized aircraft service from Yellowknife throughout the year.

During the summer ice-free period, equipment can be barged to a landing site on the Hearne Channel on Great Slave Lake and then transported by existing access road approximately 9 km to the mine site at the North T Zone. During the winter months, heavy equipment and bulk materials can be brought in by winter roads on the ice cover over Great Slave Lake. During the freeze-up and break-up periods, extra storage will be necessary for fuel and bulk supplies that cannot be brought in by aircraft.

Dock facilities will need to be constructed on Great Slave Lake to enable the loading and offloading of cargo going to or coming from Hay River. In addition, the access road from the wharf to the site will need to be upgraded and proper access roads will need to be constructed around the site.

5.3 CLIMATE

The climate is typical of Northern Canada with cold, dark winters and a fairly warm, short summer with long daylight hours. Temperatures range from around extremes of -50°C to +30°C, with normal winter temperatures from mid-November to mid-April of -15°C to -35°C. Temperatures from mid-May to the end of September range from 0°C to about +20°C. Precipitation is light and similar to Yellowknife, which receives 15 cm of rain and 135 cm of snowfall annually.

Most lakes in the area do not freeze to the bottom and process water is readily available year-round. Freeze-up commences in late October and break-up of the majority of the lakes in the area is generally complete by late May. Great Slave Lake freezes later and is ice-free later than the smaller lakes.

5.4 INFRASTRUCTURE

Yellowknife, the capital city of the NWT, is located 100 km by air northwest of Thor Lake and has a population of approximately 20,000. Good supporting infrastructure can be supplied from Yellowknife.. The Yellowknife economy is now supported mainly by government services although the community acts as a major transportation hub for mining and mineral exploration throughout the NWT and Nunavut.

The project is situated in the Akaitcho Territory, an area that is subject to a comprehensive land claim negotiation involving four communities, each located roughly 100 km from the project – the Yellowknives Dene, the Lutsel k’e Dene and the Deninu Kue First Nations.

The Yellowknives Dene consists of two communities, N’Dilo and Dettah, each having over 250 residents. N’Dilo is located on Latham Island in the northern part of the City of Yellowknife. Dettah, accessible by road, is located southeast of Yellowknife, across Yellowknife Bay. Both are members of the Yellowknife Dene and are readily accessible. The Yellowknives Dene assert that Thor Lake lies within their traditional territory known as the Chief Drygeese Territory.

Fort Resolution is located on the southeast coast of the main body of Great Slave Lake in Resolution Bay. The Deninu Kue First Nation is based in Fort Resolution and has a population of over 500. The community is serviced by road from Hay River and by air from Yellowknife.

The community of Lutsel K'e is located on Christie Bay on the East Arm of Great Slave Lake and is accessible by air or boat. It has a population of over 250.

The town of Hay River, located on the south shore of Great Slave Lake where the Hay River enters the lake, extends south from the lake along the west bank of the river. The largest aboriginal community in the Hay River area is the Hay River Reserve, which is located on the east bank of the Hay River across from the town. Another community, the West Point First Nation, is located on the west end of Vale Island in the Town of Hay River. Hay River is accessible by air, rail and Highway 3 from Edmonton, Alberta.

Fort Providence is located on the Mackenzie River about 40 km downstream from the outflow of Great Slave Lake. The town is serviced by Highway 3 between Hay River and Yellowknife.

Mining operations in the North have typically drawn personnel from Alberta, Saskatchewan, Yellowknife and local First Nations and Metis communities. In an operation at Thor Lake, local First Nations communities may include Dettah N'Dilo, Deninu Kue, Hay River Reserve, Fort Resolution and Lutsel K'e as sources of personnel. In addition there are two Metis associations that are based close to the project – the Northwest Territory Metis Association and the North Slave Metis Association. All of the mining operations in the North (outside of Yellowknife) have implemented policies related to maintaining a certain level of First Nation employment, and Avalon will need to develop hiring and training policies with aboriginal employees.

The closest source of power to Thor Lake is Yellowknife, where the source is largely hydro generation from the Snare dam. However, the dam barely provides enough power for Yellowknife. The other hydroelectric generating facility in the general area is the Taltson River dam locating 200 km to the south near Fort Smith. As in other mining operations in the North, such as Lupin, Ekati and Diavik, it may be necessary to use diesel power generation for any mining operation at Thor Lake although there are plans being considered to build a major transmission line north from the Taltson River dam to serve the diamond mines and possibly Yellowknife. Two out of the four routes being considered go over the Thor Lake project.

Fuel can be barged to the site in the summer and trucked to the site in the winter. During the transition periods in the spring and fall neither barge, nor winter road access would be possible, and a minimum of four months fuel storage capacity would be considered necessary on site.

Bulk sampling via decline ramp was conducted in the North T Zone of the Thor Lake Property in 1985. Exploration roads, a trailer camp, vehicle sheds, fuel tanks, vehicles and a miner's dry remain from this period of exploration. Necessary infrastructure and access will nevertheless have to be constructed in order to support a larger scale mining operation.

Water supply is available from any one of the surrounding lakes, including Thor Lake or Long Lake. Water tanks may need to be built in the plant area to act as storage and as a reserve for fire protection. All water lines exposed to the elements will need to be insulated and heat traced.

As there are no land based communications systems in the area it will be necessary to install a satellite communications system.

6.0 HISTORY

The Thor Lake area was first mapped by J.F. Henderson and A.W. Joliffe of the Geological Survey of Canada (GSC) in 1937 and 1938. According to National Mineral Inventory records of the Mineral Policy Sector, Department of Energy, Mines and Resources, the first staking activity at Thor Lake dates from July 1970 when Odin 1-4 claims were staked by K.D. Hannigan for uranium. Shortly after, the Odin claims were optioned to Giant Yellowknife Mines Ltd. and subsequently, in 1970 were acquired by Bluemount Minerals Ltd.

In 1971, the GSC commissioned an airborne radiometric survey over the Yellowknife region that outlined a radioactive anomaly over the Thor Lake area (GSC Open File Report 124). Simultaneously, A. Davidson of the GSC initiated mapping of the Blatchford Lake Intrusive Complex. It has subsequently become clear that this radiometric anomaly is largely due to elevated thorium levels in the T Zone.

Four more claims (Mailbox 1-4) were staked in the area in 1973. No description of any work carried out on the claims is available and both the Odin and Mailbox claims were allowed to lapse. No assessment work was filed.

In 1976, Highwood Resources Ltd., in the course of a regional uranium exploration program, discovered niobium and tantalum on the Thor Lake property. The property was staked as the Thor 1-45 claims and the NB claims were added in 1976 and 1977. From 1976 and 1979, exploration programs included geological mapping, sampling trenching on the Lake, Fluorite, R, S and T Zones. Twenty-two drill holes were also completed, seven of these on the Lake Zone. This work resulted in the discovery of significant concentrations of niobium, tantalum, yttrium and REEs. Hole 79-1 intersected 0.67% Nb_2O_5, and 0.034% Ta_2O_5 over 24.99 m. Results also indicated a general paucity of uranium mineralization and that the anomalous radioactivity was due to thorium. Following this and inconclusive lake bottom radiometric and radon gas soil surveys, Calabras, a private holding company, acquired a 30% interest in the property through financing further exploration by Highwood. This was done through Lutoda Holdings, a company incorporated in Canada and owned by Calabras.

Recognizing a large potential resource at Thor Lake, Placer Development Ltd. (Placer) optioned the property from Highwood in March 1980 to further investigate the tantalum and related mineralization. Placer conducted magnetometer, very low frequency (VLF) electro-magnetic (EM) and scintillometer surveys on the Lake Zone. Thirteen holes were initially drilled in 1980. This was followed by five more in 1981 focused around drill hole 80-05 (43 m grading 0.52% Nb_2O_5 and 0.034% Ta_2O_5). Preliminary metallurgical scoping work was also conducted, but, when the mineralization did not prove amenable to conventional metallurgical extraction. Placer relinquished its option in April of 1982.

From 1983 to 1985, the majority of the work on the property was concentrated on the T Zone and included geochemical surveys, surface mapping, significant drilling, surface and underground bulk sampling, metallurgical testing and a detailed evaluation of the property by Unocal Canada. During this period, a gravity survey was conducted to delineate the extent of the Lake Zone. Five holes were also drilled in the Lake Zone to test for high grade tantalum-niobium mineralization and to determine zoning and geological continuity. Two additional holes were completed at the northeast end of Long Lake to evaluate high yttrium and REE values obtained from nearby trenches.

In August of 1986, the property was joint-ventured with Hecla Mining Company of Canada Ltd. (Hecla). By completing a feasibility study and arranging financing to bring the property into production, Hecla could earn a 50% interest in the property. In 1988, earlier holes were re-assayed and 19 more holes were drilled into the Lake Zone, primarily in the southeast corner, to further test for Y and REE. However, in 1990, after completing this and considerable work on the T Zone, including some limited in-fill drilling, extensive metallurgical testing conducted at Lakefield and Hazen Research Ltd. (Hazen) in Denver and conducting a marketing study on Be, Hecla withdrew from the project. In 1990, control of Highwood passed to Conwest Exploration Company Ltd. (Conwest) and the Thor Lake project remained dormant until 1996, at which time Conwest divested itself of its mineral holdings. Mountain Minerals Company Ltd. (Mountain), a private company controlled by Royal Oak Mines Ltd., acquired the 34% controlling interest of Highwood.

In 1997, Mountain merged with Highwood under the name Highwood, resulting in an extensive re-examination of Thor Lake that included a proposal to extract a 100,000 t bulk sample. Applications were submitted for permits that would allow for small-scale development of the T Zone deposit, as well as for processing over a four to five year period. In late 1999, the application was withdrawn.

Royal Oak's subsequent bankruptcy in 1999 resulted in the acquisition of the control block of Highwood shares by Dynatec Corporation (Dynatec). In 2000, Highwood initiated metallurgical, marketing and environmental reviews by Dynatec.

In 2001, Navigator Exploration Corp. (Navigator) entered into an option agreement with Highwood. Navigator's efforts were focused on conducting additional metallurgical research at Lakefield in order to define a process for producing a marketable tantalum concentrate from the Lake Zone. These efforts produced a metallurgical grade Ta/Zr/Nb/Y/REE bulk concentrate. The option was dropped in 2004 however, in view of falling Ta prices and low Ta contents in the bulk concentrate.

Beta Minerals Inc. (Beta) acquired Highwood's interest in the Thor Lake property in November, 2002 under a plan of arrangement with Dynatec. No work was conducted at Thor Lake by Beta and in May of 2005 Avalon purchased from Beta 100% interest and full title, subject to royalties, to the Thor Lake property.

In 2005, Avalon conducted extensive re-sampling of archived Lake Zone drill core to further assess the Y and HREE resources on the property. In 2006, Wardrop was retained to conduct a PEA of the Thor Lake deposits ("Preliminary Economic Assessment on the Thor Lake Rare Metals Project, NT" Wardrop Document No. 0551530201-REP-R0001-03). In 2007 Avalon commenced further drilling of the Lake Zone.

6.1 HISTORICAL MINERAL RESOURCE AND MINERAL RESERVE ESTIMATES

A number of resource estimates have been carried out at Thor Lake. These variously included the Lake Zone, the North T Zone, and the South T Zone. These are described accordingly.

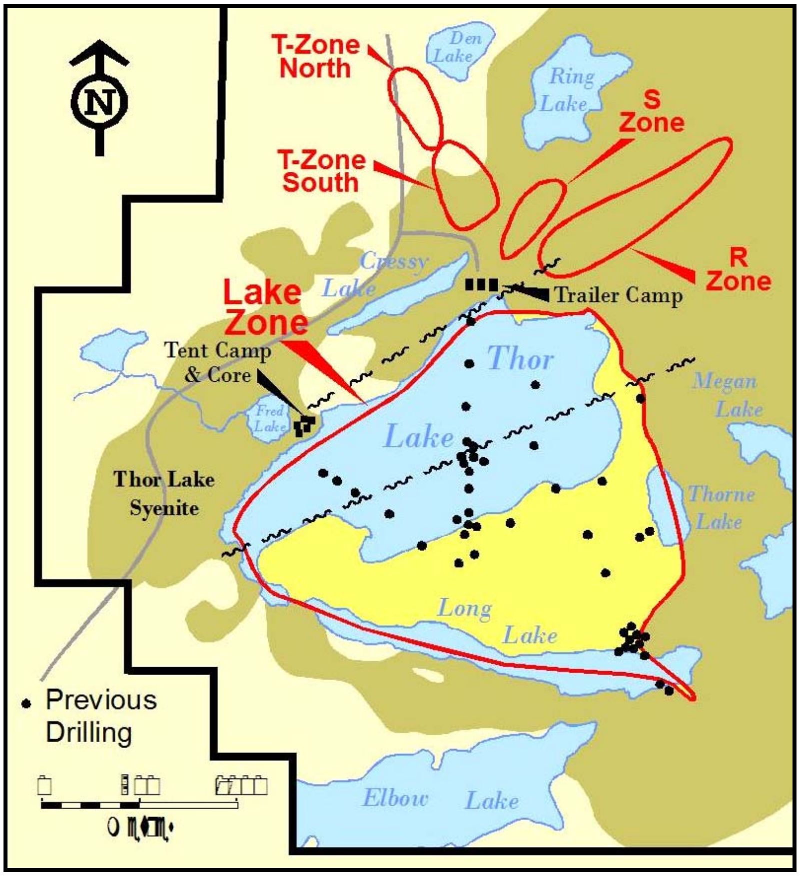
6.1.1 *LAKE ZONE*

The Lake Zone is the largest of the six mineralized zones found on Avalon's Thor Lake property (see Figure 6.1). It encompasses an area of approximately 2 km^2, approximately 70 percent of which has been drill tested on a nominal 200 m basis. The outcrop extent of the Lake Zone is less than 10 percent, and most of the rock outcropping has been mapped by Johnson (1978), and subsequently in detail by Pedersen (unpublished company documents).

PLACER ESTIMATE – 1981

Placer Development Ltd. generated a mineral resource estimate based on drilling carried out up to and including 1981. The estimate of 64 million tonnes is anecdotal, having been published in the, then current, annual reports of Highwood Resources. No cut-off criteria were specified. This resource estimate is historical and does not comply with NI 43-101 or the CIM Standards on Mineral Resources and Reserves. Wardrop has not verified this historical estimate. It is only mentioned for historical completeness.

Figure 6.1 Mineralized Zones at Thor Lake



WARDROP ESTIMATE – 2007

Wardrop generated an NI 43-101 compliant resource model for the Lake Zone based on pre-2007 drill hole data. The report states "the computer generated model was based on validated historic analytical data supplemented by (then), new REE assay data, new rock density data and a preliminary geological interpretation." The results of this work are shown in Table 6.1.

Table 6.1 Summary of Inferred Mineral Resources for the Lake Zone Deposit

Cut-off (%)	Tonnes	$TREO+Y_2O_3$ (%)	Ta_2O_5 (%)	Nb_2O_5 (%)	ZrO_2 (%)
0.10 Y_2O_3	14,005,000	1.23	0.025	0.33	1.73
0.05 Y_2O_3	83,224,000	0.99	0.025	0.31	1.96
0.01 Y_2O_3	375,410,000	0.41	0.014	0.22	1.19

These resources were categorized as "Inferred" due to the relatively wide spacing of the drill holes and the absence of drilling in many parts of the deposit.

6.1.2 NORTH T-ZONE

The North T Zone was nominally drilled on 15 m centres. In the middle of the deposit, drill hole spacing in places is as close as 7 m and some of the drill holes were twinned for metallurgical samples. The drilling delineated a bowl-shaped configuration of alteration and mineralization, with a keel-like feeder zone beneath the deposit extending south-easterly to, and underlying the South T Zone.

Five resource estimates have been generated for the North T Zone since 1985 and the reader is referred to detailed descriptions of these estimates in the Wardrop report of 2007. Four of the resource estimates are non NI 43-101 compliant having pre-dated current regulation. The Wardrop estimate, which is NI 43-101 compliant, is presented below in Table 6.2 and summarizes the resources in the various sub-zones of the North T deposit.

Table 6.2 Summary of Indicated Mineral Resources for the North T Deposit

Sub-Zone	Cut-Off	Tonnes	TREO+Y_2O_3 (%)	BeO (%)	Nb_2O_5 (%)
C,D,E	0.40 BeO	498,409	0.72	0.98	0.50
F	0.10 Ce_2O_3	43,877	6.50	0.16	0.01
Y	0.04 Y_2O_3	593,815	0.45	0.08	0.59
Total		**1,136,101**	**0.71**	**0.48**	**0.53**

6.1.3 SOUTH T-ZONE

The South T Zone is drilled, in part, on 30 m centres. A historic estimate of the resource was generated by Lindsey (1987) and is tabulated below (Table 6.3).

Table 6.3 Historic Estimate of South T-Zone Potential Reserves

Cut-Off	Tonnes	Density	Y_2O_3 (%)	BeO (%)	Ce_2O_3 (%)	Nb_2O_5 (%)
0.30 % BeO	1,135,499	3.02	<0.1	0.62	<0.1	0.484
0.10 % BeO	1,254,681	3.02	<0.1	0.18	0.152	0.362
Total	**2,390,180**	**3.02**	**<0.1**	**0.39**	**0.104**	**0.410**

This resource estimate is historical and does not comply with NI 43-101 or the CIM Standards on Mineral Resources and Reserves. Wardrop did not verify this historical estimate.

7.0 GEOLOGICAL SETTING

7.1 REGIONAL GEOLOGY

The following section is summarized from Trueman et al. (1988), LeCouteur (2002) and Pedersen et al. (2007).

The Thor Lake mineral deposits occur within the Aphebian Blachford Lake Complex, which includes Archean Yellowknife Supergroup metasedimentary rocks of the southern Slave geologic province. The complex is of variably alkaline character and intrusive phases vary successively from early peridotite, pyroxenite and gabbro through leucoferrodiorite, quartz syenite and granite, to peralkaline granite and a late syenite (Davidson, 1982). There appear to be successive intrusive centres; an early western centre that is truncated by a larger second centre consisting of the Grace Lake Granite and the Thor Lake Syenite. Nepheline syenite underlies Thor Lake Syenite and is only known from drilling on the Lake Zone.

Davidson (1978) subdivided the Blachford Lake Complex into six texturally and compositionally distinct plutonic units as follows: Caribou Lake Gabbro, Whiteman Lake quartz Syenite, Hearne Channel Granite, Mad Lake Granite, Grace Lake Granite and Thor Lake Syenite. Based on exposed crosscutting relationships of dykes and main contacts, Davidson recognized a sequence of five intrusive events. The rocks of the last intrusive event, being compositionally and spatially distinct, are subdivided into the Grace Lake Granite and the Thor Lake Syenite, although they bear no obvious intrusive relationship to each other to indicate a significant difference in time of emplacement. Davidson and Trueman et al. have further shown that the intrusions were petrochemically related.

Recent dating of the complex supports the view that all the intrusions are related as the main eastern intrusive, and the western intrusive centres exhibit comparable ages. The Hearne Channel Granite has been dated at 2,175 $\pm$5 million years, the Whiteman Lake Syenite at 2,185 $\pm$5 million years (Bowring et al, 1984) and the Grace Lake Granite at 2,176 $\pm$1.3 million years (Sinclair and Richardson, 1994).

Henderson (1985) reports that small dioritic plugs assigned to the Compton Lake Intrusive Suite cut the Grace Lake granite and diabase dykes of the 1,200 million year old Mackenzie and the 2,000 million year old Hearne dyke swarm cuts most of the members of the Blachford Lake Complex.

Gravity modeling by Birkett et al. (1994) suggests that the large area of granitic and syenitic rocks of the eastern intrusive centre form a thin tabular body with a maximum thickness of one kilometer. In contrast, the Caribou Lake Gabbro in the western centre is thought to be deep rooted.

7.2 LOCAL GEOLOGY

Most of the Thor Lake Property is underlain by the Thor Lake Syenite where it occurs in the centre of the Grace Lake Granite. The T Zone deposits are seen to cross both rock types which are only demarcated by the presence or absence of quartz, and the Lake Zone is seen confined solely to the Thor Lake Syenite.

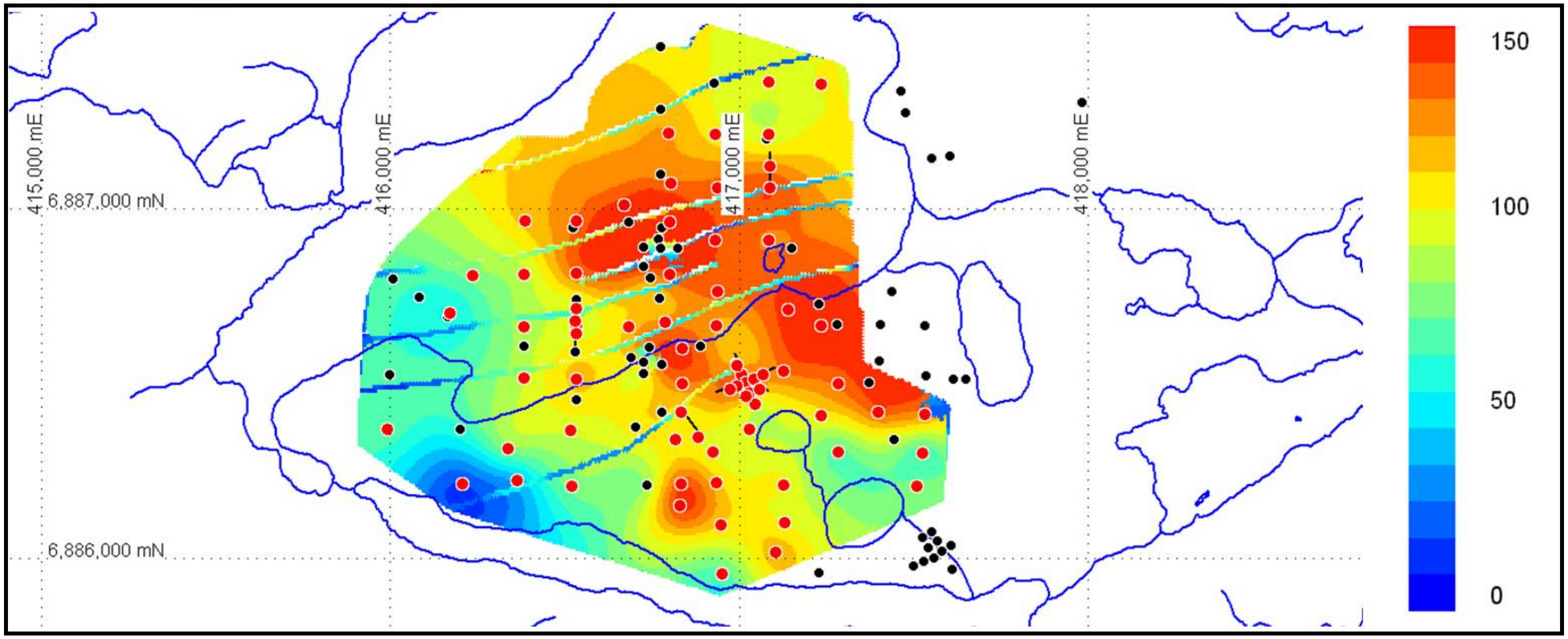
The Grace Lake granite is a coarse-grained, massive, equigranular, riebeckite-perthite granite with about 25% interstitial quartz. Accessories include fluorite, zircon, monazite, apatite, sphene, iron and titanium oxides, astrophyllite, an alkali pyroxene and secondary biotite. Near the contact of the Grace Lake Granite with the Thor Lake Syenite the two units are texturally similar and the contact appears to be gradational over a few metres rather than intrusive. The presence of interstitial quartz is the main distinguishing feature although the granite is also pinker in colour and less readily weathered than the syenite. Because of their textural similarity and gradational contact relations, Davidson suggested that both rock types are derived from the same magma.

The Thor Lake Syenite is completely enclosed by the Grace Lake Granite. It has been divided into five subunits, four of which are amphibole (ferrorichterite) syenites that differ mainly in texture. The fifth and most distinctive subunit is a narrow arc of fayalite-pyroxene mafic syenite, which is locally steeply dipping and lies close to the margin of the main amphibole syenite and the Grace Lake Granite. It forms a distinct semi-circular ridge, locally termed the rim syenite that can be traced for a distance of about 8 km and is thought to be a ring dyke.

7.3 LAKE ZONE GEOLOGY

The Lake Zone is the largest mineralized zone on the property. It subcrops over an area of about two square kilometres and from diamond drilling is upwards of 200 m in thickness, is subhorizontally disposed and remains open to at least the south and west (see Figure 7.1).

Figure 7.1 Elevation in Metres to Top of Basal Zone



Note: Meters are elevations above sea level not depth down from surface.

The geology of the Lake Zone is complex. Within the Avalon Lease area, the geology is dominated by a succession of syenites (Thor Lake syenite) which has evolved into a granitic counterpart (Grace Lake granite). Together, these two phases form the eastern part of the Blachford Lake Intrusive Suite of Davidson (1978).

The Thor Lake syenite consists of a lower series of cumulate rocks which pass upwards into porphyritic, mafic, laminated, and pegmatitic counterparts. In outcrop, Thor Lake syenite is seen to transition to Grace Lake granite with the appearance of quartz in an otherwise feldspathic rock. A breakdown of these rock types is provided in Table 7.1.

Table 7.1 Table of Lake Zone Rock Types

Type No.	Type Name	
1	**Grace Lake Granite**	
2	**Thor Lake Syenite**	
	Unaltered Series	*Altered Series*
	a) Riebeckite-Arfvedsonite Syenite	a) Pegmatite Syenite
	b) Augite Syenite	a) Albitite and Albitized Syenite
	c) Pegmatite	b) Chlorite-Biotite alteration
3	**Peralkaline Syenite**	
	Decreasing Alteration at Depths	
	a) Aegerine Nepheline Syenite	
	b) Sodalite Series	
	c) Cumulate Syenites	
	d) Layered Syenites	

The primary igneous rocks noted above have been subject to pervasive hydrothermal and metasomatic activity which replaces in part, or in whole, both Thor Lake syenite and Grace Lake granite. The metasomatism has resulted in new assemblages of biotite, magnetite, specularite, albite and chlorite, which in turn host the rare metals and rare earth elements that form the basis of the present resource estimates. The last events in the metasomatic sequence include alkali metasomatism, iron oxide metasomatism and minor silicification.

There is indication that the early formed rocks suffered some displacement through sedimentary processes, magmatic currents, and possibly foundering during cooling which makes geologic correlation difficult from section to section. The metasomatic rocks generally show a good chemical-stratigraphical correlation from section to section and they may reflect a Pressure/Temperature, or chemical disequilibrium boundary.

The original protolith of the Lake Zone appears to have been Thor Lake Syenite and it appears from limited paragenetic analysis to have suffered successive periods of metasomatism and re-equilibration. It can be divided into several rock types based on constituent lithology, primary textural preservation and degree of alteration. It is difficult to correlate lithologic units from drill hole to drill hole due to intense and often episodic phases of metasomatism which commonly obscure original protoliths. Correlations of rock types in the Lake Zone are made further difficult because of north-easterly trending faults running through the deposit and coincidentally, a number of Hearne diabase dykes which are parallel to or occupying these faults. This is also the direction of the regional schistosity where developed.

REE, Ta, Nb, and Zr mineralization in the Lake Zone occurs in broad enriched sub-horizontal replacement zones, in addition to being widely disseminated over much of the deposit. Potential ore minerals consist primarily of fergusonite, ferro-columbite, allanite and zircon. Minor or accessory assemblages include bastnaesite group minerals, monazite, and apatite. The highest grades of HREEs, LREEs, niobium, and tantalum appear to occur in magnetite and zircon-rich areas within the sub-horizontal replacement zones.

7.4 MINERALOGY OF THE LAKE ZONE

To date, some 83 mineral species have been recognized at Thor Lake. Several remain unidentified and may represent new mineral species. Table 7.2 lists the minerals of principal interest in the Lake Zone with the elements or metals.

Thirteen mineralogical studies have described the above mineralogy, in whole or in part, and the reader is referred to the tabulated references accompanying this document for further detail.

Table 7.2 Mineral of Principal Economic Interest in the Lake Zone

Element	Lake Zone
Y+HREE	fergusonite, zircon
Ta	fergusonite, columbite
LREE	allanite, monazite, bastnaesite, synchisite, parisite
Nb	columbite, fergusonite
Zr	zircon
Ga	albite (var. cleavelandite), biotite

Alkaline systems and their derived late magmatic phases usually exhibit little or no fractionation (Cerny, 1991). Accordingly, the compositions of constituent rare earth minerals in such deposits remain essentially constant. This became evident to Highwood personnel in the course of drilling of the T Zone, at which time it was found that lanthanum, cerium and neodymium maintained fixed ratios, an experience also encountered by Highwood geologists in their sampling of the Ilimausaq, Greenland, rare earth-bearing karkortokites and lujavarites over kilometre distances. Previously, then, in routine assaying therefore, only one of the above elements was tested. However, detailed REE analyses in the Lake Zone at Thor Lake have shown a contrasting pattern to the supposed consistent REE patterns. In fact, the proportion of heavy rare earths (HREE) to total rare earths (TREE) in the rock varies between about 7% HREE to 50% HREE in individual 2 m drill core samples. In addition, there is a fairly consistent pattern of changing rare earth proportions from bottom to top of the mineralized system, such that the relative amount of heavy rare earths decreases upwards and the basal part of the mineralization consistently has high HREE. This is in complete contrast to a system such as Molycorp's Mountain Pass, California rare earth deposit where the variation has been documented at 0.3% over a 50 year production history and routine assaying is not conducted until concentrates have been made. This changing rare earth pattern is a key to the value of the Lake Zone rock, in that, generally the heavy rare earths have higher unit value and so the basal parts of the Lake Zone alteration system have higher gross value per kilogram of contained rare earths than do the upper parts.

8.0 DEPOSIT TYPE

The mineral deposits at Thor Lake bear many of the attributes of an apogranite (Beus, et al., 1962) originating in an apical or domal facies of their parental syenite and granite.

According to Richardson and Birkett (1996), other comparable rare metal deposits associated with peralkaline rocks include:

- Strange Lake, Canada (Zr, Y, Be, Nb, REE).
- Mann, Canada (Be, Nb).
- Illimausaq, Greenland (Zr, Y, REE, Nb, U, Be).
- Motzfeldt, Greenland (Nb, Ta, Zr).
- Lovozero, Russia (Nb, Zr, Ta, REE).
- Brockman, Australia (Zr, Y, Nb, Ta).

Richardson and Birkett further comment that some of the characteristics of this type of deposit are:

- Mineralizing processes are associated with generally specific phases of multiple-intrusion complexes.
- Elements of economic interest include Ta, Zr, Nb, Be, U, Th, REE, and Y; commonly with more than one of these elements in a deposit. Volatiles such as fluorine and carbon dioxide (CO_2) are usually elevated.
- End members may be magmatic or metasomatic, but deposits may show influences of both. Alteration in magmatic types is often deuteric and local, while alteration in metasomatic types can be extensive.
- This type of deposit is usually large, but of low grade. Grades of Nb, Ta, Be, Y and REE are usually less than 1%, while the grade of zircon is typically from 1% to 5%.
- There are usually a variety of rare metal minerals in this type of deposit, including oxides, silicates, calcium phosphates and calcium fluorocarbonates. Nb and Ta mineralization is typically carried in pyrochlore and less commonly in columbite.

The preferred genetic model is that of igneous differentiation in closed-system conditions, with the rare earth metals concentrating in residual magma, aided by depression of the freezing temperature of the magma by fluorine and possibly CO_2.

9.0 MINERALIZATION

9.1 LAKE ZONE

The Lake Zone consists principally of two lithologies: Thor Lake Syenite (ferrorichterite-riebeckite syenite) and a lower aegirine nepheline syenite, both of which are overprinted by repeated metasomatic events. The degree and type of metasomatic overprinting on these protoliths determines subsequent lithologic classification. Original protolith textures are locally preserved to varying degrees, but are commonly completely obliterated by metasomatic processes, particularly Na (albitization, feldspathization), and Fe+Zr+F (magnetite, hematite, biotite, zircon)

Mineralization in the Lake Zone includes LREE found principally in allanite, monazite, bastnaesite and synchysite; yttrium, HREE and tantalum found in fergusonite; niobium in ferro-columbite; HREE and zirconium in zircon; and gallium in albitized feldspathic rocks. Several of the economically interesting minerals in the Lake Zone are found to be fine grained and form intimate admixtures which have in the past presented metallurgical difficulties.

The part of the Lake Zone alteration system that is enriched in REE varies between 80 m (L08-65) and 190 m (L08-127) in vertical thickness, with the alteration usually starting from the surface. The whole alteration system is enriched to varying degrees in rare earth elements, Zr, Nb and Ta, relative to unaltered syenite, with average values over the whole alteration package of approximately 0.75% to 1.0% TREO.

Within this alteration envelope, there are sub-horizontal zones of increased alteration accompanied by increased REE enrichment alternating with less enriched REE zones. Within the more intensely altered zones, the effect is that the original textures and mineralogy of the host rock is no longer apparent.

These zones of increased alteration, which can vary in thickness from a few metres to tens of metres, can frequently contain TREO grades in the range of 2% and higher. The lowermost band, referred to here as the Basal Zone, contains the highest proportion of HREO. Overall, the HREO proportion of the TREO within the 80 m to 190 m thick alteration system is typically between 7% and 15%. However, within the Basal Zone, this proportion can exceed 30%.

10.0 EXPLORATION

The Thor Lake Property has been systematically explored for several different metals over a period of 30 years (see History, Section 6.0). Exploration focus has shifted as new discoveries, such as beryllium, were made, or in response to price increases for tantalum, yttrium and HREE, or for example, because of improved methods of recovery of tantalum.

Since taking over the property in 2005, Avalon sampled archived drill cores from the Lake Zone to extend areas of known yttrium and HREEs. This was followed by the completion of a technical report on the Thor Lake property in 2007. Diamond drilling from the summer of 2007 through to the fall of 2008 totalled 85 new drill holes over much of the Lake Zone. Eleven of these holes were drilled from one set-up to acquire material for a mini-bulk sample for metallurgical bench scale test work.

11.0 DRILLING

Since 1977, diamond drilling has been carried out intermittently by various operators over five separate mineralized zones at Thor Lake. A total of 51 holes (5,648 m) had been completed on the Lake Zone through to 1988 (see History section).

Avalon commenced diamond drilling in the Lake Zone in July 2007, completing 85 holes totalling 16,840 m (see Appendix A). Drilling was organized into three separate drill programs:

July to October 2007	13 holes totalling 2,550 m (BTW diameter)
January to May 2008	45 holes totalling 8,725 m, including 11 metallurgical holes totalling 2,278 m (NQ2 diameter)
June to September 2008	27 holes totalling 5,565 m (NQ2 diameter)

The goal of the drilling was to continue to delineate zones of REE and Ta mineralization. This drilling was completed at a spacing of approximately 150 m by 150 m. Eleven tightly-spaced inclined holes (L08-099 to L08-109) were drilled to obtain a mini-bulk sample for continued metallurgical work on REE-enriched zones. Six of the earlier holes were also re-assayed to test for the full suite of Rare Earth elements as was done on the recent drilling.

Core from both historic drilling and current drilling is stored at Thor Lake. Archived core has been re-boxed where necessary, with all old core racks having been replaced with new ones.

12.0 SAMPLING METHOD AND APPROACH

12.1 SAMPLE INTERVAL

The normal sample interval for the Lake Zone drill core is 2 m, and is not necessarily tied to geological boundaries, since there is a lack of discrete contacts. The geologist marked the core for splitting both at the ends of the sample interval and also along the length of the core, indicating the splitting location, using chalk or timber pencil. A hand splitter was utilized and then executed by the core technician.

Drill logging initially used Excel spreadsheets to record sample intervals, geology, magnetic susceptibility, density and other parameters. During 2008 this was changed to an Access database. This database enables easier quality control of data entry and transition into modelling software.

Core obtained in the 2007-2008 drilling campaign was routinely tested for specific gravity using the water displacement method. All core was also measured for RQD. A handheld Niton XRF analyzer was used to get an indication for the potential REE elemental concentrations in the core.

Avalon commissioned CND Laboratory in British Columbia to generate three standards, AVL-H, AVL-M or AVL-L to be inserted into the assay stream. Avalon then retained Dr. Barry Smee to review and assess the results of a round robin analysis. The certification data and certificates generated by Dr. Smee for these standards can be found in Appendix B. A total of 67 blanks and 304 standards were tested at a frequency of approximately 1:22 (4.5%).

Any assay results obtained prior to 2007 (holes 1 to 51) are referred to as the older holes. These did not have internal Quality Assurance/Quality Control (QA/QC); however, six of the old holes were re-assayed in 2008 for the larger suite of elements.

New holes have internal standards, duplicates and blanks added for QA/QC. Initially, in 2007, the blank material comprised pulverized handpicked pure quartz fragments collected from the dumps at the T Zone. Later, in 2008, this was changed to utilization of diabase dyke drill core from the Lake Zone drilling to better simulate the whole sample preparation sequence. The diabase core is effectively low enough in REE to detect any gross contamination or sample switching that may take place.

Samples followed a chain of custody and were shipped to be prepared at the ACME Laboratories' facility in Yellowknife. Duplicate pulps were sent to two check labs: Activation Laboratories Ltd. (Actlabs) and ALS Chemex (ALS).

In general, the core had nearly 99% recovery. Some minor areas of broken core existed, but were extremely minimal. The drilling standard was BQ thin wall (BTW) in the 2007 drill program, resulting in core slightly smaller than normal NQ. The 2008 program utilized NQ core.

Core units had variations of pinks, greens and greys. It was difficult to observe the contacts for either lithologic changes or grade variations. The deepest hole is in the 250 m range.

Holes were generally vertical and each was checked with an acid test at the bottom of the hole (no variations from the vertical were recorded to date within the reading accuracy of acid tests). Angle holes as measured by acid tests show a maximum deviation of 3 degrees in dip (DH L08-093).

The metallurgical drill holes (DH L08-99 to 109) were surveyed with a downhole Flexit system and the results indicated:

1. Dip deviations were usually less than 1°, except for one hole (L08-105) where it was just under 2°.

2. Azimuth deviations ranged between 3° and 9°, and were usually to the right of the hole direction.

Most collars for drilling since 2007 have been surveyed. Historic holes were also generally surveyed and survey records have been preserved in project files. Blocks in the core boxes are marked off in both feet and metres by the drillers (using a conversion calculator). Drill rods are imperial. Technicians measure core between blocks to confirm recovery and any footage errors.

Core was stored on site, including all of the old core in racks. The old core boxes were in deteriorating condition, but markings were still recognizable (although not on all boxes), though the footage blocks are unreadable. The boxes had metal tags on most boxes. Some of the old boxes had the bottoms coming apart; some holes had all core removed for analysis. Most of the old core was BQ, but there is some larger diameter (HQ) core in a few holes. The 1978 series boxes do not appear to be in good shape, but these holes have been catalogued in 2008. The old ore was also hand split. New core racks have been built and the old core has been completely re-boxed. In some cases all the old core has been removed for metallurgical testing.

After the new core is hand split, the sample tags are left in the boxes. Core is broken down manually so that it will fit into splitter. The core splitter trays collect the split samples and chips, with the trays cleaned between sample splits.

12.1.1 CHAIN OF CUSTODY

The geologist measured sample intervals, and the technician sampled the core using a hand splitter and placed half of the sample in bags, stapled the bag shut and numbered the bag with the sample number, placed it into a rice bag with the sample number ranges listed on the outside. Rice bags were tied with plastic cable ties. Each bag had a unique shipping number. Bags were placed outside ready for the plane and were then sent to ACME Laboratory in Yellowknife for preparation. A double check of the number of bags and contained sample numbers was made. Discovery Mining Services collated the samples shipped and faxed the list to the Avalon head office. Discovery then delivered the samples to Acme Laboratory. The lab knew the number of bags shipped, but they did not inform the field site. A cross check of samples submitted was completed via the drill hole Access database.

13.0 SAMPLE PREPARATION, ANALYSES, AND SECURITY

13.1 SAMPLE PREPARATION

Core is sent to the preparation laboratory with specification that all core should be crushed to 90% passing 10 mesh with a supplementary charge if necessary.

Two 250 g pulps are prepared from each sample, one for the primary laboratory, and one to be shipped to Avalon and used for the check analysis.

For the moment all rejects are stored by the preparation laboratory.

13.2 LABORATORY METHOD

The primary laboratory at present is Acme. All core is analysed using two analytical packages: Group 4A and Group 4B. Group 4A is a whole rock characterization package comprising four separate analytical tests. Total abundances of the major oxides and several minor elements are reported on a 0.1 g sample analysed by Inductively Coupled Plasma (ICP)-emission spectrometry following a lithium metaborate/tetraborate fusion and dilute nitric digestion. Loss on ignition (LOI) is by weight difference after ignition at 1,000°C.

Group 4B is a Total Trace Elements by ICP-MS. This package comprises two separate analyses. Rare earth and refractory elements are determined by ICP mass spectrometry following a lithium metaborate/tetraborate fusion and nitric acid digestion of a 0.1 g sample (same decomposition as Group 4A). In addition, a separate 0.5 g split is digested in Aqua Regia and analysed by ICP mass spectrometry to report the precious and base metals.

For the summer 2007 program, the secondary laboratory was Actlabs. A second pulp split supplied by Acme was shipped to Actlabs. Here the procedure (from the Actlabs brochure) is: Codes 4B, 4B2-STD, 4B2-RESEARCH, 4LITHO, 4LITHORESEARCH - Actlabs has developed a lithium metaborate/tetraborate fusion ICP Whole Rock Package Code 4B and a trace element ICP/MS package Code 4B2. The two packages are combined for Code 4Litho. The quality of whole rock data in Code 4B meets or exceeds quality of data by fusion XRF Code 4C, the old standard in whole rock analysis. The fusion process ensures total metals particularly for elements like REE in resistate phases. (This may not be the case for acid digestions, particularly for heavy rare earths and other elements contained in refractory minerals like zircon, sphene, monazite, chromite, gahnite and several other phases. If refractory minerals are not digested, a bias may occur for certain REE and HFSE with acid digestions). The trace element package by ICP/MS, Codes 4B2-STD or 4B2-RESEARCH, on the fusion solution provides research quality data whether using standard or research detection limits. Eu determinations are semi-quantitative in samples having extremely high Ba concentrations (greater than 1%). This package is intended primarily for unmineralized samples. Mineralized samples can be analyzed, however, data may be semi-quantitative for chalcophile elements (Ag, As, Bi, Co, Cu, Mo, Ni, Pb, Sb, Sn, W and Zn).

For the January to May 2008 drilling campaign, secondary samples, comprising roughly every tenth pulp sample supplied by Acme, are being shipped to ALS Laboratories, where the samples are analysed by the package termed “Complete characterization – Lithogeochemistry”, which is a combination of lithium metaborate/ICP-AES for whole rock, lithium borate/ICP-MS for refractory and other elements and aqua regia/ICP-MS for volatile elements. See Appendix H for a detailed comparison of each element for the Acme original assay results with the ALS duplicates.

14.0 DATA VERIFICATION

Wardrop carried out an internal validation of the available assay data on six (5.5%) of the 58 original drill holes (#52-109) in the database prior to the commencement of work on the resource. In December 2008, Avalon added 27 new drill holes(#110-136) and 6 older holes to the database. A minimum of 5% of these data points were verified prior to inclusion into the resource model. For the recent holes (#52-136), the database was compared against the original assay certificates and for the older holes(#1-51) the database was checked against values recorded on the original drill logs. In total, 373 samples were checked (6.19% of the dataset).

Holes drilled prior to 2007 (#1-51) are referred to as the “older holes”. They were verified by Wardrop as part of the 2006/2007 mineral resource estimate. The older holes were not subjected to an internal QA/QC program. The six older holes that were re-assayed in 2008 for the entire suite of Rare Earth elements were subjected to the same QA/QC program described below.

Data verification was completed on a total of 64 randomly selected values in each hole. The values represent the following elements or compounds: SiO_2, Al_2O_3, Fe_2O_3, MgO, CaO, Na_2O, K_2O, TiO_2, P_2O_5, MnO, Cr_2O_3, Ni_1, Sc, LOI, Sum, Ba, Be, Co, Cs, Ga, Hf, Nb, Rb, Sn, Sr, Ta, Th, U, V, W, Zr, Y, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Mo, Cu, Pb, Zn, Ni_2, As, Cd, Sb, Bi, Ag, Au, Hg, Tl, Se, Y_2O_3, Ce_2O_3, Ta_2O_5, and Nb_2O_5 values. Initially, all the samples in the selected drill holes were checked, but this was ultimately reduced to 10% due to time constraints and the paucity of errors found.

Only minor discrepancies were found and seem to be related to the recording of sub detection limit values in historic drill holes. It should be noted that none of these errors were in the recent holes on which this resource estimation is based. Details of the verification are listed in Table 14.1.

Table 14.1 Validation of the Digital Database to Original Logs

Hole-ID	Total Records	Error Records	% of Records with Errors	Notes
79-01	3	0	0.00%	Ta2O5 values absent. Probably an assay summary.
85L-06	130	8	6.15%	"0" entered instead of "<0.001" for below detection.
L07-058	84	0	0.00%	Complete check done.
L07-064	77	0	0.00%	Complete check done.
L08-069	13	0	0.00%	10% check done.
L08-087	66	0	0.00%	10% check from Sample #795559 Tb value done.
Total	373	8	2.15%	

Upon receipt of the final assay results (1,061 samples) for holes 52-109, 5% (54) of these samples were checked against the assay certificates. The only discrepancies found were due to rounding differences in the decimal places for a few elements. Similarly, a 5% check was done on assays for drill holes 110-136 and no errors were found.

For the 2007-2008 drill program, drill hole collars were checked using a portable GPS unit. A number of holes were drilled on top of the lake ice, and the collar coordinates were checked against those actually surveyed. Except for the dip of the holes, the collar coordinates compared very well. Wardrop assumes that the dip of the holes was accurately measured by the site surveyors. For most drill holes, down-hole surveys were done with acid tube etches and showed no material deviations. Holes were relatively shallow (up to 650 feet), resulting in good control of hole deviation. The metallurgical holes (99-109) as noted above were surveyed with a Flexit downhole system.

14.1 Quality Assurance/Quality Control

Avalon commissioned CDN Laboratory in British Columbia to generate three standards, AVL-H, AVL-M or AVL-L to be inserted into the assay stream. Avalon then commissioned Dr. Barry Smee to review the round robin and assess the quality of the data. The certification data and certificates for these standards can be found in Appendix B. A total of 67 blanks and 304 standards were tested at a frequency of approximately 1:22 (4.5%).

A total of 378 QA/QC samples are found in the assay database pertaining to diamond drill holes L07-052 to L08-136. Forty-five of the standards were labelled "Unknown" in the database. An examination of the assay results indicates that two samples labelled BLANK are actually standards and that two of the other standards had been mislabelled. Furthermore, it was possible to determine the names of the

"Unknown" standards by the combination of element concentrations which is unique to each standard. In the end, only seven of the standard analyses remain of unknown origin. These are likely data entry errors, core samples incorrectly entered into the database as standards or possibly laboratory sample switching. Table 14.2 is a summary before and after re-labelling.

Table 14.2 Summary of Re-Labelled Standard Names

Name	Original	Corrected
STD-H	86	88
STD-M	89	118
STD-L	91	98
STD-BLK	67	67
STD-UNKN	45	7
Total	**378**	**378**

The results of the standard analyses were checked against the certified or provisional mean and tolerance listed in the standard certificates. Twenty one elements were reviewed and the results are summarized, below, in Table 14.3. The detailed results for each element and standard are found in Appendix C.

The results of the QA/QC program are generally quite noisy and show a negative bias for 13 of the 15 Rare Earth Elements in the Lake Zone. The average bias on the entire suite of REEs relative to their certified means is -5% to -6% . In some cases, the mean of the routine standard results falls outside of the ±2 standard deviation tolerance generally considered acceptable. Specifically, Ce consistently shows values greater than 2 SD from and below the recommended value and Y, though within 2 SD for two out of three standards, shows an average 13% lower for all three standards. In other cases, the lab results seem within tolerances for a period and then move out of tolerance. .

As part of the QA/QC program, Avalon employed two check labs to which duplicate pulps were sent to confirm the primary labs accuracy. From this program, 1159 pulps were sent to Actlabs in Ontario and 601 were sent to ALS-Chemex in Vancouver. Of the 1159 pulps sent to Actlabs, 45 were Avalon Standards and 15 compared so poorly to the original sample result that an error was suspected. This resulted in 1099 paired Acme and Actlab analyses. Of the 601 pulps sent to ALS, 42 were Avalon standards and 13 compared so poorly to the original sample result that an error was suspected. This resulted in 546 paired Acme and ALS analyses.

As shown in Table 14.3, Acme labs analyses were consistently lower than both of the two check labs for almost all of the Rare Earth Elements. Details of the duplicate sample results and an analysis thereof can be found in Appendix C.

Table 14.3 Relative Differences of Analyses between Acme Labs and the Check Labs

REE	Acme vs. Actlabs Relative Difference	Acme vs. ALS Relative Difference
Y	-14.68%	-4.09%
La	-6.31%	-11.30%
Ce	-6.18%	-9.63%
Pr	2.65%	-7.80%
Nd	7.58%	-2.80%
Sm	-4.42%	-9.89%
Eu	-7.22%	-4.42%
Gd	-19.41%	-14.22%
Tb	-3.96%	-17.14%
Dy	-2.96%	-5.64%
Ho	-2.54%	-9.93%
Er	-14.92%	-24.43%
Tm	-4.33%	-1.56%
Yb	-2.22%	-5.16%
Lu	5.21%	-3.59%
Mean	**-4.91%**	**-8.77%**
Pairs	**1,099**	**546**

In conclusion, based on the analysis of the standard analysis results and the pulp duplicate results for the Lake Zone project, it would appear that the Rare Earth lab analyses are biased low by more than 5%. From the data reviewed by Wardrop, it would appear that this situation has existed throughout the 2007/08 program. It is therefore possible that the actual grade of the deposit could be more than 5% higher than the current data would indicate.

The potential of a negative bias in the Rare Earth Analyses from Acme requires immediate attention and should be discussed with lab personnel (if Avalon has not already done so). It is also recommended that the certification data for the three Avalon standards be re-examined and possibly supplemented with analyses from additional laboratories.

14.2 Specific Gravity Data Verification

Avalon checked 32 Specific Gravity (SG) determinations by sending the core samples to ALS Chemex for verification. ALS ran two sets of measurements on the core: one with core samples coated in paraffin and one without paraffin. The two sets of measurements were almost identical with a correlation coefficient of 0.9929. When the ALS water immersion results (without paraffin) were compared to the results measured by Avalon, the two sets of data were very similar with a correlation coefficient of 0.9961. It can be concluded that the water immersion density data produced by Avalon is reliable and suitable for use in resource estimation.

Table 14.4 Mean Standard Results vs. Certified Means and Tolerances

AVL-H	Y	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
Certified Mean	2,739	2,568	6,189	768	3,038	589	72.8	586	106	569	100	233	27.4	143	17.7
Mean of Analyses	2,315	2,437	5,665	722	2,903	555	69.3	567	96	551	100	223	27.6	139	17.9
Difference	-424	-131	-524	-46	-135	-34	-3.5	-19	-10	-18	0	-10	0.2	-4	0.2
Relative Difference	*-15%*	*-5%*	*-8%*	*-6%*	*-4%*	*-6%*	*-5%*	*-3%*	*-9%*	*-3%*	*0%*	*-4%*	*1%*	*-3%*	*1%*
Tolerance 2SD (+/-)	163	261	616	53	208	59	6.1	67	10.4	38	9.6	26.6	1.4	6.3	1.1
3SD (+/-)	244.5	391.5	924	79.5	312	88.5	9.15	100.5	15.6	57	14.4	39.9	2.1	9.45	1.65
Number of Analyses	88														
AVL-M	**Y**	**La**	**Ce**	**Pr**	**Nd**	**Sm**	**Eu**	**Gd**	**Tb**	**Dy**	**Ho**	**Er**	**Tm**	**Yb**	**Lu**
Certified Mean	918	1,735	3,859	491	1,858	354	40	315	43.1	203	35.8	79.5	10.0	59.3	8.0
Mean of Analyses	816	1,617	3,533	464	1,821	326	38	277	38.3	194	32.8	74.2	9.9	56.5	8.0
Difference	-102	-118	-326	-27	-37	-28	-1.7	-38	-5	-9	-3	-5	-0.1	-3	0.0
Relative Difference	*-11%*	*-7%*	*-8%*	*-5%*	*-2%*	*-8%*	*-4%*	*-12%*	*-11%*	*-4%*	*-8%*	*-7%*	*-1%*	*-5%*	*0%*
Tolerance 2SD (+/-)	136	107	131	29	115	41	3.5	47	2.2	21	2.2	11.8	1.1	4.4	0.7
3SD (+/-)	204	160.5	196.5	43.5	172.5	61.5	5.25	70.5	3.3	31.5	3.3	17.7	1.65	6.6	1.05
Number of Analyses	118														
AVL-L	**Y**	**La**	**Ce**	**Pr**	**Nd**	**Sm**	**Eu**	**Gd**	**Tb**	**Dy**	**Ho**	**Er**	**Tm**	**Yb**	**Lu**
Certified Mean	641	1,020	2,309	299	1,140	230	25.7	200	28.5	138	24.3	55.6	7.07	41.6	5.5
Mean of Analyses	556	960	2,091	277	1,098	202	24.1	181	25.3	130	22.2	52.0	7.0	40.0	5.5
Difference	-85	-60	-218	-22	-42	-28	-1.6	-19	-3	-8	-2	-4	0.0	-2	0.0
Relative Difference	*-13%*	*-6%*	*-9%*	*-8%*	*-4%*	*-12%*	*-6%*	*-10%*	*-11%*	*-6%*	*-8%*	*-7%*	*0%*	*-4%*	*0%*
Tolerance 2SD (+/-)	84	95	183	16.5	52	26	3.2	21.7	2.4	14	3.1	8.1	0.5	2.4	0.34
3SD (+/-)	126	142.5	274.5	24.75	78	39	4.8	32.55	3.6	21	4.65	12.15	0.75	3.6	0.51
Number of Analyses	98														
Average Bias	***-13%***	***-6%***	***-9%***	***-6%***	***-3%***	***-9%***	***-5%***	***-8%***	***-10%***	***-4%***	***-6%***	***-6%***	***0%***	***-4%***	***0%***

15.0 ADJACENT PROPERTIES

At the time of writing, there are no mineral claims or leases adjacent to the Thor Lake leases. All of the known rare metal deposits related to the Blatchford Lake Complex are owned by Avalon.

16.0 MINERAL PROCESSING AND METALLURGICAL TESTING

16.1 INTRODUCTION

Between 1984 and 1989, considerable test work was done on the North T Zone samples by Witteck, Lakefield, and Hazen which culminated in pilot plant testing programs at Lakefield. This work has been summarized by Currie (2004) and reviewed in the Wardrop PEA of 2007 to which the reader is referred.

Metallurgical difficulties in the processing of Lake Zone mineralization were first noted by TANCO and subsequently Placer and over a period of about 6 years Highwood retained a number of consultants to develop satisfactory processes for the recovery of tantalum from the Lake Zone. These studies, predicated on the assumption of tantalum being hosted in the mineral specie columbo-tantalite, were unsuccessful. In 2001 Lakefield Research succeeded in producing a bulk concentrate of the various metals in the Lake Zone. This work is described below and formed the basis of the process cost estimates in the Wardrop 2007 study.

16.2 LAKE ZONE METALLURGICAL TESTING

In 2001 Lakefield, at the request of Navigator, carried out a testing program on a composite drill core sample from the Lake Zone. The composite used in the study assayed 0.56% Nb_2O_5, 0.047% Ta_2O_2, 5.2% ZrO_2, 0.12% Y_2O_3, and 1.55% TREO. Lakefield's mandate was to produce a tantalum concentrate.

The tantalum could not be recovered to a marketable specification; however a flotation process was developed in the course of the work that produced a bulk tantalum-niobium-zirconium-yttrium-REE concentrate.

Figure 16.1 shows the grinding and de-sliming flowsheet used in processing the composite sample and Figure 16.2 shows the flotation circuit developed to produce the bulk concentrate.

The metallurgical results obtained in a locked cycle test are shown in Table 16.1 and analytical results of the bulk concentrate are given in Table 16.2.

Figure 16.1 Grinding and De-Sliming Flowsheet, Lake Zone

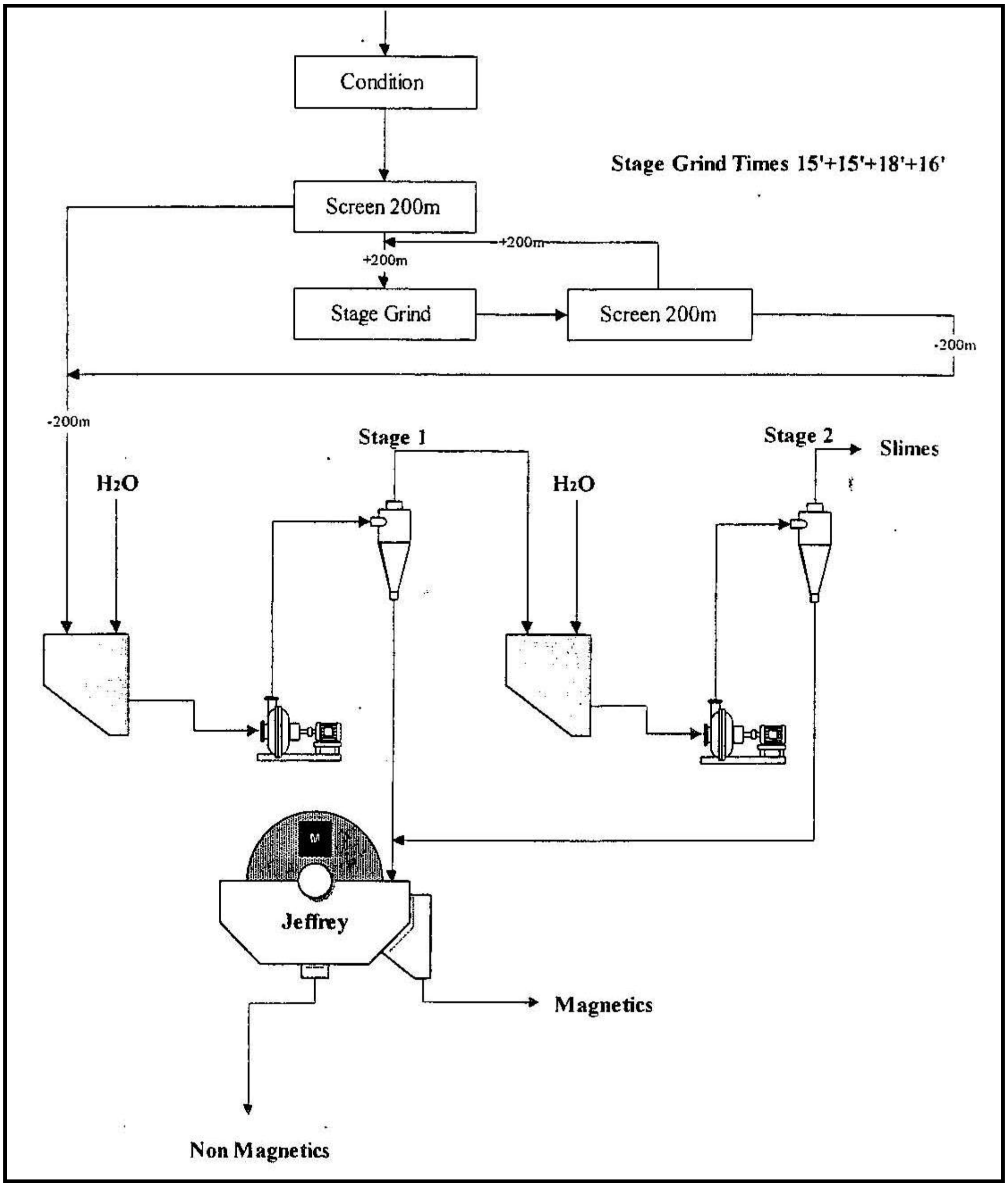


Figure 16.2 Flotation Flowsheet, Lake Zone Bulk Concentrate

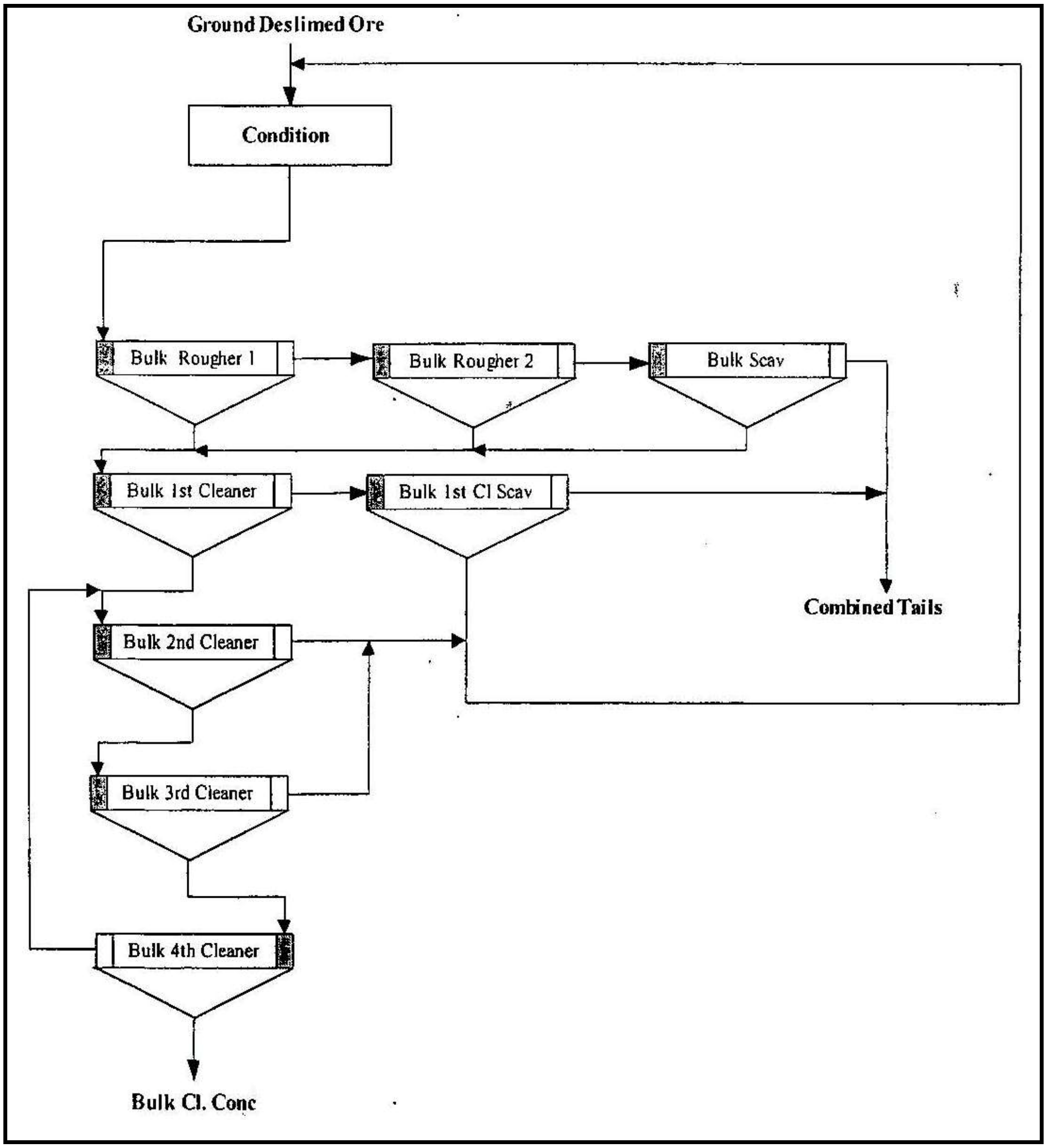


Table 16.1 Metallurgical Results Obtained in the Locked Cycle Test

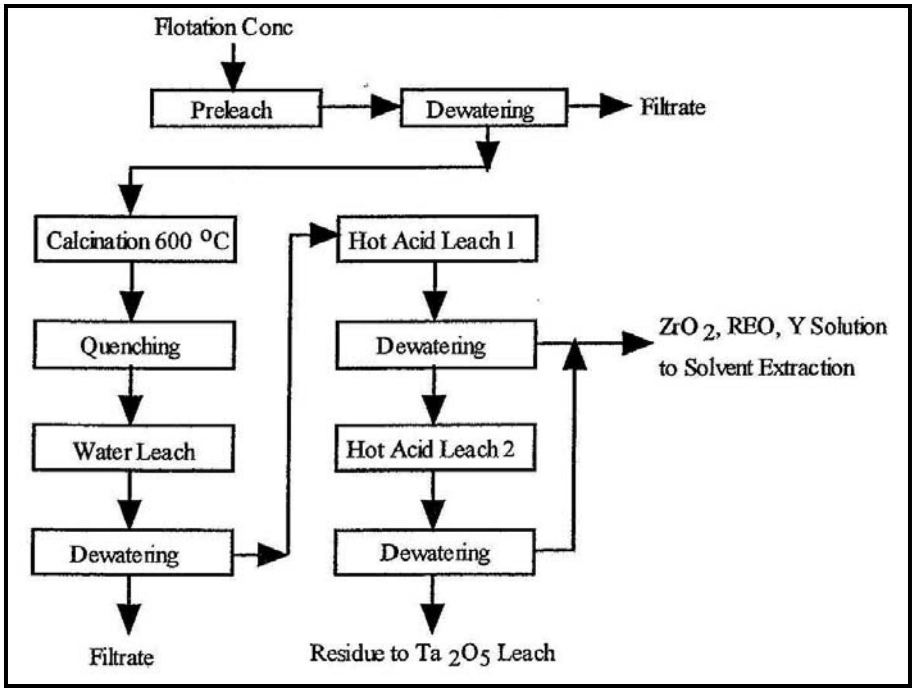
Product	Wt	Assay (%)					Recovery (%)				
	(%)	ZrO_2	Ta_2O_5	Nb_2O_5	TREO	Y_2O_3	ZrO_2	Ta_2O_5	Nb_2O_5	TREO	Y_2O_3
Bulk Cl Conc.	19.70	21.4	0.27	2.01	7.10	0.50	82.8	74.8	65.2	90.2	82.0
Combined Tails	72.50	0.99	0.02	0.23			14.0	20.1	28.8		
Magnetics	2.41	2.02	0.039	0.37			1.0	1.3	1.6		
Slimes	5.31	2.11	0.05	0.48			2.2	3.7	4.4		
Head Calc	99.92	5.02	0.07	0.59			100.0	100.0	100.0		
Head Direct		5.20	0.047	0.56	1.55	0.12					

Table 16.2 Analysis of Lake Zone Bulk Concentrate

Element (%)	Assays
ZrO_2	20.5
Ta_2O_5	0.25
Nb_2O_5	2.10
Y_2O_3	0.50
Ce_2O_3	3.35
La_2O_3	1.51
REO	7.10
ThO_2	0.048
U_3O_8	0.012

Preliminary hydrometallurgical testing, preparatory to solvent extraction processing, was carried out on the flotation concentrate. The tests included low temperature sodium hydroxide (NaOH) calcination followed by water and hot hydrochloric (HCl) acid leach (Figure 16.3). Test results indicated that ZrO_2, Y_2O_3 and REO can be dissolved leaving tantalum and niobium in a residue, all of which could be recovered using standard metallurgical techniques.

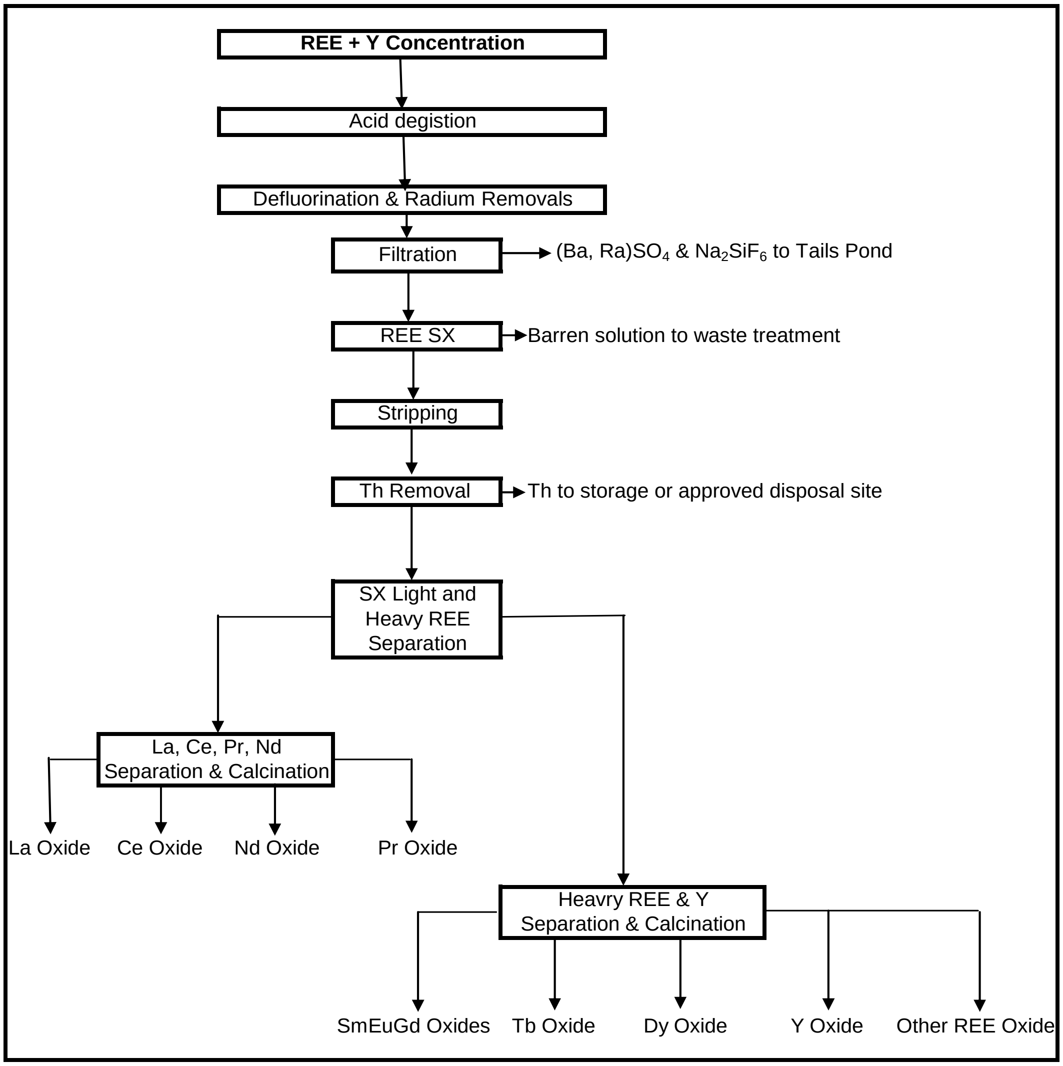
Figure 16.3 Generalized Leaching Flowsheet for Bulk Concentrate



16.3 SOLVENT EXTRACTION PROCESSING

Solvent extraction research was not conducted on the Lake Zone bulk concentrate. For the purposes of a preliminary process operating cost estimate for the Lake Zone ores of the Thor Lake deposits (Section 16.4), a proposed solvent extraction flowsheet was generated on the basis of existing plants for the recovery of Y+REEs and used for the basis of operating costs. The flowsheet is shown in Figure 16.4.

Figure 16.4 Conceptual Flowsheet for Y+REE Concentrate Processing



16.4 PRELIMINARY PROCESS OPERATING COST ESTIMATES

Preliminary process operating costs were estimated to facilitate the determination of a cut-off grade in order to define a potential economic resource.

The relationship (Table 16.3) between flotation feed grade and the concentrate grade as well as total rare earth recovery was generated by John Goode, P. Eng., based on recent flotation test results on the Thor Lake samples at SGS Lakefield.

Table 16.3 Concentrate Grade and TRO Recovery at Different Feed Grade Based on Current Metallurgy Test Program

Feed Grade TREO %	0.5		1.5		2		3	
Concentrate Grade TREO %	4.35		5.85		6.59		8.09	
Metal Recover TREO %	80	85	80	85	80	85	80	85
Concentrate Mass %	9.2	9.8	20.5	21.8	24.3	25.8	29.7	31.5

Since only preliminary leach tests have been conducted on the flotation concentrate from the Basal Zone ores and more tests are required to define the proper leach parameters of the rare earth concentrate, four leaching options were considered in the cost estimates. The Leach Option III, a caustic crack with 0.8 t of NaOH for each tonne of flotation concentrate and followed by acid leach with three tonnes of 37% HCl for dissolution of the rare earth elements, is considered the most probable case.

The recovery of the rare earth metals from leach solution and subsequent separation of the metals into separate rare earth oxide products through solvent extraction are based on the conceptual flowsheet shown in Figure 16.4. The reagent consumptions in the solvent extraction process are based on the industrial average.

The flotation reagent consumption is based on data obtained in a 2002 flotation test program conducted at SGS Lakefield. John Goode has confirmed that recent flotation tests at SGS Lakefield used similar reagent dosages.

Due to the current high volatility of reagent prices, in particular acid prices, the reagent prices used in the scoping study on the Thor Lake project conducted by Currie, P. Eng. (2002) were used in the present estimate and the final reagent cost was escalated to current year.

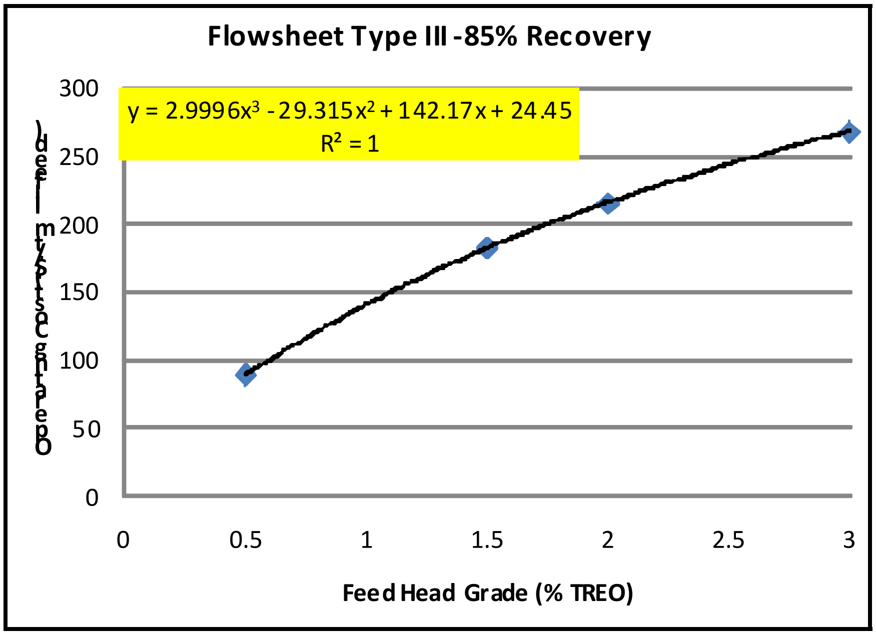
The process operating costs at a fixed rare earth oxide production rate (4,000 t/a) with differing head grades and the different process options are shown in Table 16.4.

Table 16.4 Process Operating Costs at Different Feed Grades through Different Process Options

Feed Grade TREO%		0.5		1.5		2		3	
Concentrate Grade TREO%		4.35		5.85		6.59		8.09	
Flotation Metal Recovery TREO%		80	85	80	85	80	85	80	85
Concentrate Mass%		9.2	9.8	20.5	21.8	24.3	25.8	29.7	31.5
Concentrate Tonnage at TREO Output of 4,000 tonnes		101,048	101,048	75,139	75,139	66,701	66,701	54,334	54,334
Mill Throughput Required (tonnes)		1,098,901	1,034,260	366,300	344,753	274,725	258,565	183,150	172,377
Process Option	**Process Description**	**Operating Cost (dollars/tonne mill feed)**							
Type I	H_2SO_4 Bake 1:1 acid addition	**Case 1**	**Case 2**	**Case 3**	**Case 4**	**Case 5**	**Case 6**	**Case 7**	**Case 8**
		60.70	63.39	119.32	125.67	141.28	149.01	176.89	186.84
Type II	Caustic Crack + HCl, 1:1 Caustic addition, 5.6 t of 37% HCl	**Case 9**	**Case 10**	**Case 11**	**Case 12**	**Case 13**	**Case 14**	**Case 15**	**Case 16**
		115.80	121.93	242.22	256.26	286.76	303.58	354.64	375.70
Type III	Caustic Crack + HCl, 0.8:1 Caustic addition, 3 t of 37% HCl	**Case 17**	**Case 18**	**Case 19**	**Case 20**	**Case 21**	**Case 22**	**Case 23**	**Case 24**
		84.41	88.58	172.21	181.87	203.89	215.53	253.39	268.12
Type IV	Caustic Crack + H_2SO_4, 0.8:1 Caustic addition, 1.5 t of 100% H_2SO_4	**Case 25**	**Case 26**	**Case 27**	**Case 28**	**Case 29**	**Case 30**	**Case 31**	**Case 32**
		85.39	89.62	174.40	184.19	206.47	218.28	256.54	271.47

The results in Table 16.4 indicate that the operating costs range from CDN$61/t for low-grade mill feed to CDN$271/t for high-grade mill feed. A perfect correlation ($R^2 = 1$) can be established between the process operating costs and the mill feed head grade. Figure 16.5 illustrates the process operating costs versus the mill feed grade for Leach Option III at a flotation recovery of 85%.

Figure 16.5 Process Operating Cost vs. Mill Feed head Grade



The process operating cost can be calculated at any feed grade for each process option using the trend line equations. Table 16.5 shows the recoveries calculated using the trend line equations for the Leach Option III and TREE flotation recoveries of 80% and 85% respectively. Please see Appendix G or the details of process operating cost calculations and the trend line equations to calculate the cost at any given feed grade.

Table 16.5 Process Operating Costs at Different Head Grades for Leach Operation III

Process Option	Operating Cost Equation	Operating Costs at Different Head Grade ($/t mill feed)								
		1.5	**1.6**	**1.7**	**1.8**	**1.9**	**2**	**2.1**	**2.2**	**2.3**
Type III, Recovery 80%	2.8231X3-27.591X2+133.81X+24.051	172.21	179.08	185.66	191.98	198.05	203.89	209.52	214.95	220.21
Type III, Recovery 85%	2.9996X3-29.315X2+142.17X+24.45	181.87	189.16	196.16	202.87	209.32	215.53	221.51	227.28	232.86

17.0 MINERAL RESOURCE AND MINERAL RESERVE ESTIMATES

17.1 INTRODUCTION

The new resource estimate focuses on the Basal Zone which has produced the most attractive grades due to its enrichment in the more valuable heavy rare earths. The results are summarized in Table 17.1 at a TREO cut-off grade of 1.6%.

Table 17.1 Lake Zone Mineral Resource Summary

Zone	Resource Class	Cut-Off TREO (%)	Tonnes (x1000)	TREO (%)	HREO (%)	H/T (%)
Basal	Indicated	1.60	2,186	2.14	0.43	20.0
Upper	Indicated	1.60	1,873	1.96	0.19	9.7
Total	Indicated	1.60	4,059	2.06	0.32	15.5
Zone	**Resource Class**	**Cut-Off TREO (%)**	**Tonnes (x1000)**	**TREO (%)**	**HREO (%)**	**H/T (%)**
Basal	Inferred	1.60	28,447	1.99	0.44	22.1
Upper	Inferred	1.60	32,707	2.10	0.17	8.2
Total	Inferred	1.60	61,154	2.05	0.30	14.5

Notes:

1. HREO (Heavy Rare Earth Oxides) is the total concentration of: Y_2O_3, Eu_2O_3, Gd_2O_3, Tb_4O_7, Dy_2O_3, Ho_2O_3, Er_2O_3, Tm_2O_3, Yb_2O_3 and Lu_2O_3.
2. TREO (Total Rare Earth Oxides) is HREO plus: La_2O_3, Ce_2O_3, Pr_6O_{11}, Nd_2O_3 and Sm_2O_3
3. Wardrop considers a 1.60% TREO cut-off grade to be a reasonable estimate of potentially economic resources, based on a preliminary estimate of operating costs totalling $197.00/t.
4. To determine a recommended cut-off grade, Gross Metal Values (GMV) were calculated using four-year average REE prices (where available) and assuming recoveries of: 74.6% for Y_2O_3 and all rare earth elements. The metallurgical recoveries include both mineral processing (flotation) and hydrometallurgical recoveries.
5. H/T is the ratio of HREO to TREO expressed as percent.

17.2 DATA

The data used in the modelling of the Lake Zone Deposit consisted of 91 diamond drill holes totalling 17,533.6 m of core, 15,754.97 m of which were sampled. Only six older holes, totalling 833.8 m, have been carried over from the database used to generate the 2007 Mineral Resource Estimate. These holes were re-analysed to include the full suite of Rare Earth Elements. Eighty-five new holes totalling 16,840 m were used from the 2007 and 2008 drilling campaigns.

17.3 GEOLOGICAL INTERPRETATION

The 2007 and 2008 drilling of the Lake Zone discovered a zone at depth that is more enriched in Total Rare Earth than the areas tested in the past. This Basal Zone is also enriched in the more valuable Heavy Rare Earths. Seventy-four diamond drill holes intersected the Basal Zone which averaged 23 m in thickness.

The Basal Zone was modelled jointly by Avalon and Wardrop geologists as a flat, undulating layer confined by upper and lower contact surfaces. The lower Basal Zone contact surface follows the base of Rare Earth mineralization and alteration seen in the diamond drill holes. The lower contact is quite sharp and clear cut and for the purposes of grade estimation, the lower Basal Zone contact was considered to be a “hard” boundary.

The upper Basal Zone contact surface represents the top of the lowest enriched zone assaying greater than 1% TREO and 0.15% HREO. The determination of the exact location of the upper contact is often difficult because there are numerous zones of enrichment between the Basal Zone and surface, and the transition into what has been called the Upper Zone is gradational. For the purposes of grade estimation, the upper Basal Zone contact was considered to be a “soft” boundary. The interpreted intersection depths of the Basal Zone in the drill holes are found in Appendix D.

The Upper Zone is, for all intents and purposes, the portion of the Lake Zone deposit that was the subject of the Resource Estimate and Scoping Study completed by Wardrop in 2006 and 2007, respectively. Generally-speaking it is less enriched in Rare Earth Elements than the Basal Zone, particularly the Heavy Rare Earths. There are, however, irregular zones of altered intrusive that contain grades resembling those found in the Basal Zone. It was not possible to model these zones due to their lack of continuity between drill holes.

The Lake Zone deposit is cross-cut by a series of sub-vertical Diabase Dykes striking approximately 75°. The dykes are thought be parallel to and perhaps intruded along a regional fault system. Six large dykes have been interpreted from the drilling and surface mapping and are included in the Lake Zone Geological Model. Due to the fact that the vast majority of the widely-spaced drill holes are vertical, it was not possible to determine if the Basal Zone has been offset along the faults and dykes.

17.4 Exploratory Data Analysis

The statistics of the Lake Zone data are summarized by domain in Table 17.2.

17.4.1 Correlation Coefficients

The Rare Earth Elements in the Lake Zone show good correlation to one another. In particular, the Light Rare Earths (lanthanum, cerium, praseodymium, neodymium and samarium) are very strongly correlated as are the Heavy Rare Earths and yttrium. This can be seen in Table 17.3. The Light Rare Earth Oxide names are highlighted in green and the HREO names in blue.

17.4.2 Capping of High Grades

No capping of high grades was necessary.

17.4.3 Compositing Strategy

All assay data were composited to a 2.5 m composite length between domain boundaries. This resulted in the creation of 7,164 composites. Prior to compositing, all missing and unsampled intervals were assigned a value of zero.

Table 17.2 Lake Zone Samples – Summary Statistics

Upper	Length (m)	TREO (%)	HREO (%)	H/T (%)	Y_2O_3 (ppm)	La_2O_3 (ppm)	Ce_2O_3 (ppm)	Pr_2O_3 (ppm)	Nd_2O_3 (ppm)	Sm_2O_3 (ppm)	Eu_2O_3 (ppm)	Gd_2O_3 (ppm)	Tb_2O_3 (ppm)	Dy_2O_3 (ppm)	Ho_2O_3 (ppm)	Er_2O_3 (ppm)	Tm_2O_3 (ppm)	Yb_2O_3 (ppm)	Lu_2O_3 (ppm)	Ta_2O_5 (ppm)	Nb_2O_5 (ppm)	ZrO_2 (ppm)	Ga_2O_3 (ppm)	HfO_2 (ppm)	ThO_2 (ppm)	SG (g/cc)
Mean	1.93	0.73	0.07	12.22	351	1,372	3,120	385	1,485	255	28	187	20	81	12	27	4	24	3	125	2,244	14,067	158	262	81	2.79
Max	67.00	12.16	0.81	106.16	4,502	29,897	106,561	6,143	11,660	3,425	288	2,151	302	1,148	333	735	103	721	110	1,241	22,050	67,550	396	2,726	1,239	3.71
Q3	2.00	1.03	0.10	14.95	456	1,959	4,282	560	2,179	377	41	274	28	107	14	33	5	32	5	184	3,209	21,350	185	393	108	2.87
Median	2.00	0.47	0.05	9.96	213	913	1,936	252	949	150	17	108	12	48	7	16	2	14	2	97	1,769	9,254	153	178	51	2.76
Q1	1.80	0.16	0.02	7.50	96	302	635	80	291	45	5	34	5	20	3	7	1	5	1	31	716	2,661	125	60	23	2.67
Min	0.01	0.01	0.00	2.24	4	10	0	3	12	2	0	1	0	1	0	0	0	0	0	0	41	9	34	0	0	1.93
IQR	0.20	0.87	0.08	7.45	360	1,657	3,647	480	1,888	332	36	240	23	87	11	26	4	27	4	153	2,493	18,690	60	333	85	0.20
CV	0.62	1.13	1.09	0.61	1.14	1.14	1.28	1.09	1.07	1.12	1.11	1.12	1.14	1.18	1.34	1.34	1.31	1.29	1.33	0.93	0.88	1.02	0.28	1.00	1.06	0.06
Number	5,085	5,029	5,029	5,029	5,029	5,029	5,029	5,029	5,029	5,029	5,029	5,029	5,029	5,029	5,029	5,029	5,029	5,029	5,029	4,767	4,767	4,767	4,767	4,767	5,029	1,666
ns		56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	318	318	318	318	318	56	3,419
Basal	**Length (m)**	**TREO (%)**	**HREO (%)**	**H/T (%)**	**Y_2O_3 (ppm)**	**La_2O_3 (ppm)**	**Ce_2O_3 (ppm)**	**Pr_2O_3 (ppm)**	**Nd_2O_3 (ppm)**	**Sm_2O_3 (ppm)**	**Eu_2O_3 (ppm)**	**Gd_2O_3 (ppm)**	**Tb_2O_3 (ppm)**	**Dy_2O_3 (ppm)**	**Ho_2O_3 (ppm)**	**Er_2O_3 (ppm)**	**Tm_2O_3 (ppm)**	**Yb_2O_3 (ppm)**	**Lu_2O_3 (ppm)**	**Ta_2O_5 (ppm)**	**Nb_2O_5 (ppm)**	**ZrO_2 (ppm)**	**Ga_2O_3 (ppm)**	**HfO_2 (ppm)**	**ThO_2 (ppm)**	**SG (g/cc)**
Mean	1.86	1.56	0.31	19.93	1,673	2,522	5,776	725	2,881	573	70	528	77	392	69	162	23	130	18	389	4,347	30,964	130	625	185	2.90
Max	4.50	11.78	2.16	65.61	14,962	31,661	58,550	6,840	11,660	2,817	303	2,498	403	2,551	517	1,112	159	952	136	1,542	21,367	67,550	299	2,547	1,206	3.61
Q3	2.00	1.91	0.41	26.07	2,189	3,171	7,225	916	3,665	749	90	688	100	518	92	213	29	164	23	497	5,500	42,324	144	814	253	2.99
Median	2.00	1.43	0.24	18.92	1,211	2,294	5,047	666	2,685	536	66	482	64	298	48	106	15	86	12	367	4,136	30,412	125	596	135	2.86
Q1	1.90	0.98	0.15	13.00	694	1,600	3,433	458	1,817	351	42	302	39	172	26	60	9	52	7	260	2,910	17,686	110	363	71	2.78
Min	0.02	0.04	0.01	4.18	41	63	146	19	69	11	1	10	1	7	1	2	0	2	0	3	142	802	70	15	2	2.26
IQR	0.10	0.94	0.26	13.07	1,495	1,572	3,792	458	1,849	398	49	386	61	346	66	153	20	112	16	237	2,590	24,639	34	451	182	0.22
CV	0.25	0.62	0.83	0.43	0.92	0.68	0.69	0.63	0.58	0.62	0.63	0.65	0.77	0.86	0.98	1.00	0.99	0.99	1.01	0.57	0.54	0.58	0.23	0.62	0.87	0.06
Number	915	915	915	915	915	915	915	915	915	915	915	915	915	915	915	915	915	915	915	887	887	887	887	887	915	276
Ns		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28	28	28	28	28	0	639
Lower	**Length (m)**	**TREO (%)**	**HREO (%)**	**H/T (%)**	**Y_2O_3 (ppm)**	**La_2O_3 (ppm)**	**Ce_2O_3 (ppm)**	**Pr_2O_3 (ppm)**	**Nd_2O_3 (ppm)**	**Sm_2O_3 (ppm)**	**Eu_2O_3 (ppm)**	**Gd_2O_3 (ppm)**	**Tb_2O_3 (ppm)**	**Dy_2O_3 (ppm)**	**Ho_2O_3 (ppm)**	**Er_2O_3 (ppm)**	**Tm_2O_3 (ppm)**	**Yb_2O_3 (ppm)**	**Lu_2O_3 (ppm)**	**Ta_2O_5 (ppm)**	**Nb_2O_5 (ppm)**	**ZrO_2 (ppm)**	**Ga_2O_3 (ppm)**	**HfO_2 (ppm)**	**ThO_2 (ppm)**	**SG (g/cc)**
Mean	2.01	0.18	0.03	18.31	171	322	687	88	338	60	7	51	7	36	6	15	2	12	2	35	554	4,073	120	95	31	2.79
Max	72.00	2.43	0.71	92.45	3,880	3,511	7,963	1,004	4,147	882	106	915	152	897	166	443	65	401	56	637	11,021	52,652	251	1,043	1,928	3.52
Q3	2.00	0.21	0.03	22.68	190	368	781	101	387	67	8	57	8	40	7	17	2	13	2	35	624	4,575	129	109	34	2.85
Median	2.00	0.13	0.02	17.80	111	220	471	61	233	41	5	34	5	23	4	9	1	7	1	18	352	2,774	119	70	20	2.78
Q1	2.00	0.08	0.01	13.33	73	135	291	37	143	26	3	22	3	15	2	6	1	5	1	10	211	1,802	108	47	13	2.73
Min	0.01	0.01	0.00	3.92	6	6	16	2	8	2	0	1	0	1	0	0	0	0	0	0	23	26	22	1	1	2.55
IQR	0.00	0.13	0.02	9.35	117	233	490	64	244	41	5	35	5	25	5	11	1	8	1	25	413	2,773	21	62	21	0.12
CV	0.90	1.05	1.23	0.39	1.25	1.07	1.09	1.06	1.08	1.13	1.11	1.17	1.20	1.32	1.42	1.44	1.46	1.48	1.44	1.53	1.18	1.07	0.17	0.93	1.64	0.04
Number	2,396	2,317	2,317	2,317	2,317	2,317	2,317	2,317	2,317	2,317	2,317	2,317	2,317	2,317	2,317	2,317	2,317	2,317	2,317	2,260	2,260	2,260	2,260	2,260	2,317	812
ns		79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	136	136	136	136	136	79	1,584

Total	Length (m)	TREO (%)	HREO (%)	H/T (%)	Y_2O_3 (ppm)	La_2O_3 (ppm)	Ce_2O_3 (ppm)	Pr_2O_3 (ppm)	Nd_2O_3 (ppm)	Sm_2O_3 (ppm)	Eu_2O_3 (ppm)	Gd_2O_3 (ppm)	Tb_2O_3 (ppm)	Dy_2O_3 (ppm)	Ho_2O_3 (ppm)	Er_2O_3 (ppm)	Tm_2O_3 (ppm)	Yb_2O_3 (ppm)	Lu_2O_3 (ppm)	Ta_2O_5 (ppm)	Nb_2O_5 (ppm)	ZrO_2 (ppm)	Ga_2O_3 (ppm)	HfO_2 (ppm)	ThO_2 (ppm)	SG (g/cc)
Mean	2.05	0.67	0.09	14.79	446	1,203	2,729	339	1,317	235	27	186	23	103	17	38	5	33	5	129	1,995	13,095	144	254	78	2.80
Max	157.10	12.16	2.16	106.16	14,962	31,661	106,561	6,840	11,660	3,425	303	2,498	403	2,551	517	1,112	159	952	136	1,542	22,050	67,550	396	2,726	1,928	3.71
Q3	2.00	0.99	0.10	19.48	491	1,797	3,946	514	2,012	354	40	267	28	112	16	37	5	34	5	187	3,036	19,740	167	374	100	2.87
Median	2.00	0.31	0.04	12.86	191	610	1,272	164	611	96	11	75	9	42	6	15	2	12	2	67	1,230	6,182	133	129	41	2.78
Q1	1.90	0.12	0.02	8.68	91	215	461	59	220	37	4	29	4	19	3	7	1	5	1	18	402	2,305	115	57	19	2.70
Min	0.01	0.01	0.00	2.24	4	6	0	2	8	2	0	1	0	1	0	0	0	0	0	0	16	9	22	0	0	1.93
IQR	0.10	0.87	0.08	10.80	400	1,582	3,485	455	1,792	317	36	238	24	93	13	30	4	29	4	169	2,634	17,435	52	317	81	0.17
CV	1.34	1.24	1.55	0.55	1.68	1.25	1.36	1.21	1.19	1.25	1.26	1.30	1.48	1.68	1.94	1.97	1.94	1.88	1.88	1.22	1.04	1.15	0.29	1.13	1.28	0.06
Number	8,563	8,271	8,271	8,271	8,271	8,271	8,271	8,271	8,271	8,271	8,271	8,271	8,271	8,271	8,271	8,271	8,271	8,271	8,271	7,924	7,924	7,924	7,924	7,924	8,271	2,769
ns		292	292	292	292	292	292	292	292	292	292	292	292	292	292	292	292	292	292	639	639	639	639	639	292	5,794

Table 17.3 Correlation Coefficients between Rare Earth Oxides

	Y_2O_3	La_2O_3	Ce_2O_3	Pr_2O_3	Nd_2O_3	Sm_2O_3	Eu_2O_3	Gd_2O_3	Tb_2O_3	Dy_2O_3	Ho_2O_3	Er_2O_3	Tm_2O_3	Yb_2O_3	Lu_2O_3
Y_2O_3	1	0.537	0.523	0.578	0.603	0.672	0.736	0.802	**0.944**	**0.983**	**0.980**	**0.971**	**0.953**	**0.915**	**0.879**
La_2O_3	0.537	1	**0.950**	**0.986**	**0.952**	**0.928**	0.892	0.857	0.712	0.593	0.491	0.461	0.467	0.495	0.494
Ce_2O_3	0.523	**0.950**	1	**0.951**	**0.933**	**0.912**	0.876	0.843	0.693	0.577	0.476	0.449	0.457	0.487	0.487
Pr_2O_3	0.578	**0.986**	**0.951**	1	**0.984**	**0.968**	**0.940**	**0.902**	0.754	0.631	0.529	0.500	0.511	0.542	0.542
Nd_2O_3	0.603	**0.952**	**0.933**	**0.984**	1	**0.983**	**0.960**	**0.924**	0.773	0.652	0.550	0.524	0.540	0.573	0.573
Sm_2O_3	0.672	**0.928**	**0.912**	**0.968**	**0.983**	1	**0.991**	**0.968**	0.838	0.724	0.625	0.601	0.616	0.647	0.644
Eu_2O_3	0.736	0.892	0.876	**0.940**	**0.960**	**0.991**	1	**0.985**	0.889	0.787	0.698	0.675	0.690	0.715	0.710
Gd_2O_3	0.802	0.857	0.843	**0.902**	**0.924**	**0.968**	**0.985**	1	**0.931**	0.849	0.769	0.749	0.756	0.773	0.761
Tb_2O_3	**0.944**	0.712	0.693	0.754	0.773	0.838	0.889	**0.931**	1	**0.978**	**0.940**	**0.920**	**0.910**	**0.894**	**0.868**
Dy_2O_3	**0.983**	0.593	0.577	0.631	0.652	0.724	0.787	0.849	**0.978**	1	**0.986**	**0.973**	**0.954**	**0.920**	**0.885**
Ho_2O_3	**0.980**	0.491	0.476	0.529	0.550	0.625	0.698	0.769	**0.940**	**0.986**	1	**0.994**	**0.974**	**0.932**	**0.896**
Er_2O_3	**0.971**	0.461	0.449	0.500	0.524	0.601	0.675	0.749	**0.920**	**0.973**	**0.994**	1	**0.989**	**0.955**	**0.923**
Tm_2O_3	**0.953**	0.467	0.457	0.511	0.540	0.616	0.690	0.756	**0.910**	**0.954**	**0.974**	**0.989**	1	**0.985**	**0.964**
Yb_2O_3	**0.915**	0.495	0.487	0.542	0.573	0.647	0.715	0.773	**0.894**	**0.920**	**0.932**	**0.955**	**0.985**	1	**0.994**
Lu_2O_3	**0.879**	0.494	0.487	0.542	0.573	0.644	0.710	0.761	**0.868**	**0.885**	**0.896**	**0.923**	**0.964**	**0.994**	1

17.4.4 DENSITY

The density database consists of 2,762 water emersion density measurements made on diamond drill core from throughout the Lake Zone deposit. The data are summarized in Table 17.4.

Table 17.4 Summary of Density Data

Domain	Upper	Basal	Lower	Diabase	Total
Mean	2.80	2.90	2.79	2.86	2.80
Max	3.71	3.61	3.52	2.93	3.71
Min	1.93	2.26	2.55	2.80	1.93
Number	1,472	276	809	8	2,762

The number of density data was sufficient to estimate the density of each block in the block model. In the case of Diabase, all blocks were assigned the average of the Diabase density measurements, 2.86 t/m^3. Unestimated blocks were assigned a density of 2.79 t/m^3 and overburden was assigned a density of 1.8 t/m^3.

17.5 BLOCK MODELLING

The block modelling and resource estimation were carried out using Datamine 3D modelling software. The block model parameters are summarized in Table 17.5.

Table 17.5 Block Model Parameters

	X	Y	Z
Min	415,850	6,885,850	-15
Max	417,750	6,887,700	250
Model Size	1,900	1,850	265
Block Size	10	10	5
Blocks	190	185	53

Six Domains were modelled in the Lake Zone:

1. Overburden Upper Zone.
2. Basal Zone.
3. Lower Zone.
7. “Waste Rock” outside of the drilled area.
8. Diabase Dykes.

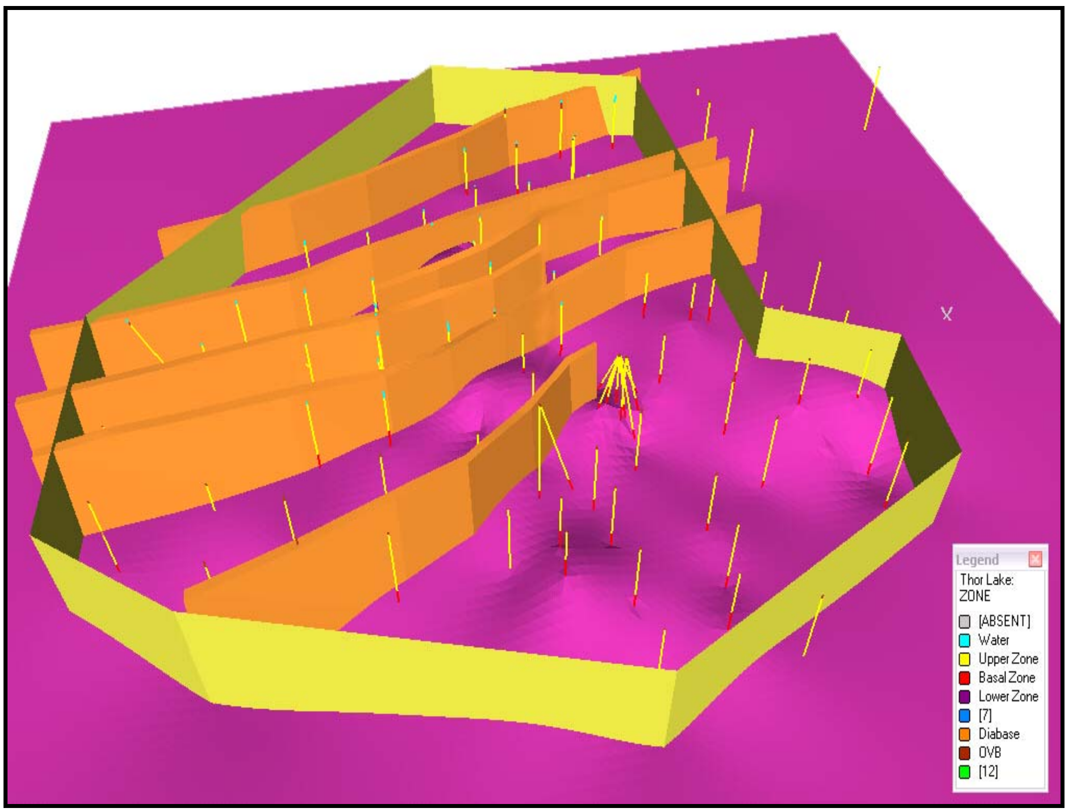
9. Overburden.

Wireframe surfaces were constructed to model the following contacts:

- Surface topography.
- Base of overburden.
- Upper Basal Zone contact.
- Lower Basal Zone contact.

Wireframe solids were built to model the Diabase dykes and the lateral extents of the Basal Zone. The latter was a perimeter approximately 100 m outside of the drilling. Figure 17.1 shows the Lower Basal Zone contact, Diabase dykes and confining wireframes along with the diamond drill holes used in the Mineral Resource Estimate. The drill holes have been coloured such that the Basal Zone intersections are red and the Upper Zone, yellow.

Figure 17.1 Lower Basal Zone Contact and Diabase Wireframe Models



Blocks in the Geological Model were labelled Basal Zone if the blocks were found between the upper and lower modelled surfaces. Blocks between the upper Basal Zone contact and overburden were called Upper Zone and all blocks below the lower Basal Zone contact were called Lower Zone.

Blocks found inside the Diabase wireframes were called Diabase regardless of the horizontal zone within which they were found. Similarly, blocks between the overburden and surface wireframes were flagged as overburden. No distinction was made between water and overburden.

Rare Earth grades were only estimated into Upper Zone and Basal Zone blocks.

17.6 RESOURCE ESTIMATION

Ordinary Kriging was used to estimate the grades of yttrium oxide, the 14 Rare Earth Oxides and oxides of: Ta, Nb, Zr, Ga, Hf and Th. Density was estimated using Inversed Distance Squared (ID^2).

It has been observed that the lower Basal Zone contact is the bottom of Rare Earth mineralization in the Lake Zone Deposit. Furthermore, the mineralization appears to occur in sub-horizontal layers which follow the undulations of the Basal contact surface. These observations were important in developing the estimation strategy used to generate the Lake Zone Mineral Resource Estimate. Horizontal semi-variograms were calculated using composite data that were flattened to the lower Basal Zone contact. Additionally, a dynamic anisotropy model was built to allow the search ellipsoid, used in grade estimation, to follow the undulations of the lower Basal Zone contact.

17.6.1 SEMI-VARIOGRAM ANALYSIS

Down hole semi-variograms were calculated to determine the Nugget Effect of each Oxide's semi-variogram model as well as the vertical continuity, and then horizontal semi-variograms were used to model the horizontal continuity. As discussed above, composite data flattened to the lower Basal Zone contact were used to calculate the horizontal semi-variograms.

The semi-variograms of all rare earth oxides are very similar, as would be expected considering the strong correlation that exists between all of the elements. They all have relatively low Nugget Effects accounting for, approximately, 13% of the total sill. The down hole semi-variograms are well behaved, but it was impossible to generate directional semi-variograms in the horizontal plane with any structure. This was assumed to be due to the high variability of the data and the relatively wide drill hole spacing (approximately 150 m). The omni-directional semi-variograms confirm this assumption as they are well behaved with ranges that are less than 90 m and average approximately 53 m. The down hole variograms have ranges which are similar to the omni-directional horizontal semi-variograms. The semi-variograms were fitted with three-structure nested spherical models that are summarized in Table 17.6. The semi-variograms themselves can be seen in Appendix E.

Table 17.6 Semi-Variogram Parameters

Oxide	Nugget Effect	First Structure Range				Second Structure Range				Third Structure Range			
	C0	C1	X	Y	Z	C2	X	Y	Z	C3	X	Y	Z
Y_2O_3	0.09	0.187	7.5	7.5	7.0	0.149	31.9	31.9	25.6	0.276	65.2	65.2	73.0
La_2O_3	0.09	0.142	6.5	6.5	6.7	0.151	19.2	19.2	14.7	0.217	43.2	43.2	53.8
Ce_2O_3	0.09	0.159	6.3	6.3	6.2	0.153	18.7	18.7	14.6	0.229	43.0	43.0	53.8
Pr_2O_3	0.09	0.140	5.4	5.4	6.0	0.166	15.2	15.2	15.1	0.221	39.9	39.9	51.5
Nd_2O_3	0.09	0.140	5.4	5.4	6.0	0.185	18.7	18.7	15.2	0.220	40.7	40.7	51.6
Sm_2O_3	0.09	0.177	5.8	5.8	6.6	0.183	21.1	21.1	17.0	0.235	41.4	41.4	53.0
Eu_2O_3	0.09	0.175	6.4	6.4	6.0	0.172	20.4	20.4	15.4	0.278	47.1	47.1	52.9
Gd_2O_3	0.09	0.175	6.3	6.3	6.0	0.161	17.1	17.1	14.4	0.290	44.6	44.6	52.1
Tb_2O_3	0.09	0.175	6.3	6.3	6.4	0.153	21.1	21.1	18.0	0.308	50.5	50.5	60.9
Dy_2O_3	0.07	0.200	7.3	7.3	6.6	0.152	26.5	26.5	23.6	0.300	59.5	59.5	66.3
Ho_2O_3	0.09	0.180	7.3	7.3	5.6	0.152	30.1	30.1	22.3	0.333	67.7	67.7	74.8
Er_2O_3	0.07	0.206	7.7	7.7	5.6	0.117	28.9	28.9	22.4	0.348	62.2	62.2	68.8
Tm_2O_3	0.08	0.321	10.1	10.1	5.6	0.144	24.6	24.6	30.9	0.287	47.7	47.7	86.3
Yb_2O_3	0.08	0.284	6.9	6.9	8.0	0.181	45.0	45.0	38.4	0.222	68.1	68.1	82.7
Lu_2O_3	0.16	0.306	10.5	10.5	6.7	0.189	30.5	30.5	30.1	0.244	55.6	55.6	110.0
Ta_2O_5	0.08	0.164	6.9	6.9	6.0	0.090	25.2	25.2	15.4	0.343	54.9	54.9	64.8
Nb_2O_5	0.10	0.118	6.9	6.9	6.8	0.082	20.1	20.1	15.6	0.190	48.2	48.2	62.5
ZrO_2	0.10	0.176	6.3	6.3	5.8	0.182	20.4	20.4	17.5	0.246	40.4	40.4	49.9
Ga_2O_3	0.01	0.019	3.9	3.9	6.4	0.010	10.3	10.3	15.2	0.036	91.2	91.2	47.6
HfO_2	0.10	0.170	7.0	7.0	6.1	0.117	17.3	17.3	15.1	0.299	42.6	42.6	48.1
ThO_2	0.08	0.149	5.2	5.2	6.2	0.126	15.2	15.2	12.5	0.218	50.4	50.4	47.7

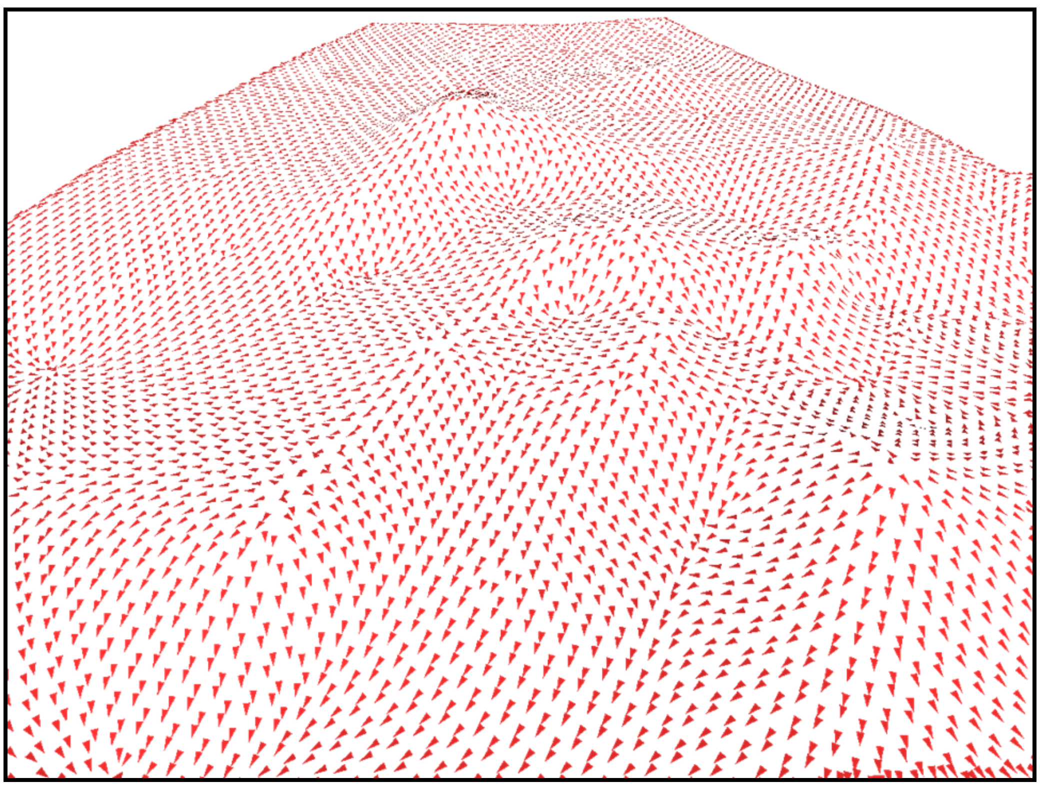
17.6.2 DYNAMIC ANISOTROPY MODEL

The Lake Zone Rare Earth mineralization appears to occur in sub-horizontal layers and follow the undulations of the lower Basal Zone contact surface. Additionally, the highest HREO concentrations are found along the lower contact of the Basal Zone and then drop-off with greater distance from it.

The Lake Zone model is, therefore, well suited to the use of the Dynamic Anisotropy Option recently developed by Datamine. This is a tool which allows the orientation of the search ellipsoid to be defined individually for each block in the model. By building a dynamic anisotropy model, it was possible to ensure that the search ellipsoid, used in grade estimation, followed the undulations of the lower Basal Zone contact.

To use Dynamic Anisotropy, one must first interpolate into the geology model the dip-direction and dip angles of the search ellipsoid before using them for grade estimation. The angles can be derived from the orientation of wireframe triangles and/or from strings digitised in plan and section. In the Lake Zone model, the lower Basal Zone contact was used to generate an array of points, each with the dip and dip-direction of the surface at that location. These data were then used to interpolate the dip-direction and dip of the search ellipsoid axis into the block model. The points are shown as arrows in Figure 17.2 which point down the slope of the Lower Basal Zone contact.

Figure 17.2 Basal Zone Directional Point Data



17.6.3 ESTIMATION PARAMETERS

Ordinary kriging was used to estimate the block grades in the Basal and Upper Zones of the Lake Zone deposit. A three pass search was employed where each successive pass used double the search radius of the previous one.

With the major search axis oriented down the slope of the Lower Basal Zone contact, the first pass search had a radius of 60 m, approximately equal to the average range of the horizontal semi-variograms. The minor (z) search axis was oriented perpendicular to the Lower Basal Contact and the first pass search radius was 30 m. A minimum of four and a maximum of 16, 2.5 m composites were used to estimate a block grade. To ensure that the data came from at least two holes, a maximum of three composites per drill was allowed. If more than 16 data were found within the search ellipsoid, the 16 samples nearest to the block centre were used.

The minimum number of data required to make an estimate was decreased to three for the second and third passes, thus removing the requirement for data from at least two holes. The search parameters are summarized in Table 17.7.

Table 17.7 Search Parameters

	Search Radii			Samples Required		
Pass	**X**	**Y**	**Z**	**Min**	**Max**	**Max/dh**
1st	60	60	30	4	15	3
2nd	120	120	60	3	15	3
3rd	240	240	120	3	15	3

For the estimation of density, ID^2 was used, and the minimum number of data required to estimate a block, was two. Unestimated blocks were assigned a density of 2.79 t/m^3, diabase was assigned a density of 2.86 t/m^3 and overburden was assigned a density of 1.8 t/m^3.

17.6.4 RESOURCE CLASSIFICATION

Blocks estimated using the first pass search were classified as Indicated Resources and all blocks estimated during the second or third passes were classified as Inferred. Indicated Resources were only found in areas where the drill holes were within 60 m of one another, so that data from two holes could be used to make an estimate. These conditions were only satisfied in the area of the metallurgical holes and thus additional, closely-spaced drilling is required to outline sufficient Indicated Resources to support a pre-feasibility study.

It is recommended that fill-in drilling be conducted using a nominal 50 m drill hole spacing to upgrade Inferred Resources to an Indicated classification.

17.6.5 RESOURCE TABULATION

The Indicated and Inferred Mineral Resource Estimate for the Lake Zone deposit is summarized in Table 17.8 and 17.9 using a range of TREO (%) cut-off grades. Two sets of cross-sections through the Lake Zone block model are found in Appendix F. In one set of cross-sections, the blocks are colour-contoured by TREO grade and in the other by HREO grade.

Table 17.8 Summary of Lake Zone Indicated Mineral Resource

Upper Zone – Indicated Mineral Resource

Cut-Off TREO (%)	Tonnes (x1000)	TREO (%)	HREO (%)	H/T (%)	Y_2O_3 (ppm)	La_2O_3 (ppm)	Ce_2O_3 (ppm)	Pr_2O_3 (ppm)	Nd_2O_3 (ppm)	Sm_2O_3 (ppm)	Eu_2O_3 (ppm)	Gd_2O_3 (ppm)	Tb_2O_3 (ppm)	Dy_2O_3 (ppm)	Ho_2O_3 (ppm)	Er_2O_3 (ppm)	Tm_2O_3 (ppm)	Yb_2O_3 (ppm)	Lu_2O_3 (ppm)	Ta_2O_5 (ppm)	Nb_2O_5 (ppm)	ZrO_2 (ppm)	Ga_2O_3 (ppm)	HfO_2 (ppm)	Th (ppm)
1.60	1,873	1.96	0.19	9.7%	843	3610	8552	986	3834	685	73	511	54	218	34	81	11	72	11	328	5114	33169	174	683	167
1.80	1,161	2.12	0.20	9.3%	865	3936	9368	1068	4136	738	78	542	55	222	33	81	11	76	11	357	5582	35411	174	749	176
2.00	723	2.26	0.20	9.1%	888	4191	10050	1134	4364	783	82	571	58	229	34	81	11	77	12	370	5858	37165	170	795	185
2.20	313	2.46	0.21	8.7%	908	4585	11156	1233	4685	849	90	612	62	243	35	84	12	80	12	406	6628	40623	161	884	196

Basal Zone – Indicated Mineral Resource

Cut-Off TREO (%)	Tonnes (x1000)	TREO (%)	HREO (%)	H/T (%)	Y_2O_3 (ppm)	La_2O_3 (ppm)	Ce_2O_3 (ppm)	Pr_2O_3 (ppm)	Nd_2O_3 (ppm)	Sm_2O_3 (ppm)	Eu_2O_3 (ppm)	Gd_2O_3 (ppm)	Tb_2O_3 (ppm)	Dy_2O_3 (ppm)	Ho_2O_3 (ppm)	Er_2O_3 (ppm)	Tm_2O_3 (ppm)	Yb_2O_3 (ppm)	Lu_2O_3 (ppm)	Ta_2O_5 (ppm)	Nb_2O_5 (ppm)	ZrO_2 (ppm)	Ga_2O_3 (ppm)	HfO_2 (ppm)	Th (ppm)
1.60	2,186	2.14	0.43	20.0%	2274	3374	8073	970	3937	780	95	717	104	533	93	220	31	182	25	520	5892	39610	134	829	198
1.80	1,573	2.31	0.47	20.4%	2508	3599	8696	1042	4248	849	104	783	114	587	102	244	35	203	28	563	6257	41743	128	888	202
2.00	1,054	2.52	0.53	20.9%	2825	3875	9436	1125	4587	922	113	852	128	662	116	277	40	231	32	626	6816	44644	123	972	219
2.20	731	2.71	0.57	21.1%	3068	4135	10156	1205	4917	987	121	910	139	723	127	305	44	253	35	676	7287	46710	119	1041	239

Total Lake Zone – Indicated Mineral Resource

Cut-Off TREO (%)	Tonnes (x1000)	TREO (%)	HREO (%)	H/T (%)	Y_2O_3 (ppm)	La_2O_3 (ppm)	Ce_2O_3 (ppm)	Pr_2O_3 (ppm)	Nd_2O_3 (ppm)	Sm_2O_3 (ppm)	Eu_2O_3 (ppm)	Gd_2O_3 (ppm)	Tb_2O_3 (ppm)	Dy_2O_3 (ppm)	Ho_2O_3 (ppm)	Er_2O_3 (ppm)	Tm_2O_3 (ppm)	Yb_2O_3 (ppm)	Lu_2O_3 (ppm)	Ta_2O_5 (ppm)	Nb_2O_5 (ppm)	ZrO_2 (ppm)	Ga_2O_3 (ppm)	HfO_2 (ppm)	Th (ppm)
1.60	4,059	2.06	0.32	15.5%	1614	3483	8294	977	3890	736	85	622	81	388	65	156	22	131	19	431	5533	36638	153	762	184
1.80	2,734	2.23	0.35	15.9%	1810	3742	8981	1053	4201	802	93	681	89	432	73	175	25	149	21	475	5970	39053	148	829	191
2.00	1,778	2.41	0.40	16.4%	2037	4003	9686	1128	4496	865	101	737	99	486	83	198	28	168	24	522	6426	41601	142	900	205
2.20	1,045	2.64	0.46	17.6%	2420	4270	10456	1213	4847	946	112	820	116	579	99	239	34	201	28	595	7089	44884	132	994	226

Table 17.9 Summary of Lake Zone Inferred Mineral Resource Model Validation

Upper Zone – Inferred Mineral Resource																									
Cut-Off TREO (%)	**Tonnes (x1000)**	**TREO (%)**	**HREO (%)**	**H/T (%)**	**Y_2O_3 (ppm)**	**La_2O_3 (ppm)**	**Ce_2O_3 (ppm)**	**Pr_2O_3) (ppm)**	**Nd_2O_3 (ppm)**	**Sm_2O_3 (ppm)**	**Eu_2O_3 (ppm)**	**Gd_2O_3 (ppm)**	**Tb_2O_3 (ppm)**	**Dy_2O_3 (ppm)**	**Ho_2O_3 (ppm)**	**Er_2O_3 (ppm)**	**Tm_2O_3 (ppm)**	**Yb_2O_3 (ppm)**	**Lu_2O_3 (ppm)**	**Ta_2O_5 (ppm)**	**Nb_2O_5 (ppm)**	**ZrO_2 (ppm)**	**Ga_2O_3 (ppm)**	**HfO_2 (ppm)**	**Th (ppm)**
1.60	32,707	2.10	0.17	8.2	766	3774	9707	1057	4016	706	76	488	50	190	26	56	8	54	8	233	4045	27542	163	512	165
1.80	19,825	2.36	0.18	7.7	797	4223	11306	1161	4349	764	82	522	53	202	27	58	8	56	8	236	4080	27225	158	512	177
2.00	13,070	2.60	0.19	7.1	813	4626	12866	1255	4617	807	85	540	55	208	28	58	8	56	8	231	4152	27060	158	512	186
2.20	8,548	2.87	0.20	6.8	854	5036	14676	1347	4874	851	90	566	58	221	29	60	9	57	8	225	4151	26218	157	494	196
Basal Zone – Inferred Mineral Resource																									
Cut-Off TREO (%)	**Tonnes (x1000)**	**TREO (%)**	**HREO (%)**	**H/T (%)**	**Y_2O_3 (ppm)**	**La_2O_3 (ppm)**	**Ce_2O_3 (ppm)**	**Pr_2O_3) (ppm)**	**Nd_2O_3 (ppm)**	**Sm_2O_3 (ppm)**	**Eu_2O_3 (ppm)**	**Gd_2O_3 (ppm)**	**Tb_2O_3 (ppm)**	**Dy_2O_3 (ppm)**	**Ho_2O_3 (ppm)**	**Er_2O_3 (ppm)**	**Tm_2O_3 (ppm)**	**Yb_2O_3 (ppm)**	**Lu_2O_3 (ppm)**	**Ta_2O_5 (ppm)**	**Nb_2O_5 (ppm)**	**ZrO_2 (ppm)**	**Ga_2O_3 (ppm)**	**HfO_2 (ppm)**	**Th (ppm)**
1.60	28,447	1.99	0.44	22.1	2366	3087	7198	891	3590	734	91	694	106	557	100	240	34	193	27	482	5196	37178	124	750	181
1.80	18,181	2.16	0.49	22.4	2619	3336	7810	961	3873	791	99	748	116	614	111	266	37	213	29	512	5492	39002	124	791	197
2.00	11,795	2.31	0.52	22.4	2792	3563	8387	1026	4128	843	105	794	124	656	118	283	40	226	31	548	5815	40659	123	831	211
2.20	6,594	2.48	0.57	22.9	3088	3796	8914	1091	4394	902	112	854	135	723	130	310	43	241	33	582	6076	42837	122	882	224
Total Lake Zone – Inferred Mineral Resource																									
Cut-Off TREO (%)	**Tonnes (x1000)**	**TREO (%)**	**HREO (%)**	**H/T (%)**	**Y_2O_3 (ppm)**	**La_2O_3 (ppm)**	**Ce_2O_3 (ppm)**	**Pr_2O_3) (ppm)**	**Nd_2O_3 (ppm)**	**Sm_2O_3 (ppm)**	**Eu_2O_3 (ppm)**	**Gd_2O_3 (ppm)**	**Tb_2O_3 (ppm)**	**Dy_2O_3 (ppm)**	**Ho_2O_3 (ppm)**	**Er_2O_3 (ppm)**	**Tm_2O_3 (ppm)**	**Yb_2O_3 (ppm)**	**Lu_2O_3 (ppm)**	**Ta_2O_5 (ppm)**	**Nb_2O_5 (ppm)**	**ZrO_2 (ppm)**	**Ga_2O_3 (ppm)**	**HfO_2 (ppm)**	**Th (ppm)**
1.60	61,154	2.05	0.30	14.5	1510	3454	8540	980	3818	719	83	584	76	361	60	141	20	119	17	349	4580	32024	145	623	172
1.80	38,006	2.27	0.33	14.4	1669	3799	9634	1066	4121	777	90	630	83	399	67	157	22	131	18	368	4755	32859	142	646	187
2.00	24,865	2.46	0.34	13.9	1752	4122	10741	1146	4385	824	95	660	87	421	70	165	23	137	19	382	4941	33511	142	664	198
2.20	15,142	2.70	0.36	13.2	1827	4496	12167	1236	4665	873	99	691	92	439	73	169	24	137	19	381	4989	33456	142	663	208

17.6.6 Comparison with Earlier Resource Estimates

In March 2007, Wardrop produced a Technical Report, followed in June 2007, by a Preliminary Economic Analysis, which discussed the Mineral Resource Estimate of the Thor Lake Property. The 2007 Lake Zone Resource is compared to the current resource estimate using a 1.0 % Y_2O_3 cut-off in Table 17.10.

Table 17.10 Lake Zone Deposit Mineral Resource Comparison

Year	Zone	Resource Category	Cut-Off Y_2O_3 (%)	Tonnes (x1000)	TREO + Y_2O_3 (%)	HREO (%)	H/T (%)	Ta_2O_5 (%)	Nb_2O_5 (%)	ZrO_2 (%)
2007	**Total**	Inferred	0.100	14,005	1.23	N.D.	N.D.	0.025	0.33	1.73
2009	**Upper**	Indicated	0.100	1,381	1.57	0.24	15.4%	0.033	0.46	3.17
2009	**Upper**	Inferred	0.100	16,667	1.58	0.25	15.8%	0.028	0.38	2.80
2009	**Basal**	Indicated	0.100	3,519	1.81	0.37	20.7%	0.046	0.51	3.47
2009	**Basal**	Inferred	0.100	69,418	1.55	0.35	22.6%	0.040	0.43	3.16
2009	**Total**	Indicated	0.100	4,900	1.74	0.34	19.4%	0.042	0.50	3.39
2009	**Total**	Inferred	0.100	86,084	1.56	0.33	21.3%	0.038	0.42	3.09

Almost all of the increase in total Mineral Resources is due to the discovery and delineation of the Basal Zone. The size of the 2007 Mineral Resource Estimate compares quite closely to that of the 2009 Estimate of the Upper Zone. This is likely because few of the older holes were long enough to penetrate the Basal Zone.

18.0 OTHER RELEVANT DATA AND INFORMATION

There is no other relevant data or information applicable to the property.

19.0 MINING OPERATIONS

There have been no mining operations at this site. A PEA was completed by Wardrop in 2005 to assess the economics of an open pit recovering the mineralized material and then processed to market the REEs.

20.0 INTERPRETATION AND CONCLUSIONS

The Technical Report discusses the re-interpretation and re-estimation of the Lake Zone deposit previously described in the Preliminary Economic Analysis of the Thor Lake Project generated by Wardrop in 2007. Since the PEA was issued, Avalon has drilled 85 deep diamond drill holes which led to the discovery of the Basal Zone, below the area modelled in 2006/2007.

The data used in the modelling of the Lake Zone Deposit consisted of 91 diamond drill holes totalling 17,533.6 m of core: 85 holes totalling 16,840 m were drilled in 2007 and 2008 and six older holes, totalling 833.8 m, were added after they were re-analysed to include the full suite of REE.

The exploration program has been performed using industry standard practices, but there would appear to be a problem with the Rare Earth Element analyses received from the Acme Lab. Analysis of the results of the QA/QC standards, inserted into the sample stream, indicates an average low bias greater than 5% relative to the Certified Means of the standards. More work needs to done to determine the veracity of this apparent bias which may have led to an under-estimation of the deposit grade.

The Basal Zone has been modelled as a relatively flat, undulating layer of material enriched in Heavy Rare Earth Elements. It is possible that these undulations are in fact fault off-sets since it is known that the Lake Zone deposit is cut by ENE striking, sub-vertical faults and diabase dykes. The dominantly vertical diamond drill holes made the identification and interpretation of fault off-sets nearly impossible.

The Lake Zone Mineral Resource is summarized in Table 20.1 at a TREO cut-off grade of 1.6%.

Table 20.1 Lake Zone Mineral Resource Summary

Zone	Resource Class	Cut-Off TREO (%)	Tonnes (x1000)	TREO (%)	HREO (%)	H/T (%)
Basal	Indicated	1.60	2,186	2.14	0.43	20.0
Upper	Indicated	1.60	1,873	1.96	0.19	9.7
Total	Indicated	1.60	4,059	2.06	0.32	15.5
Zone	**Resource Class**	**Cut-Off TREO (%)**	**Tonnes (x1000)**	**TREO (%)**	**HREO (%)**	**H/T (%)**
Basal	Inferred	1.60	28,447	1.99	0.44	22.1
Upper	Inferred	1.60	32,707	2.10	0.17	8.2
Total	Inferred	1.60	61,154	2.05	0.30	14.5

The majority of the Lake Zone Mineral Resource has been classified as Inferred due to the wide drill hole spacing (150 m), relative to the semi-variogram ranges (average 53 m).

21.0 RECOMMENDATIONS

From the conclusions presented above, the following recommendations are made:

1. The potential of a negative bias in the Rare Earth Analyses from Acme requires immediate attention. This should include the re-examination or augmentation of the round robin data used to certify the three Avalon standards. The estimated cost for this process is $40,000.

2. In-fill diamond drilling to increase resource confidence should be at a nominal spacing of 50 m. Angled holes, drilled perpendicular to the East North East (ENE) striking faults and diabase dykes, are recommended to assist in the modelling of the Basal Zone and Upper Zone mineralization. Costs for this program are estimated to be approximately $2.5 million.

3. The re-analysis of more of the older, pre-2007, diamond drill holes (1-51) would be a cost-effective way to add to the database for future resource updates, particularly for any core samples that intersect the Basal Zone.

4. Completion of a NI 43-101 technical compliant updated Resource Report upon the completion of the fill-in diamond drilling. The approximate cost to produce this report is estimated to be $100,000.

22.0 REFERENCES

22.1 GEOLOGICAL REFERENCES

Beus, A.A., Severov, E.A., Sitinin, A.A., and Subbotin, K.D. (1962): Albitized and Greisenized Granites (apogranites), NAUKLAD, SSSR, Moscow.

Brownell, G.M. (1959): A beryllium detector for field exploration, Econ. Geo, v.54, No.6.

Campbell, S. W. (1981) "Drilling Report on the Thor Lake Property". Placer Development Ltd. Assessment Report No. 081343.

Campbell, S. W. (1981) "Drilling Report on the Thor Lake Property". Placer Development Ltd. Assessment Report No. 081343.

Cerny Petr and Trueman, D. L. (1985) "Polylithionite from Thor Lake, NWT", University of Manitoba.

Cerny P. and Trueman, D. L. (1985) "Polylithionite from Thor Lake, NWT", Amer. Min., v.70, pp 1127-1134.

Currie, J. A. (2004): Summary Report Thor Lake Property; prepared for Beta Minerals Inc., 79 p.

Davidson, A. (1972): Granite Studies in the Slave Province; in Report of Field Activities, Part A. Geological Survey of Canada; Paper 72-1A, pp109-115.

Davidson, A. (1978): The Blatchford Lake Intrusive Suite; an Aphebian alkaline plutonic complex in the Slave Province, Northwest Territories: in Current Research, Part A, Geological Survey of Canada, Paper 78-1a, pp119-127.

Davidson, A. (1981): Petrochemistry of the Blatchford Lake complex, District of Mackenzie; Geological Survey of Canada, Open File 764.

Davidson, A. (1982): Petrochemistry of the Blatchford Lake Complex near Yellowknife, Northwest Territories: in Uranium; in Granites, Y.T. Maurice (ed); Geological Survey of Canada, Paper 81-23, pp71-79.

de St. Jorre, L. (1986) “Economic Mineralization of the T Zone, Thor Lake, NWT." M.Sc. Thesis, University of Alberta.

de St, Jorre, L. and Smith, D. G. W. (1986) "Cathodoluminescence of Gallium-Enriched Feldspars from the Thor Lake, NWT,Rare-Metal Deposit". University of Alberta.

Gidiuck, M. J. (1986) "Blatchford Lake Project. A Compilation and Evaluation of the Thor Lake Beryllium-Yttrium-Niobium-Lanthanide Property, NWT". For Union Oil Company of Canada Ltd. 2 Volumes.

Gupta, C.K. and Krishnamurthy, N. (2005): Extractive Metallurgy of the Rare Earths, CRC Press.

Hylands, J.J. (1980) "Geological, Geophysical and Drilling Report on the Thor Lake Property". Placer Development Ltd. Assessment Report 081258.

Hylands, J.J., Campbell, S. W, (1980) "Progress Report on Highwood Resources' Thor Lake Property". Placer Development Ltd.

Jambor, J. L.(1985) "Mineralogy of Beryllium-Yttrium Zones in the Thor Lake Rare-Metal Deposit, NWT." Process Mineralogy Section, Mineral Processing Laboratory. Project MRP-3.3.9.9.99, Job No. 025214S.

Johnson, W. (1978) "Notes to Accompany Various Maps on the Thor Lake Project". Target Exploration Services Ltd for Highwood Resources Ltd. Assessment Report No. 080720.

Johnson, W. (1978) "Report on Diamond Drilling Thor and NB Claims. October 1 to November 30, 1978". Target Exploration Services Ltd. for Highwood Resources Ltd.

Johnson, W. (1980) "Report on Trenching, Diamond Drilling, Geological Mapping and Radon Surveys". Target Exploration Services Ltd. for Highwood Resources Ltd. Assessment Report No. 081227.

Johnson, W. (1980) "Report on Geological Mapping and Prospecting; Amazing Grace 1 Claim". Target Exploration Services Ltd. for Highwood Resources Ltd. Assessment Report No. 081241.

LeCouteur, P.C. (2002): Geological Report on the Lake Zone; prepared for Navigator Exploration Corp., 36 p.

Lindsey, H. Eugene (1987) "Thor Lake Project; Ore Reserves and Further Exploration, NWT, Canada".

Lisle, T. E., and Seraphim, R R. (1977) "Report on the Thor Prospect, Highwood Resources Ltd".

Machida, K. (2006): Letter report to Avalon Ventures Ltd. of October 12, 2006.

Mariano, T. (1982) "Report on Visit to Thor Lake Property, NWT'. Union Oil Company of Canada Ltd.

Mariano, A.N. (2006): Letter report to K. Palmer of November 6, 2006.

McGinn, G. J. (1976) "A Report to the President of Highwood Resources Ltd. on the Thor Claim Group, NWT".

Merivale, C. (2006): Letter report to Avalon Ventures Ltd. of September, 2006.

Newton, A. R, and Slaney, V. R (1978) "Geological Interpretation of an Airborne Gamma- Ray Spectrometer Survey of the Hearn Lake Area, NWT'. EMPR, Paper 77-32.

Palmer, K., Broad, P. (2007): Report to Avalon Ventures Ltd. “Technical Report on the Thor Lake Rare Metals Project, NT” Wardrop Document No. 0551530201-REP-R0001-01.

Palmer, K., Broad, P., Franklin, P.R. (2007): Report to Avalon Ventures Ltd. “Preliminary Economic Assessment on the Thor Lake Rare Metals Project, NT” Wardrop Document No. 0551530201-REP-R0001-03.

Pedersen, Jens C. (1988): Final Report on the Lake Zone Diamond Drilling of January-March, 1988; prepared for Highwood Resources Ltd., 25 p.

Pedersen, J. C, LeCouteur, P. C. (1990) "The Thor Lake Beryllium-Rare Metal Deposits, NWT". Field trip guidebook for the International Association on the Genesis of Ore Deposits, 8th IAGOD Symposium, Ottawa.

Pederson, J.C., Trueman, D.L., Mariano, A.N. (2007): The Thor Lake Rare Earths-Rare Metal Deposites, Northwest Territories. Field Trip Guidebook GAC/MAC Annual Meeting, Field Trip Guidebook.

Pinckston, D. R (1989) "Mineralogy of the Lake Zone Deposit, Thor Lake, NWT'. Unpublished MSc Thesis, University of Alberta.

Richardson, D.G. and Birkett, T.C. (1995): Peralkaline rock-associated rare metals; in Geology of Canadian Mineral Deposit Types; in O.R. Eckstrand, W.D. Sinclair, and R.I. Thorpe (eds); Geological Survey of Canada, Geology of Canada no.8, pp523-540 (also Geol. Soc. America, The Geology of America, v P-1).

Seraphim, R. H. (1977) “Report on the Thor Prospect, Highwood Resources Ltd."

Sinclair, W.D. and Richardson, D.G. (1994) 'Studies of Rare-Metal Deposits in the Northwest Territories". GSC Bulletin 475.

Scherba, N. (1970): Greisens, Int. Geo Rev. v.12

Taylor, R P. and Pollard, P. J. (1988) "The Peralkaline Garnite-Syenite Contact in the Thor Lake Area, NT, and its Relationship to the T Zone Mineralization and Alteration". Dept. of Earth Sciences, Carleton University, Ottawa, ON.

Thomas, D. G. (1977) "Geology, Geophysics and Diamond Drilling on the Thor & NB Claims; July 1, 1976 to August 31,1977". Highwood Resources Ltd.

Trueman, D. L. (1983) "Update on the Thor Lake Rare-Metals Deposit". Text of presentation to GeoScience Forum, NWT. Highwood Resources Ltd.

Trueman, D. L., Pederson, J. C., de St- Jorre, L., and Smith, D. G. W. (1984) "Geology of the Thor Lake Beryllium Deposit; An Update7'. Pages 115-120, Contributions to the Geology of the NWT. Dept of Indian and Northern Affairs.

Trueman, D. L., Pederson, J. C., de St. Jorre, L., and Smith, D. G. W. (1985) "The Thor Me, NWT, Rare-Metal Deposits"; Abstract. Granite-Related Mineral Deposits-Halifax 1985 CIMM.

(1985) "Airborne Electromagnetic Survey for the Thor Lake and Blanchet Island Area, NW'. File No. 27026. By Questor Surveys Ltd. for Highwood Resources Ltd.

(1988) “Geological Mapping & Geochemical Sampling of the Fluorite & Cusp Zone, Thor Lake, NWT". Wighwood Resources Ltd.

(1988) "Project Description; Thor Lake Joint Venture". Hecla Mining Company of Canada Ltd. Highwood Resources Ltd.

(1988) "Airborne Geophysical Survey, Blatchford Lake (Thor Lake) Alkaline Complex, NWT". Part of 85I/2 and part of 85I/l. Gamma Ray Spectrometer, VLF and Magnetometer Colour Map with Accompanying Profile Maps, Stacked Profiles and Geology. 1:100 000 scale. EMPR, MDA.

22.2 METALLURGICAL REFERENCES

22.2.1 LAKEFIELD RESEARCH REPORTS

May 31, 1985; Lakefield Research, Project No. 2963. An Investigation of the Recovery of Beryllium, Progress Report No. 1, 42 p.

Nov 7, 1985; Lakefield Research, Project No. 2963. An Investigation of the Recovery of Beryllium, Progress Report No. 2, 78 p.

Dec 20, 1985; Lakefield Research, Project No. 2963. An Investigation of the Recovery of Beryllium, Yttrium and Rare Earth Oxides, Progress Report No. 3, 235 p.

Feb 14, 1986; Lakefield Research, Project No. 2963. An Investigation of the Recovery of Beryllium, Yttrium and Rare Earth Oxides, Progress Report No. 4, 213 p.

April 1, 1986; Highwood Resources Ltd. Technical Feasibility of Novel Flotation Process for the Recovery of Beryllium, Yttrium and Rare Earths Concentrate from the Mineral Deposits at Thor Lake, NWT.

April 16, 1986; Lakefield Research, Project No. 2963. An Investigation of the Recovery of Beryllium, Yttrium and Rare Earth Oxides, Progress Report No. 5, 49 p.

April 16, 1986; Lakefield Research, Project No. 3125A. An Investigation of Effluent and Tailings Treatment from Pilot Plant Products, Progress Report 8B.

June 2, 1986; Lakefield Research, Project No. 2963. An Investigation of the Recovery of Beryllium, Yttrium and Rare Earth Oxides from, Progress Report No. 7, 75p.

June 12, 1986; Lakefield Research, Project No. 2963 and 3125. An Investigation of the Recovery of Beryllium, Yttrium and Rare Earth Oxides from, Progress Report No. 6, 85p.

July 4, 1986; Lakefield Research, Project No. 3 125A. Effluent and tailing treatment from pilot plant products Progress Report No. 8.

July 18, 1986; Lakefield Research, Project No. 3125B. Recovery of Beryllium from Thor Lake Pilot Plant Samples, E Zone Ore, Summary Report, Progress Report No. 1, 389 p.

August 13,1986; Lakefield Research, Project No. 3125A. An Investigation of Effluent and Tailing Treatment from Pilot Plant Products submitted by Strathcona Minerals Services. Progress Report No. 8.

Oct 17, 1986; Lakefield Research Project No. 3 125C. A Pilot Plant Investigation of the Recovery of Rare Earth Oxides from a Thor Lake Pilot Plant Samples, Progress Report No. 2, 234p.

Oct 27, 1986; Lakefield Research, Project No. 3125B. Recovery of Beryllium from Thor Lake Pilot Plant Samples, E Zone Ore, Summary Report, Progress Report No. 1.

Dec 2, 1986; Lakefield Research, Project No. 3125D. A Pilot Plant Investigation of the Recovery of Fibre Earth Oxides from a Thor Lake Pilot Plant Samples, Progress Report No. 3, 481p.

Dec 5, 1986; Lakefield Research, Project No. 3125E. Pilot Plant Inventory of the Recovery of Fibre Earth Oxides from Thor Lake Samples, Progress Report No. 4, 147p.

April 29, 1987; Lakefield Research, Project No. 3233. An Investigation of the Recovery of Beryllium from Thor Lake 'C' Ore Sample, Progress Report 6, 238p.

May 8, 1987; Lakefield Research, Project No. 3193. Environmental Characterization of Ore, Waste Rock, and Flotation Products from Pilot Plant Samples, Progress Report 5, 117p

June 3, 1987; Lakefield Research, Project No. 3235. An Investigation of Yttrium Concentrates Upgrading from Pilot Plant Ore and Concentrate, Progress Report 7, 78p.

August 17, 1987; Lakefield Research, Project No. 3349 and 3233. The Recovery of Beryllium, Yttrium, Niobium, and Rare Earth Oxides from Thor Lake Samples, Progress Report No. 8, 52 p.

May 27, 1988; Lakefield Research, Project No. 3363. An Investigation of the Recovery of Beryllium from Thor Lake Samples, Progress Report 1, 142 p.

August 2, 1988; Lakefield Research, Project No. 3521. An Investigation of the Recovery of Beryllium from Thor Lake Pilot Plant Samples, Progress Report 2, 568 p.

April 7, 1989; Lakefield Research Project 3623. An investigation of the Recovery of Beryllium from Thor Lake E Ore Zone Samples. Progress Report No. 3. 59 p.

January, 2002. Lakefield Research Project 10302-001. An Investigation into the Recovery of Tantalum, Niobium, Zircon, Yttrium and Rare Earth Oxides from the Thor Lake, Lake Zone Sample submitted by Navigator Exploration Corp. -Progress Report No. 1.

22.2.2 *HAZEN RESEARCH REPORTS*

Jan 30, 1987; Hazen Research Inc. Project No. 6458, Progress Report No. 1. Processing of Thor Lake 'D Zone' Beryllium and Yttrium Concentrates. 36 p. and 5 appendices.

May 18, 1987; Hazen Research Inc. Project No. 6458, Progress Report No. 2. Processing of Thor Lake 'D Zone' Beryllium and Yttrium Concentrates. 39 p. and 3 appendices.

June 15, 1987; Hazen Research Inc. Project No. 6458, Progress Report No. 3. Processing of Thor Lake 'D Zone' Beryllium Concentrates. 36 p. and 1 appendix.

Dec 1 1, 1987; John E. Litz, Hazen Research Inc. Project No. 6458, Summary Report. Processing of Thor Lake Beryllium and Yttrium Concentrates. 107 p.

Jan 20, 1988; Hazen Research Inc. Project No. 6944. Bench Scale Production of Basic Beryllium Carbonate from the E Zone. 15 p.

22.2.3 WITTECK DEVELOPMENT INC. REPORTS

Dec 17, 1984; D. Newman, A. Mai, M.K. Witte, Witteck Development Inc. Project No. 5119. Phase I Test Work on Highwood Ores, Volume I, Metallurgical Study.

Dec 20, 1984; G. Davison, Witteck Development Inc. Project No. 5119. Phase I Test Work on Highwood Ores, Volume II.

Feb 5, 1985; Witteck Development Inc. Project No. 5119. Phase II Test Work on Highwood Ores, January Monthly Summary.

March 5, 1985; Witteck Deveiopment Inc. Project No. 5119. Phase II Test Work on Highwood Ores, February Monthly Summary.

April 26, 1985; Witteck Development Inc. Project No. 5119. Phase II Test Work on Highwood Ores, March Monthly Summary.

April 29,1985; G,Davison, Witteck Development Inc. Project No. 5119 Phase II Test Work on Highwood Ores, Mineralogical Studies.

June 3, 1985; Witteck Development Inc. Project 5119 Phase II Test Work on Highwood Ores, April/May Monthly Summary.

July 8, 1985; Witteck Development Inc. Project No. 5119 Phase II Test Work on Highwood Ores, June Monthly Summary.

August, 1985; D. Newman, Witteck Development Inc. Project 5119 Phase II Test Work on Highwood Ores, July Monthly Summary.

September 9,1985; D. Newman, Witteck Development Inc. Project 5119 Phase II Test Work on Highwood Ores, August Monthly Summary.

October 8, 1985; D. Newman, Witteck Development Inc. Project 5119 Phase II Test Work on Highwood Ores, September Monthly Summary.

October 17, 1985; D. Newman, Witteck Development Inc. Project 5119 Flotation of Yttrium from Delta-Charlie Zone, Thor Lake Ore.

March 11, 1986; M.K Witte, Witteck Development Inc. Project 5119. Summary of Test Work on Highwood Ores.

22.2.4 MINERAL BENEFICIATION LABORATORY – ARC REPORTS

February 7, 1985; Mineral Beneficiation Laboratory, Alberta Research Council Test on Beryllium Recovery, Final Report.

February 7, 1985; Mineral Beneficiation Laboratory, Alberta Research Council Tests on Magnetite-Tantalum-Columbite Oil Phase Separation, Final Report.

February 7, 1985; Mineral Beneficiation Laboratory, Alberta Research Council Oil Phase Extraction of Columbite, Final Report.

May 31, 1985; Mineral Beneficiation Laboratory, Alberta Research Council Thor Lake Drill Core Sample Preparation.

August 12, 1985; Mineral Beneficiation Laboratory, Alberta Research Council Test for Ionic Interferences with the Oil Phase Extraction of Columbite from Quartz, Albite, Magnetite, and Biotite.

September 18, 1985; Mineral Beneficiation Laboratory, Alberta Research Council Sample Preparation and Oil Phase Extraction on Thor Lake Ore.

December, 1985; Chris Mills The Recovery of Tantalocolumbite from Thor Lake Ores by Oil Phase Extraction, Test Work 1984-1985, Volume I.

22.2.5 *Other Metallurgical Reports*

July 31, 1989; Anh Mai, Hecla Mining Co. Chemical Pilot Plant Campaign on Thor Lake Concentrate. Summary Report. Volume 1 of 2, 75p.

July 31, 1989; Anh Mai, Hecla Mining Co. Chemical Pilot Plant Campaign on Thor Lake Concentrate. Summary Report. Volume 2 of 2.

August, 2000; Dynatec Corporation, Metallurgical Technologies Division Beryllium Recovery -Mineral Processing Plant and Chemical Processing Plant.

August, 2000; Dynatec Corporation, Metallurgical Technologies Division Technical Audit of Process Flowsheet for Treatment of Thor Lake (Phenacite) Concentrate.

22.3 Marketing References

Feb 11, 1987; Kline and Co. Inc. Management Report: A Market Evaluation for Beryllium Hydroxide and Beryllium Oxide. Volume 1, 98p.

March 23, 1987; Kline and Company Inc. Management Report: A Market Evaluation for Beryllium Hydroxide and Beryllium Oxide. Volume 2, 73p.

Oct 1987; Charles River Associates Inc. Report No. 269 The Beryllium Copper Products Industry in the US and Western Europe. Volume 1, 91p.

Oct 1987; Charles River Associates Inc. Report No. 269 Non-Communist Word Beryllium Alloy Markets: 1986-2000, Final Report. ,Volume 2, 51p.

May 1988; Charles River Associates Inc. Report No. 269-02. Preliminary Assessment of the Market for Beryllium Metal and Beryllium Oxide.

May 18, 2000; Kline and Company Inc. Opportunities in Beryllium -Beryllium-Copper Master Alloy Industry Overview.

October, 2006; Sinton, C. W., Rare Earths: Worldwide Markets, Applications, Technologies, BCC Research.

September 2006; Harrower, M., Mining & Chemical Products Ltd., text of a presentation at Minor Metals & Rare Earths 2006 Conference, Beijing, PRC.

22.4 ENVIRONMENTAL AND PERMITTING REFERENCES

June 1997; Golder Associates Ltd. Tailings Facility Siting Study at Hay River for Thor Lake Project.

July 9, 1997; Highwood Resources Ltd. Thor Lake Development Project -Project Description and Environmental Assessment.

December, 1997; Golder Associates Ltd Thor Lake Project Site Investigation Program -Proposed Plant and Tailings Site -Hay River, NWT.

December, 1997; Golder Associates Ltd. Thor Lake Development Project. Evaluation of Environmental lmpacts and Mitigation Strategies.

December, 1997; Shepherd Miller Inc. Thor Lake Demonstration Project -Radiation Issues.

March, 1998; Golder Associates Ltd Thor Lake Project Site Investigation Program -Proposed Plant and Tailings Site -Hay River, NWT.

May, 1998; Golder Associates Ltd. Thor Lake Demonstration Project -Tailings Management Facility Design -Hay River, NWT.

August, 1998; Shepherd Miller Inc. Thor Lake Demonstration Project -Radiation lssues.

October, 1998; Highwood Resources Ltd Thor Lake Development Project - Environmental Assessment Report.

December, 1998; Golder Associates Ltd. An Environmental Survey of the Thor Lake Area.

March, 1999; Highwood Resources Ltd Thor Lake Development Project -Community Consultation Report.

July, 2000; Jacques Whitford Environmental Ltd. Regulatory Process and Environmental Data Assessment -Thor Lake, NWT.

October 2003; Jacques Whitford Environmental Ltd Regulatory Process, Thor Lake Project, NWT -Update.

22.5 OTHER REFERENCES

Jan 1987; Eugene H. Lindsey Thor Lake Project, Ore Reserves and Further Exploration. 32 p. with appendices and maps.

October, 1987; Strathcona Mineral Services Ltd. Thor Lake Project Conceptual Design and Order of Magnitude Cost Estimates. 113 p. and 3 appendices.

July 1988; Morrison Knudsen Engineers Inc. Thor Lake Beryllium Project: Chemical Plant Siting Study. 26 p. and 4 appendices.

Feb 1990; Hecia Mining Company Thor Lake Beryllium Project, Final Report. 16 p., 25 appendices.

23.0 CERTIFICATES OF QUALIFIED PERSON

23.1 CHRISTOPHER MORETON, PH.D., P.GEO.

I, Christopher Moreton, of Oakville, Ontario, do hereby make the following statements regarding this **Thor Lake – Lake Zone Mineral Resource Update,** dated March 30th, 2009:

- At the time of the site visit I was a Senior Geologist with Wardrop Engineering Inc. with a business address at 330 Bay Street, Suite 900, Toronto, Ontario, M5H 2S8.
- I am a graduate of the University of New Brunswick, (Ph.D., 1994), Memorial University of Newfoundland (1984) and the University of Southampton (1981).
- I am a member in good standing of the Association of Professional Engineers and Geoscientists of New Brunswick (License # M5484) and the Association of Professional Geoscientists of Ontario (License # 1229).
- I have practiced my profession continuously since graduation.
- 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 purpose of NI 43-101.
- My relevant experience with respect to these deposits includes more than 20 years researching and exploring deposit types for both senior and junior companies.
- I am responsible for the site visit portion of the report titled **Thor Lake – Lake Zone Mineral Resource Update,** dated March 30th, 2009.
- I visited the Property between April 21st and 23rd, 2008.
- I have no prior involvement with the Property that is the subject of the Technical Report.
- I am independent of the Issuer as defined by Section 1.4 of the Instrument.

Signed and dated this 23rd day of March, 2009 at Toronto, Ontario.

"Original document, revision 01, signed and stamped by Christopher Moreton, Ph.D., P.Geo."

Signature

23.2 JOANNE PAUL, P. GEO.

I, Joanne Paul, of Toronto, Ontario, do hereby certify that as co-author of this **Thor Lake – Lake Zone Mineral Resource Update** dated March 30th 2009, I hereby make the following statements:

- I am a Senior Geologist with Wardrop Engineering Inc. with the business address at 330 Bay Street, Suite 900, Toronto, ON, M5H 2S8.
- I am a graduate of University of Waterloo, Ontario, Canada, with a B.Sc. in Geology.
- I am a member in good standing of the Association of Professional Geoscientists of Ontario (Registration #0819).
- I have practiced my profession in geology continuously since graduation.
- 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 purpose of NI 43-101.
- My relevant experience with respect to the Thor Lake Project is based upon over 10 years of experience in geological modeling. I have not made a site visit to the Property.
- I was involved in the preparation of Sections 1.0 to 15.0 of this technical report titled **Thor Lake – Lake Zone Mineral Resource Update** dated March 30th 2009.
- I have no prior involvement with the Property that is the subject of the Technical Report.
- As of the date of this Certificate, to my knowledge, information and belief, this Technical Report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.
- I am independent of the Issuer applying the tests set out in Section 1.4 of National Instrument 43-101.
- I have read National Instrument 43-101 and the Technical Report has been prepared in compliance with National Instrument 43-101 and Form 43-101F1.

Signed and dated this 30th day of March, 2009 at Toronto, Ontario.

"Original document, revision 01, signed and stamped by Joanne Paul, P.Geo."

Signature

23.3 THOMAS C. STUBENS, M.A.SC., P.ENG.

I, Thomas C. Stubens, of Vancouver, British Columbia, do hereby certify that as co-author of this **Thor Lake – Lake Zone Mineral Resource Update** dated March 30th, 2009, I hereby make the following statements:

- I am a Senior Geologist with Wardrop Engineering Inc. with a business address at 800-555 West Hastings St., Vancouver, British Columbia, V6B 1M1.
- I am a graduate of the Universities of Toronto and British Columbia, (B.A.Sc, 1978 and M.A.Sc., 1989 respectively).
- I am a member in good standing of the Association of Professional Engineers and Geoscientists of British Columbia (License #28367).
- I have practiced my profession continuously since graduation.
- 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 purpose of NI 43-101.
- My relevant experience with respect to the Thor Lake Project is based on over 20 years experience in geological modelling, geostatistics and mineral resource estimation. I have not made a site visit to the Property.
- I am responsible for the preparation of all Sections except for Section 16 of this technical report titled **Thor Lake – Lake Zone Mineral Resource Update** dated March 30th, 2009.
- I have no prior involvement with the Property that is the subject of the Technical Report.
- As of the date of this Certificate, to my knowledge, information, and belief, this Technical Report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.
- I am independent of the Issuer as defined by Section 1.4 of the Instrument.
- I have read National Instrument 43-101 and the Technical Report has been prepared in compliance with National Instrument 43-101 and Form 43-101F1.

Signed and dated this 30th day of March, 2009 at Vancouver, British Columbia.

"Original document, revision 01, signed and stamped by Thomas C. Stubens, M.A.Sc., P.Eng."

Signature

APPENDIX A

2007/2008 Drill Hole Summary

Header Survey Table

L08-110	416835.88	6886607.25	238.31	216.85	0	-90
L08-111	416838.11	6886504.80	244.41	201.30	0	-90
L08-112	416819.13	6886346.09	242.61	198.25	0	-90
L08-113	416834.03	6886219.05	244.02	198.25	0	-90
L08-114	416936.60	6886222.89	243.35	192.15	0	-90
L08-115	416830.61	6886155.59	243.58	198.25	0	-90
L08-116	416949.46	6886099.84	244.19	198.25	0	-90
L08-117	417103.88	6886023.47	243.18	205.10	0	-90
L08-118	417524.01	6886305.33	241.84	216.55	0	-90
L08-119	417533.72	6886529.65	246.16	198.25	0	-90
L08-120	417532.07	6886672.42	243.10	198.25	0	-90
L08-121	417551.63	6887152.66	241.29	198.25	0	-90
L08-122	417465.00	6887345.00	242.88	21.40	0	-90
L08-122A	417476.97	6887283.06	242.88	109.80	0	-90
L08-123	417404.22	6886674.93	238.46	207.40	0	-90
L08-124	417400.08	6886571.71	241.59	198.25	0	-90
L08-125	417399.89	6886424.66	242.76	195.20	0	-90
L08-126	417284.35	6886505.92	241.13	204.35	0	-90
L08-127	417235.41	6886671.67	238.04	201.30	0	-90
L08-128	417228.73	6885963.61	240.28	213.50	0	-90
L08-129	416952.15	6885961.29	240.54	213.50	0	-90
L08-130	416518.77	6886370.61	246.04	198.25	0	-90
L08-131	416363.17	6886229.11	249.78	244.00	0	-90
L08-132	416206.90	6886217.58	247.10	261.65	0	-90
L08-133	416200.00	6886375.00	238.50	64.05	0	-90
L08-134	415993.89	6886376.58	242.31	231.80	0	-90
L08-135	416000.22	6886531.74	248.52	210.45	0	-90
L08-136	417983.00	6887313.00	257.50	368.80	0	-90

APPENDIX B

STANDARD CERTIFICATES

SMEE & ASSOCIATES CONSULTING LTD.
CONSULTING GEOCHEMISTRY / GEOLOGY

Certificate of Analysis

Avalon Ventures Standard AVL-H

Element	Certified Mean	Two Standard Deviations (between lab)
Y	2739 ppm	163 ppm
Nb	2858 ppm	267 ppm
Hf	416 ppm	38 ppm
Zr	18650 ppm	1560 ppm
La	2568 ppm	261 ppm
Ce	6189 ppm	616 ppm
Pr	768 ppm	53 ppm
Nd	3038 ppm	208 ppm
Sm	589 ppm	59 ppm
Eu	72.8 ppm	6.1 ppm
Dy	569 ppm	38 ppm
Ho	100 ppm	9.6 ppm
Tm	27.4 ppm	1.4 ppm
Yb	143 ppm	6.3 ppm
Lu	17.7 ppm	1.1 ppm

Element	Provisional Mean	Two Standard Deviations (between lab)
Ta	303 ppm	46 ppm
Th	251 ppm	31 ppm
Gd	586 ppm	67 ppm
Ga	134 ppm	34 ppm
Tb	106 ppm	10.4 ppm
Er	233 ppm	26.6 ppm

Means and standard deviations were calculated from data supplied by five laboratories. Instructions to the laboratories were for the laboratory to analyze the major and REE elements by fusion ICP-MS/ES combination.

Smee and Associates Consulting Ltd.
4658 Capilano Rd. North Vancouver, B.C., Canada, V7R 4K3
Tel: 604-929-0667; Fax: 604-929-0662
e-mail: bwsmee@geochemist.com
web site: www.geochemist.com

The participating laboratories were:

ALS Chemex, Vancouver
Acme, Vancouver
Actlabs, Ancaster
SGS, Toronto
Geolabs, Sudbury

The final limits were calculated after first determining if all data was compatible within a spread normally expected for similar analytical methods done by reputable laboratories. Data from any one laboratory was removed from further calculations when the mean of all analyses from that laboratory failed a t test of the global means of the other laboratories. The means and standard deviations were calculated using all remaining data. Any analysis that fell outside of the mean $\pm$ 2 standard deviations was removed from the ensuing data base as a “flier”. The mean and standard deviations were again calculated using the remaining data (shown as the 1st Iteration in the attached Excel spreadsheets). The standard deviation values are known as the “Between Lab” deviations, and can be used to monitor accuracy of a single analysis.

Elements are certified if the Relative Standard Deviation (RSD) is near 5 % or less. Elements that have a RSD of between 5 % and 15 % are given a Provisional mean and elements that have a RSD of more than 15 %, or have insufficient data are not certified but given an Indicated Mean.

The bulk standards were prepared and packaged by CDN Labs of Delta B.C. Each bulk sample was pulverized in a large rod mill, screened through 200 mesh using an electric sieve, and homogenized in a large rotating mixer.

BW Smee

Barry W. Smee, Ph.D., P.Geo.

Smee and Associates Consulting Ltd.
4658 Capilano Rd. North Vancouver, B.C., Canada, V7R 4K3
Tel: 604-929-0667; Fax: 604-929-0662
e-mail: bwsmee@geochemist.com
web site: www.geochemist.com

SMEE & ASSOCIATES CONSULTING LTD.
CONSULTING GEOCHEMISTRY / GEOLOGY

Certificate of Analysis

Avalon Ventures Standard AVL-L

Element	Certified Mean	Two Standard Deviations (between lab)
Nb	1394 ppm	150 ppm
Ta	146 ppm	15.2 ppm
Zr	9885 ppm	850 ppm
Th	68.6 ppm	6.8 ppm
La	1020 ppm	95 ppm
Ce	2309 ppm	183 ppm
Pr	299 ppm	16.5 ppm
Nd	1140 ppm	52 ppm
Sm	230 ppm	26 ppm
Gd	200 ppm	21.7 ppm
Tb	28.5 ppm	2.4 ppm
Dy	138 ppm	14 ppm
Tm	7.07 ppm	0.50 ppm
Yb	41.6 ppm	2.4 ppm
Lu	5.5 ppm	0.34 ppm

Element	Provisional Mean	Two Standard Deviations (between lab)
Y	641 ppm	84 ppm
Hf	231 ppm	33 ppm
Eu	25.7 ppm	3.2 ppm
Ga	110 ppm	21 ppm
Ho	24.3 ppm	3.1 ppm
Er	55.6 ppm	8.1 ppm

Means and standard deviations were calculated from data supplied by five laboratories. Instructions to the laboratories were for the laboratory to analyze the major and REE elements by fusion ICP-MS/ES combination.

Smee and Associates Consulting Ltd.
4658 Capilano Rd. North Vancouver, B.C., Canada, V7R 4K3
Tel: 604-929-0667; Fax: 604-929-0662
e-mail: bwsmee@geochemist.com
web site: www.geochemist.com

The participating laboratories were:

ALS Chemex, Vancouver
Acme, Vancouver
Actlabs, Ancaster
SGS, Toronto
Geolabs, Sudbury

The final limits were calculated after first determining if all data was compatible within a spread normally expected for similar analytical methods done by reputable laboratories. Data from any one laboratory was removed from further calculations when the mean of all analyses from that laboratory failed a t test of the global means of the other laboratories. The means and standard deviations were calculated using all remaining data. Any analysis that fell outside of the mean $\pm$ 2 standard deviations was removed from the ensuing data base as a “flier”. The mean and standard deviations were again calculated using the remaining data (shown as the 1st Iteration in the attached Excel spreadsheets). The standard deviation values are known as the “Between Lab” deviations, and can be used to monitor accuracy of a single analysis.

Elements are certified if the Relative Standard Deviation (RSD) is near 5 % or less. Elements that have a RSD of between 5 % and 15 % are given a Provisional mean and elements that have a RSD of more than 15 %, or have insufficient data are not certified but given an Indicated Mean.

The bulk standards were prepared and packaged by CDN Labs of Delta B.C. Each bulk sample was pulverized in a large rod mill, screened through 200 mesh using an electric sieve, and homogenized in a large rotating mixer.

Barry W. Smee, Ph.D., P.Geo.

Smee and Associates Consulting Ltd.
4658 Capilano Rd. North Vancouver, B.C., Canada, V7R 4K3
Tel: 604-929-0667; Fax: 604-929-0662
e-mail: bwsmee@geochemist.com
web site: www.geochemist.com

Certificate of Analysis

Avalon Ventures Standard AVL-M

Element	Certified Mean	Two Standard Deviations (between lab)
Nb	2230 ppm	225 ppm
Hf	366 ppm	37 ppm
Ta	229 ppm	24 ppm
Zr	16082 ppm	1740 ppm
Th	137 ppm	15.2 ppm
La	1735 ppm	107 ppm
Ce	3859 ppm	131 ppm
Pr	491 ppm	29 ppm
Nd	1858 ppm	115 ppm
Eu	40 ppm	3.5 ppm
Tb	43.1 ppm	2.2 ppm
Dy	203 ppm	21 ppm
Ho	35.8 ppm	2.2 ppm
Tm	10.0 ppm	1.1 ppm
Yb	59.3 ppm	4.4 ppm
Lu	8.0 ppm	0.7 ppm

Element	Provisional Mean	Two Standard Deviations (between lab)
Y	918 ppm	136 ppm
Sm	354 ppm	41 ppm
Gd	315 ppm	47 ppm
Ga	154 ppm	36.6 ppm
Er	79.5 ppm	11.8 ppm

Means and standard deviations were calculated from data supplied by five laboratories. Instructions to the laboratories were for the laboratory to analyze the major and REE elements by fusion ICP-MS/ES combination.

Smee and Associates Consulting Ltd.
4658 Capilano Rd. North Vancouver, B.C., Canada, V7R 4K3
Tel: 604-929-0667; Fax: 604-929-0662
e-mail: bwsmee@geochemist.com
web site: www.geochemist.com

The participating laboratories were:

ALS Chemex, Vancouver
Acme, Vancouver
Actlabs, Ancaster
SGS, Toronto
Geolabs, Sudbury

The final limits were calculated after first determining if all data was compatible within a spread normally expected for similar analytical methods done by reputable laboratories. Data from any one laboratory was removed from further calculations when the mean of all analyses from that laboratory failed a t test of the global means of the other laboratories. The means and standard deviations were calculated using all remaining data. Any analysis that fell outside of the mean ± 2 standard deviations was removed from the ensuing data base as a "flier". The mean and standard deviations were again calculated using the remaining data (shown as the 1st Iteration in the attached Excel spreadsheets). The standard deviation values are known as the "Between Lab" deviations, and can be used to monitor accuracy of a single analysis.

Elements are certified if the Relative Standard Deviation (RSD) is near 5 % or less. Elements that have a RSD of between 5 % and 15 % are given a Provisional mean and elements that have a RSD of more than 15 %, or have insufficient data are not certified but given an Indicated Mean.

The bulk standards were prepared and packaged by CDN Labs of Delta B.C. Each bulk sample was pulverized in a large rod mill, screened through 200 mesh using an electric sieve, and homogenized in a large rotating mixer.

BW Smee

Barry W. Smee, Ph.D., P.Geo.

Smee and Associates Consulting Ltd.
4658 Capilano Rd. North Vancouver, B.C., Canada, V7R 4K3
Tel: 604-929-0667; Fax: 604-929-0662
e-mail: bwsmee@geochemist.com
web site: www.geochemist.com

SCAN PLEASE
BXP

CDN Resource Laboratories Ltd.

10945-B River Road, Delta, B.C., V4C 2R8 Ph: 604-540-2233 Fax: 604-540-2237

To: Avalon Ventures Ltd.
130 Adelaide Street West, #1901
Toronto, Ontario
M5H 3P5

File No: 280326
Date: March 19, 2008
Proj: Standards

Attn: William Mercer

REPORT ON THE PREPARATION OF ASSAY STANDARD REFERENCE MATERIALS

(STANDARDS LG, MG, HG)

CDN Resource Laboratories Ltd. received a shipment of samples from Avalon Ventures Ltd. This material was used to prepare three homogeneous pulps suitable for use as assay standard reference materials. The three standards were prepared separately and in an identical manner as follows:

1. The sample was dried. The material was mechanically ground in a rod mill and then screened through a 200 mesh sieve. The +200 fraction was discarded.

2. The -200 fraction (<75 micron) was mechanically mixed for 2 days in a V-Blender rotating at approximately 20 rpm.

3. 25 samples of 25g each were split out and sent out for round-robin analysis (5 samples to each of the following laboratories: ALS - Vancouver, Acme - Vancouver, Actlabs - Ontario, SGS-Lakefield and Geosciences Laboratory in Ontario.

4. Results were forwarded to Avalon Ventures Ltd. for tabulation and certification.

5. The standards were bagged in lots of approximately 25g in tin-top kraft bags.

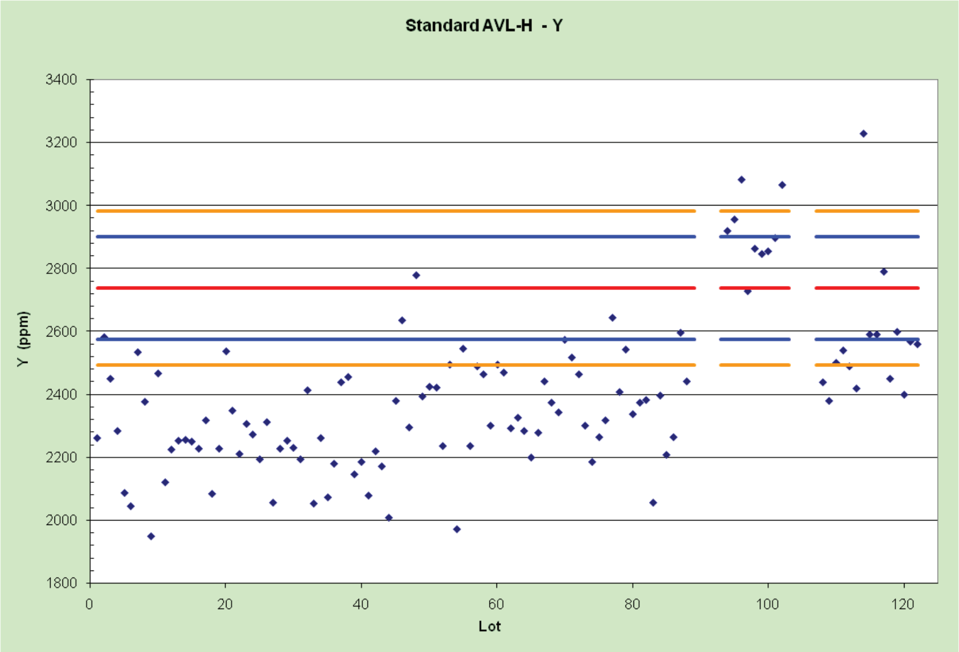
6. The standards were shipped to Avalon Ventures Ltd.

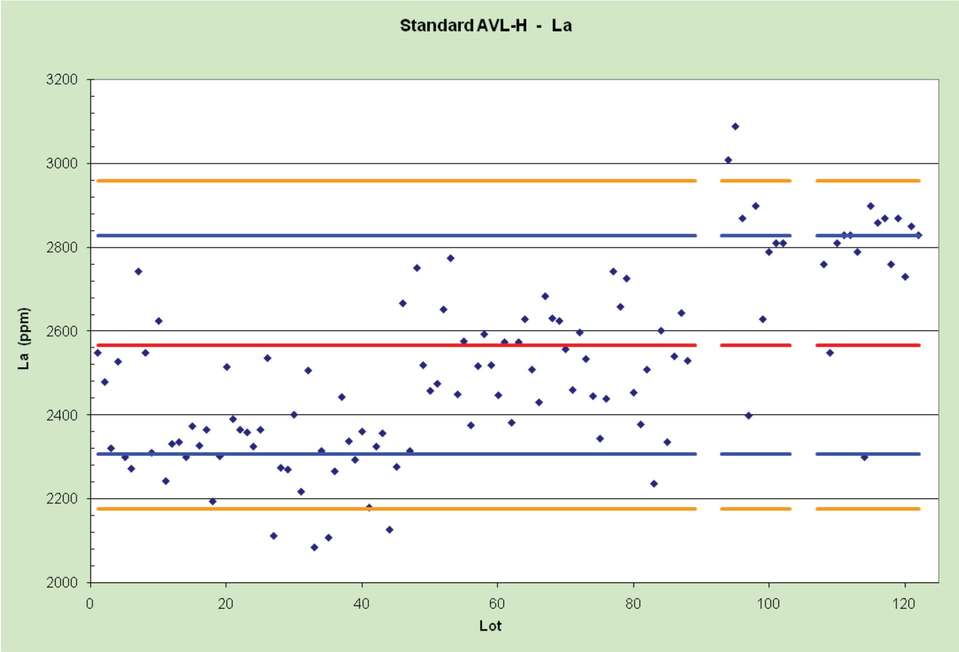
Duncan Sanderson

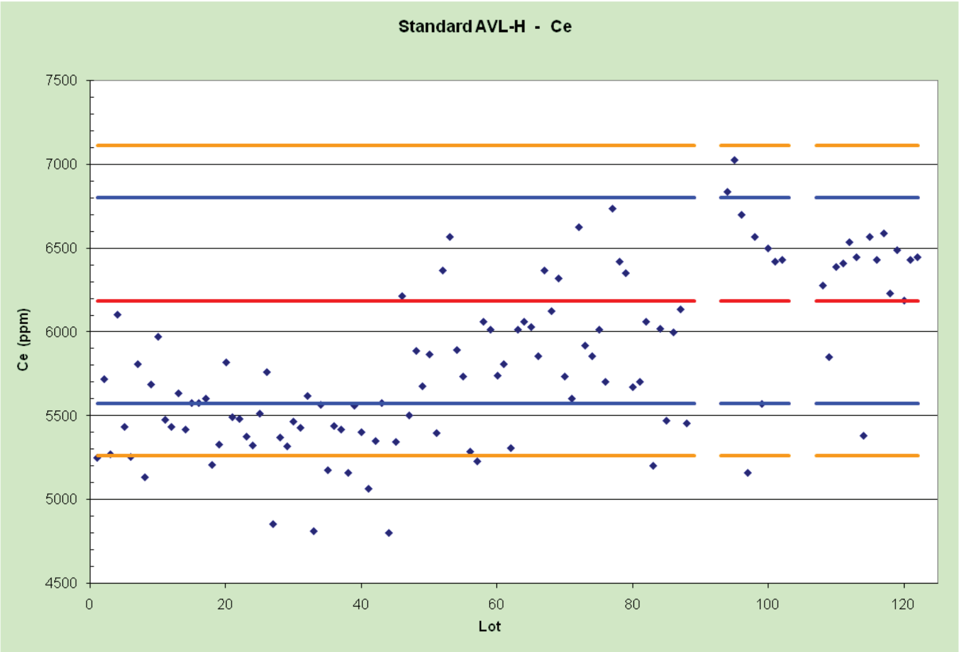
Duncan Sanderson, Certified Assayer of British Columbia

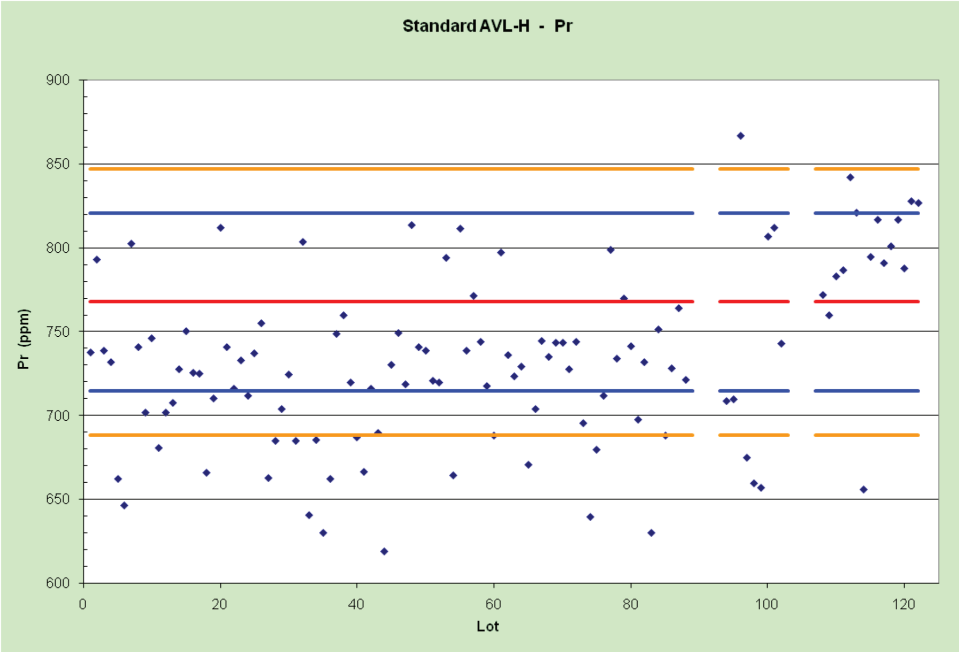
APPENDIX C

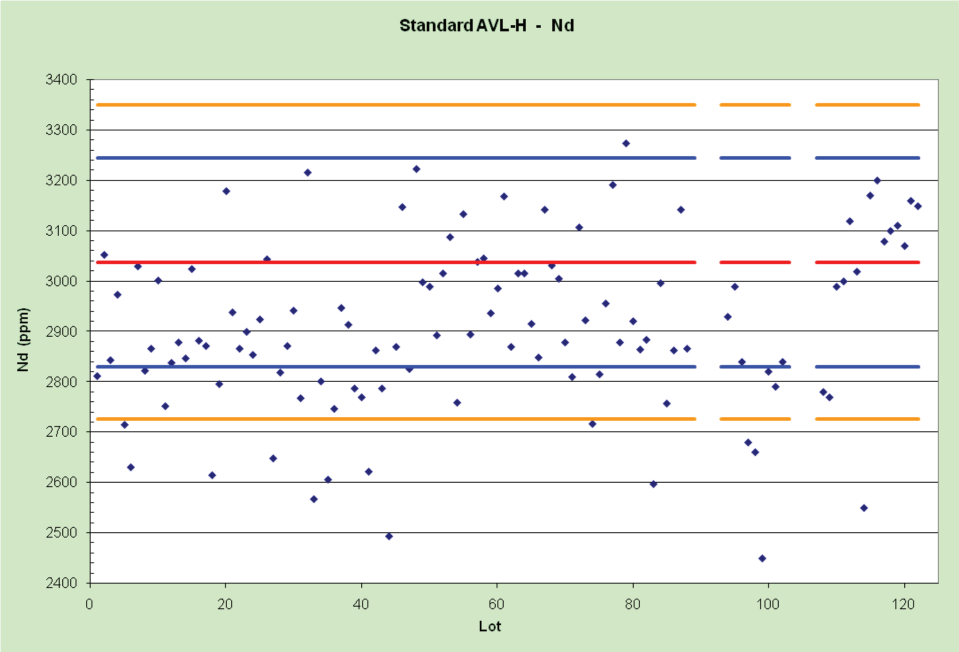
QA/QC RESULTS

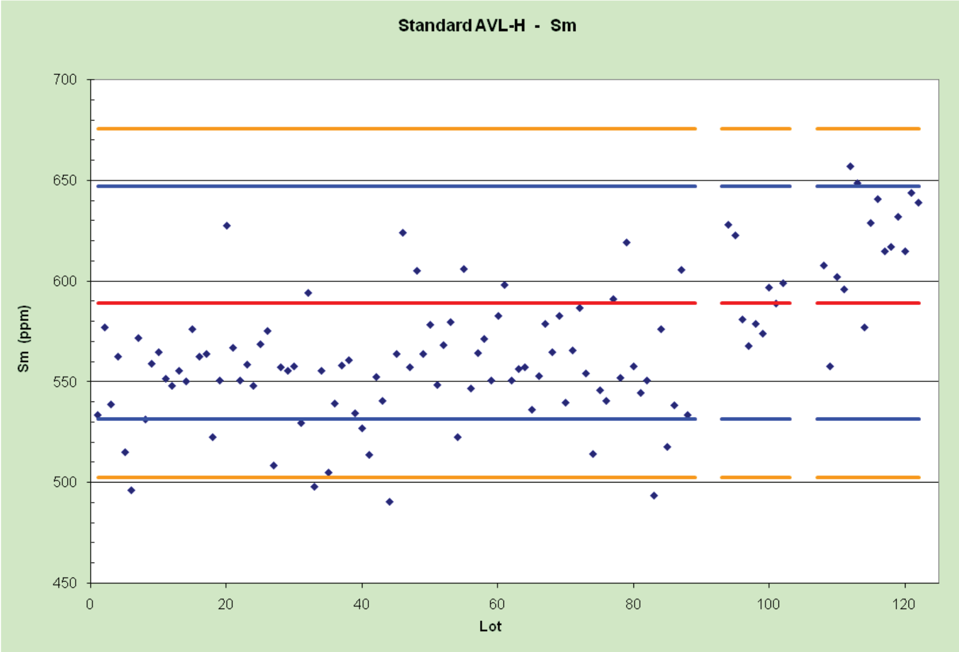

Standard AVL-H - Y
Y (ppm)
Lot

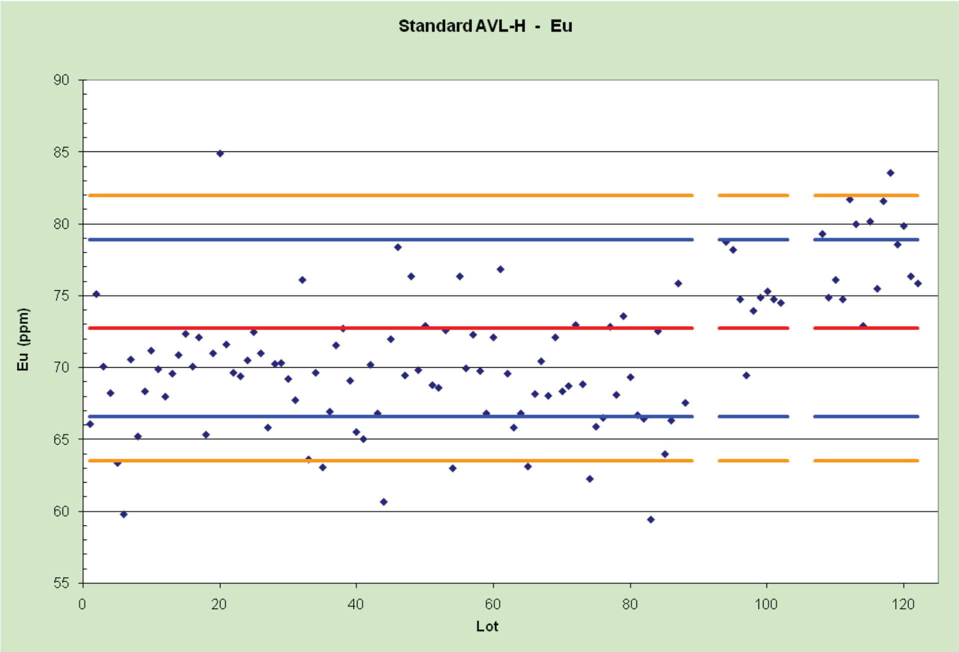

Standard AVL-H - La
La (ppm)
Lot

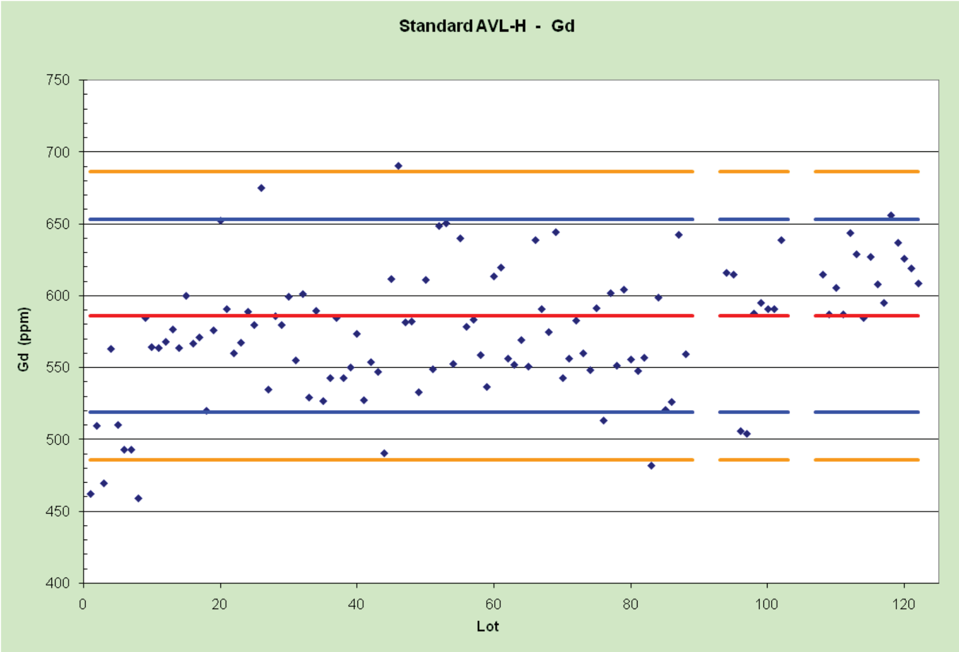

Standard AVL-H - Ce
Ce (ppm)
Lot

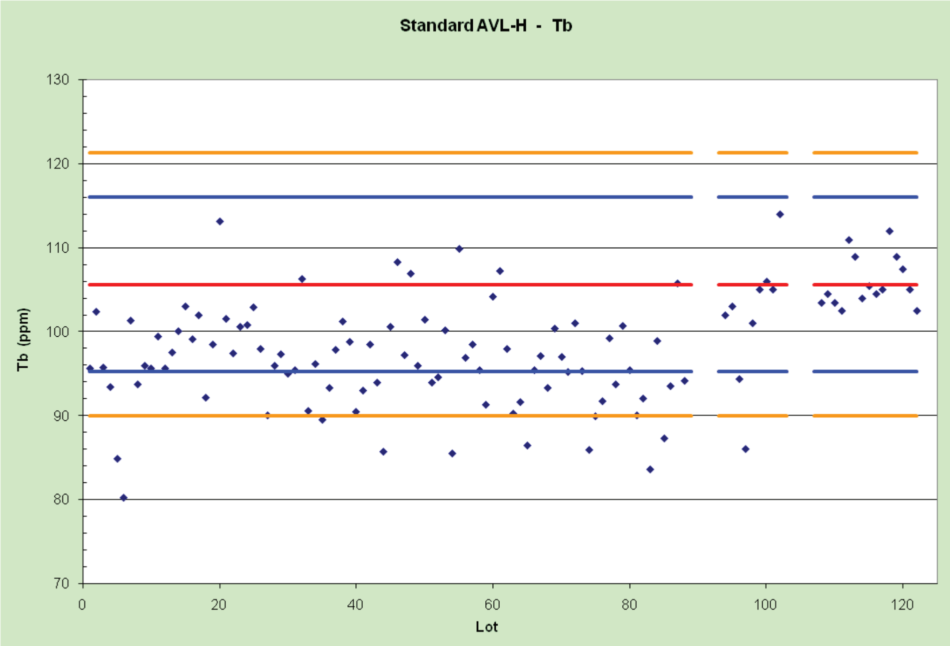

Standard AVL-H - Pr
Pr (ppm)
Lot

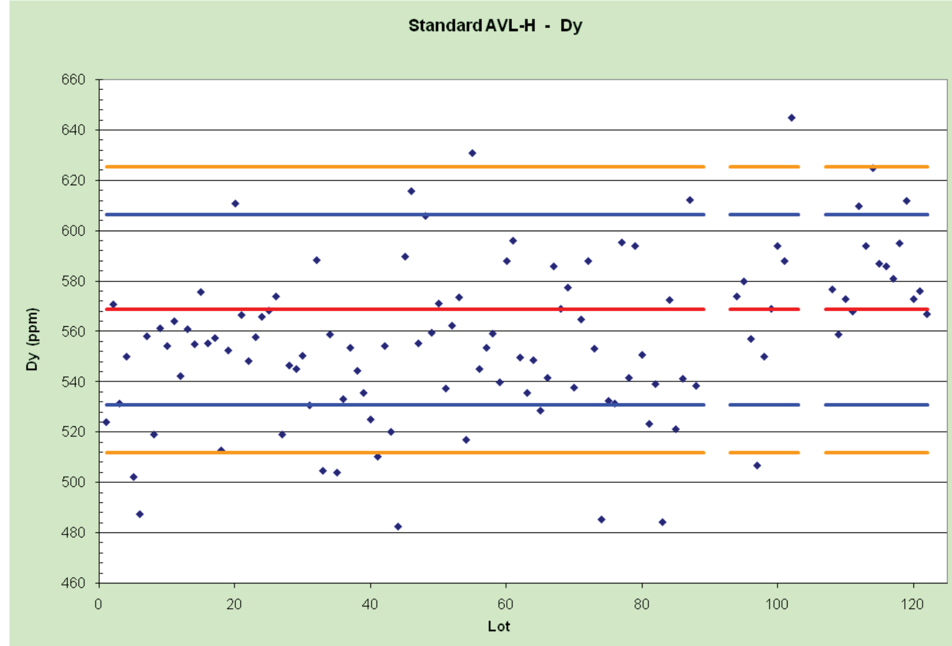

Standard AVL-H - Nd
Nd (ppm)
Lot
3400
3300
3200
3100
3000
2900
2800
2700
2600
2500
2400
0
20
40
60
80
100
120

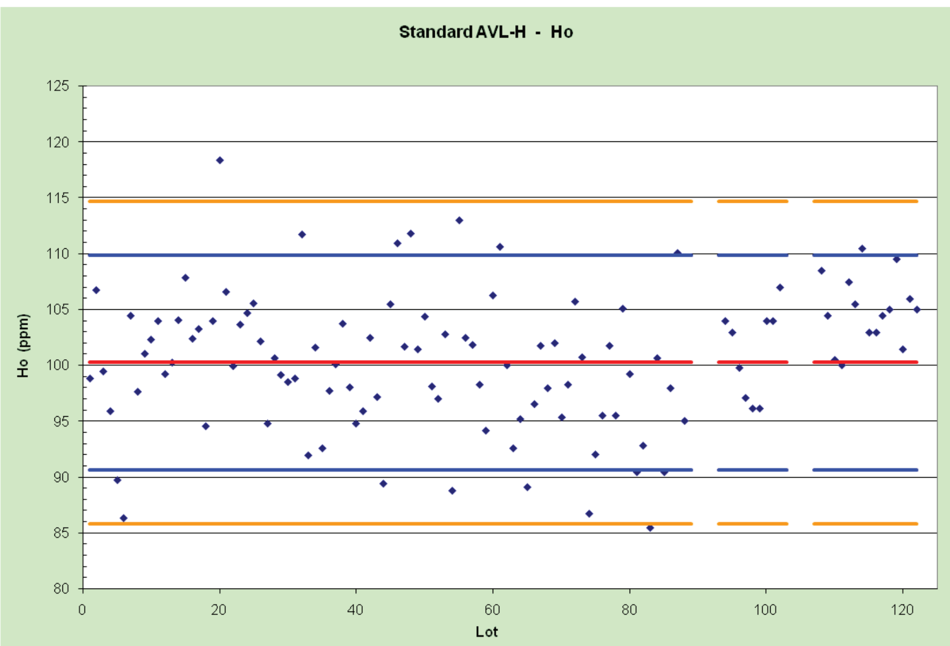

Standard AVL-H - Sm
Sm (ppm)
Lot
700
650
600
550
500
450
0
20
40
60
80
100
120

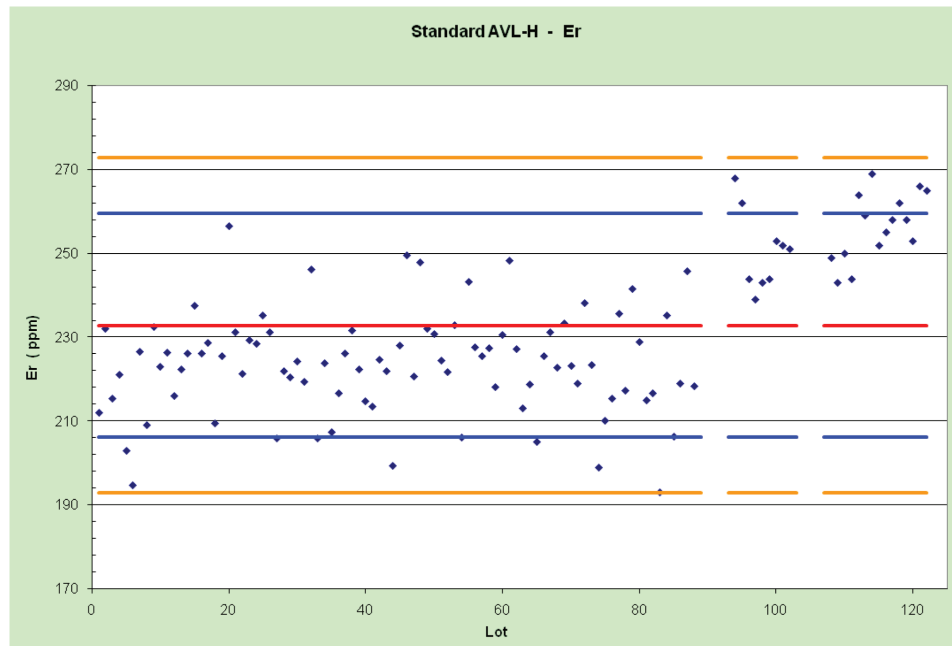

Standard AVL-H - Eu
Eu (ppm)
Lot
90
85
80
75
70
65
60
55
0
20
40
60
80
100
120

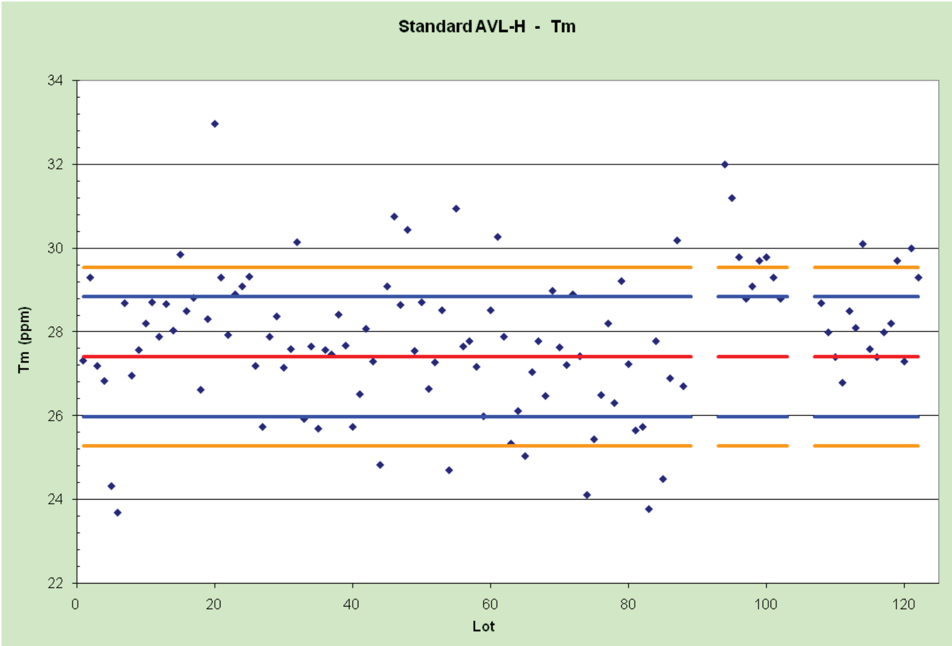

Standard AVL-H - Gd
Gd (ppm)
Lot
750
700
650
600
550
500
450
400
0
20
40
60
80
100
120


Standard AVL-H - Tb
Tb (ppm)
Lot
130
120
110
100
90
80
70
0
20
40
60
80
100
120

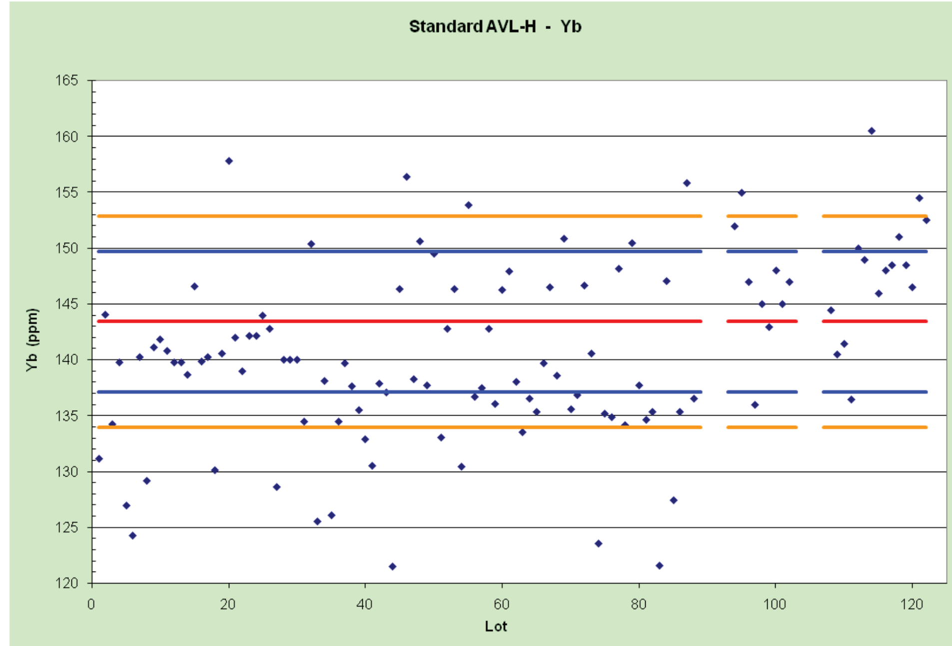

Standard AVL-H - Dy
Dy (ppm)
Lot
660
640
620
600
580
560
540
520
500
480
460
0
20
40
60
80
100
120


Standard AVL-H - Ho
Ho (ppm)
Lot
125
120
115
110
105
100
95
90
85
80
0
20
40
60
80
100
120

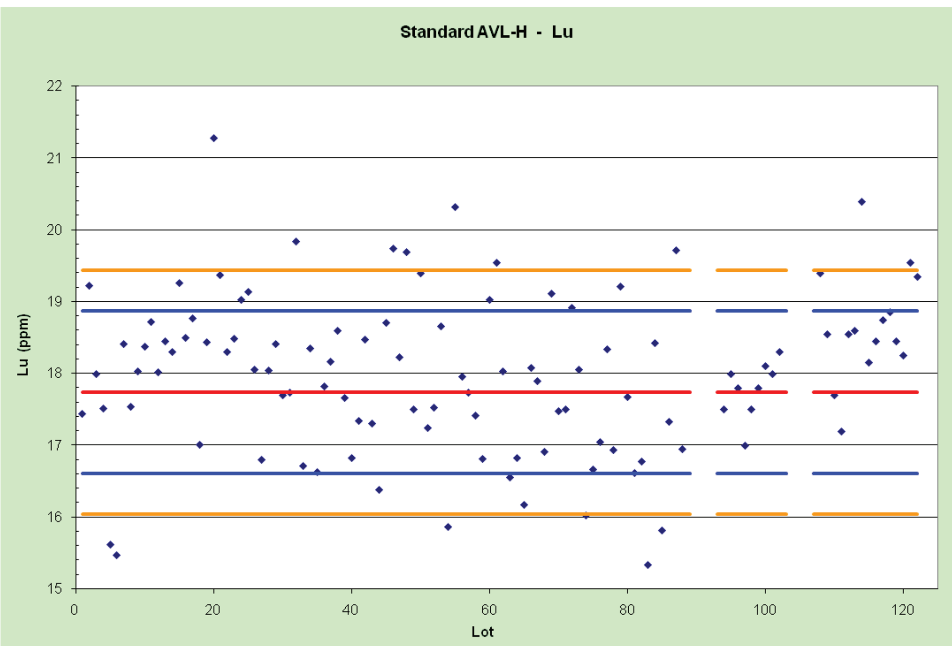

Standard AVL-H - Er
Er (ppm)
Lot
290
270
250
230
210
190
170
0
20
40
60
80
100
120



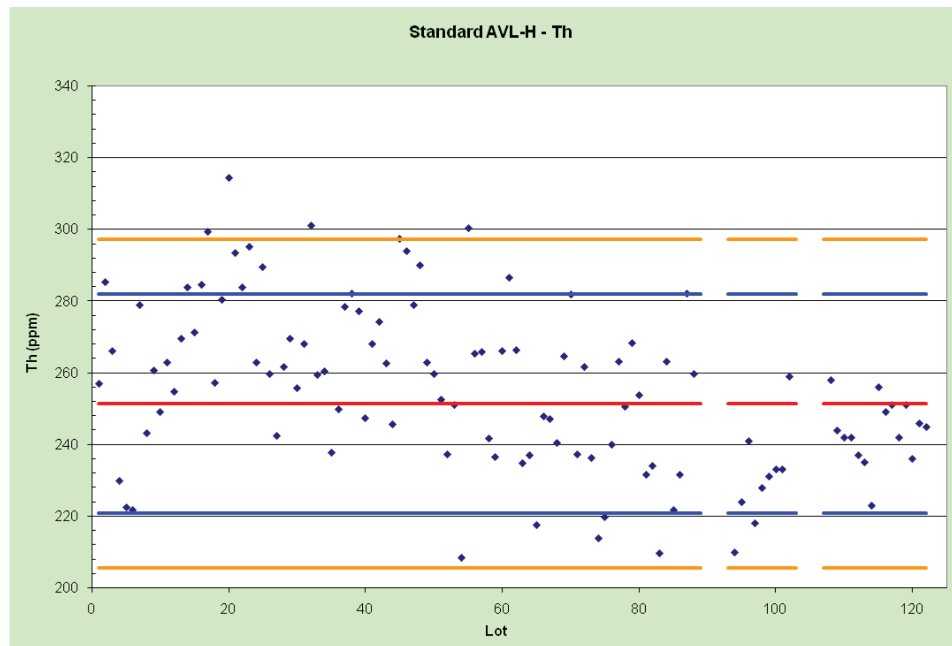
Standard AVL-H - Tm
Tm (ppm)
Lot



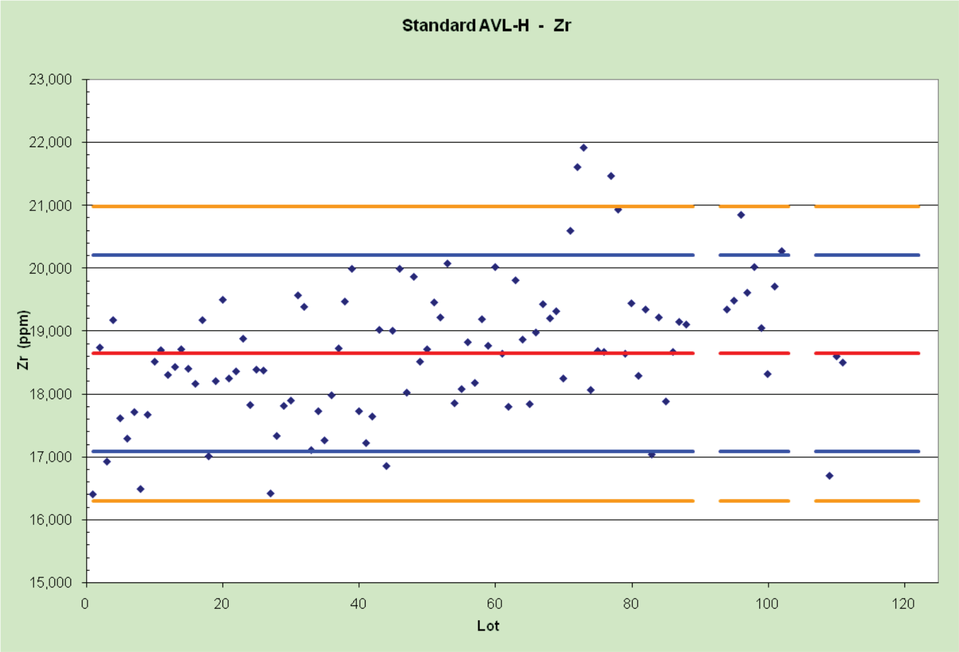
Standard AVL-H - Yb
Yb (ppm)
Lot

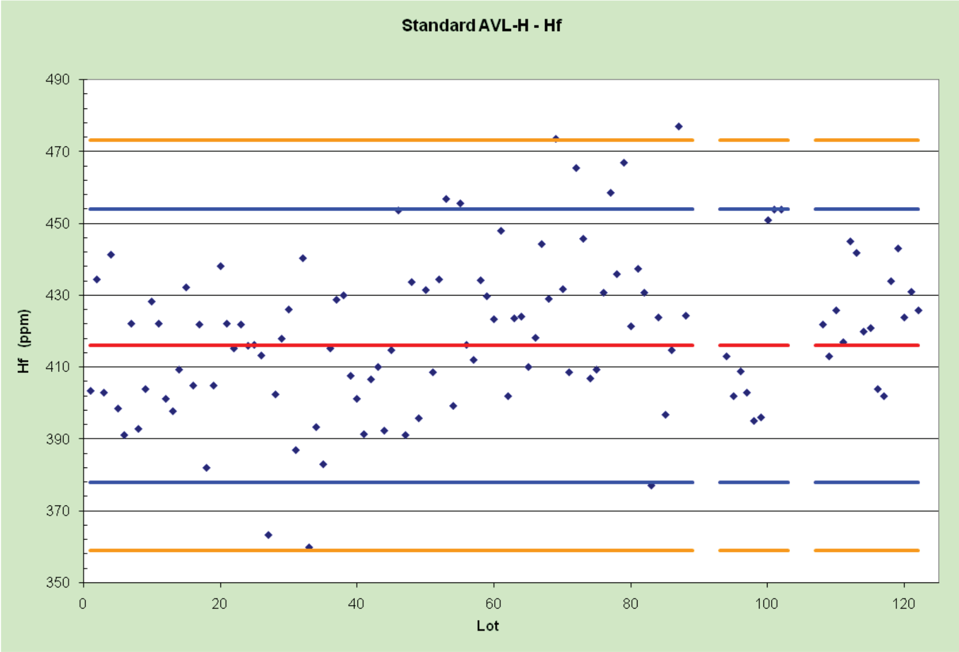


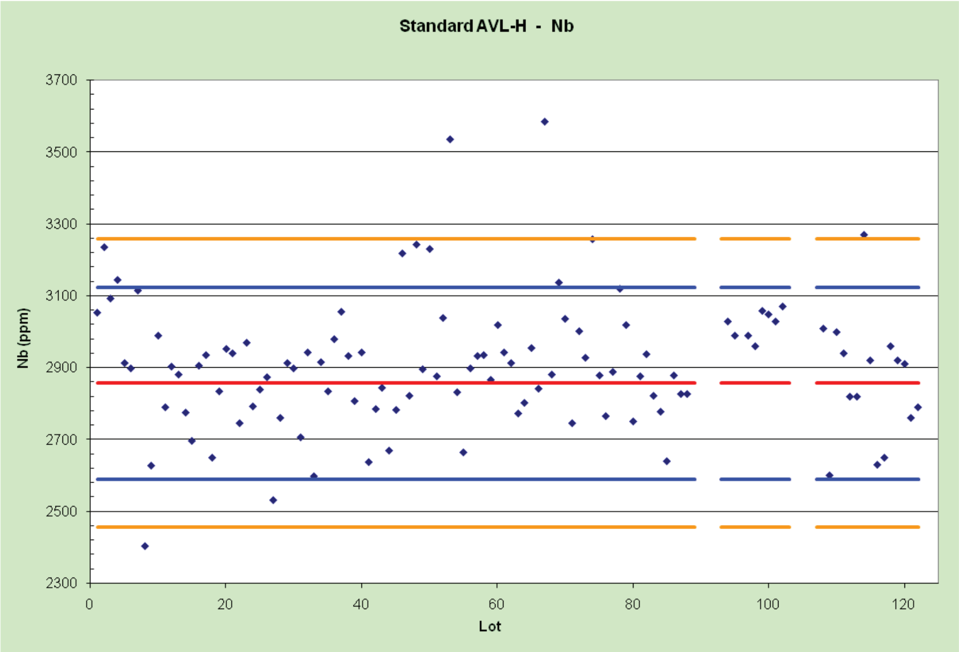
Standard AVL-H - Lu
Lu (ppm)
Lot

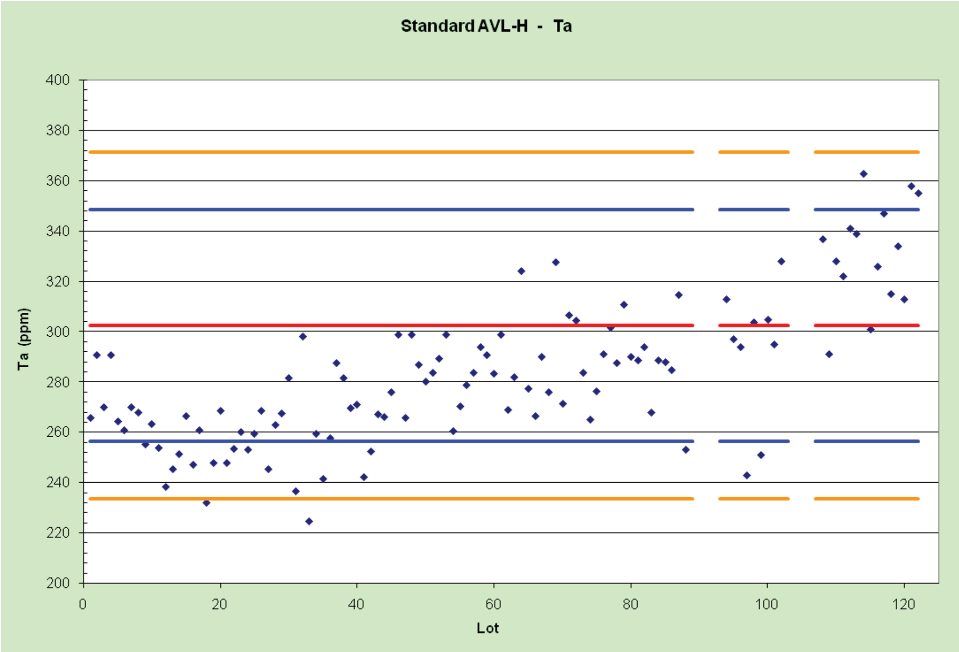


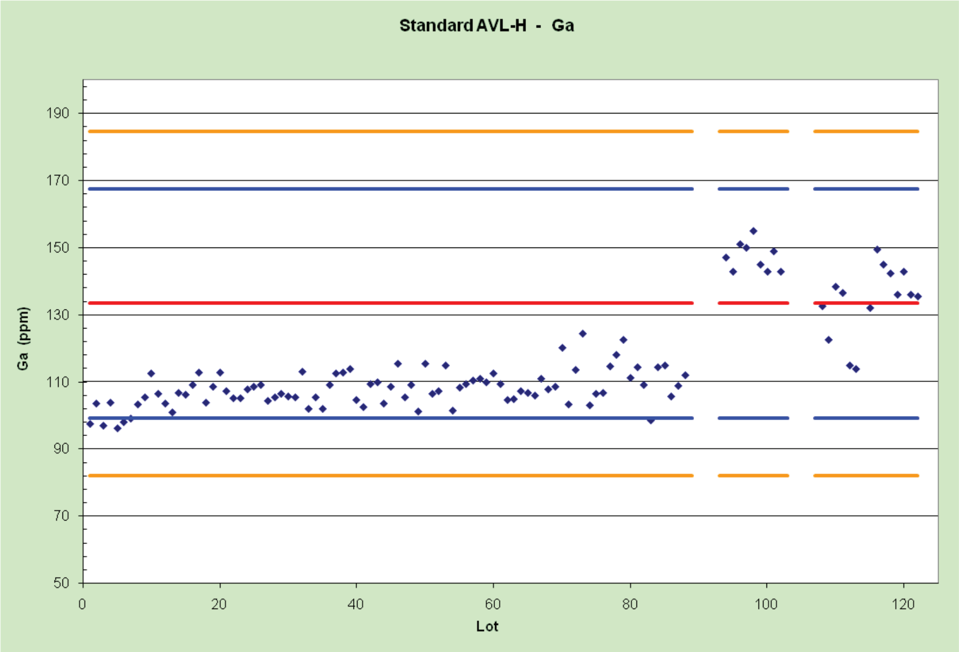
Standard AVL-H - Th
Th (ppm)
Lot


Standard AVL-H - Zr
Zr (ppm)
Lot
23,000
22,000
21,000
20,000
19,000
18,000
17,000
16,000
15,000
0
20
40
60
80
100
120


Standard AVL-H - Hf
Hf (ppm)
Lot
490
470
450
430
410
390
370
350
0
20
40
60
80
100
120


Standard AVL-H - Nb
Nb (ppm)
Lot
3700
3500
3300
3100
2900
2700
2500
2300
0
20
40
60
80
100
120


Standard AVL-H - Ta
Ta (ppm)
Lot
400
380
360
340
320
300
280
260
240
220
200
0
20
40
60
80
100
120



Standard AVL-H - Ga
Ga (ppm)
190
170
150
130
110
90
70
50
0
20
40
60
80
100
120
Lot

STD_cor	Lot #	WO	Samp_id	STD_orig	Date	WT	Y	La	Ce	Pr	Nd	Sm	Eu
AVL-H	1	YKN07000042	684590	AVL-H	20-Dec-07		2261	2550	5251	737.6	2812	533.8	66.07
AVL-H	2	YKN07000036	716700	AVL-H	21-Dec-07		2584	2480	5721	793.3	3053	577.2	75.13
AVL-H	3	YKN07000036	716760	AVL-H	21-Dec-07		2452	2322	5272	739	2844	539	70.11
AVL-H	4	YKN07000043	684803	AVL-H	29-Jan-08		2046	2272	5258	646.7	2631	496.3	59.81
AVL-H	5	YKN07000043	684740	AVL-H	29-Jan-08		2284	2529	6105	731.9	2973	562.8	68.27
AVL-H	6	YKN07000043	684773	AVL-H	29-Jan-08		2088	2300	5437	662.6	2715	515.1	63.4
AVL-H	7	YKN07000039	716820	AVL-H	31-Jan-08		2535	2743	5808	802.9	3030	571.9	70.61
AVL-H	8	YKN07000039	716850	AVL-H	31-Jan-08		2378	2550	5132	741.1	2823	531.3	65.22
AVL-H	9	YKN08000106	793071	AVL-H	10-Apr-08		2467.3	2624.5	5971.8	746.02	3001.8	564.83	71.22
AVL-H	10	YKN08000106	793046	AVL-H	10-Apr-08		1950.6	2311.3	5687.2	701.95	2865.7	559.27	68.39
AVL-H	11	YKN08000114	793700	AVL-H	1-May-08	0.1	2122.3	2242.7	5475.5	680.6	2753	551.88	69.89
AVL-H	12	YKN08000117	793350	AVL-H	2-May-08		2254.6	2336.9	5635.8	707.62	2879.4	555.57	69.61
AVL-H	13	YKN08000117	793325	AVL-H	2-May-08		2226.7	2332.6	5434.2	702.19	2838.2	547.97	68
AVL-H	14	YKN08000115	793450	AVL-H	5-May-08	0.1	2257.1	2300	5420.5	727.83	2847	550.13	70.92
AVL-H	15	YKN08000122	794550	AVL-H	9-May-08	6	2229.3	2327.4	5579.5	725.47	2881.8	562.59	70.12
AVL-H	16	YKN08000122	793900	AVL-H	9-May-08	3.5	2251.1	2373	5577.6	750.52	3024.9	576.36	72.37
AVL-H	17	YKN08000125	794775	AVL-H	22-May-08	0.1	2227.7	2302.4	5329	710.45	2796.1	550.65	70.99
AVL-H	18	YKN08000125	794725	AVL-H	22-May-08	0.1	2085.9	2195.6	5207.4	666.25	2614.6	522.62	65.38
AVL-H	19	YKN08000125	794650	AVL-H	22-May-08	0.1	2318.5	2366	5606.3	724.97	2871.2	564.17	72.14
AVL-H	20	YKN08000132	795200	AVL-H	29-May-08	0.1	2536.9	2516.2	5817.6	812.09	3179.8	627.9	84.94
AVL-H	21	YKN08000132	795250	AVL-H	29-May-08	0.1	2348.7	2391.3	5493.9	740.76	2938.5	566.87	71.63
AVL-H	22	YKN08000132	795425	AVL-H	29-May-08	0.1	2307.4	2359.7	5377.9	732.81	2899	558.86	69.41
AVL-H	23	YKN08000132	795350	AVL-H	29-May-08	0.1	2211.7	2366.2	5484.3	716.2	2865.8	550.63	69.69
AVL-H	24	YKN08000132	795450	AVL-H	29-May-08	4	2272.8	2326.4	5326.3	711.78	2853.9	548.36	70.54
AVL-H	25	YKN08000134	795800	AVL-H	2-Jun-08	0.1	2253.3	2270.5	5319.9	703.9	2871.4	555.4	70.36
AVL-H	26	YKN08000134	795850	AVL-H	2-Jun-08	0.1	2230.3	2401.1	5466	724.56	2941.3	557.97	69.26
AVL-H	27	YKN08000134	795775	AVL-H	2-Jun-08	0.11	2229.8	2273.9	5372	684.83	2819.2	557.19	70.27
AVL-H	28	YKN08000119	793750	AVL-H	2-Jun-08	1	2193.7	2365.1	5514	737.3	2924	568.93	72.5
AVL-H	29	YKN08000134	795725	AVL-H	2-Jun-08	0.1	2056.8	2111.7	4853.8	662.7	2647.7	508.73	65.85
AVL-H	30	YKN08000119	793875	**UNK**	2-Jun-08	1	2312	2535.9	5763.6	755.22	3043.3	575.33	71
AVL-H	31	YKN08000130	795000	AVL-H	6-Jun-08	0.1	2193.3	2217.4	5430.8	685.23	2768.2	529.77	67.74
AVL-H	32	YKN08000130	795100	AVL-H	6-Jun-08	0.1	2415.4	2507.8	5620.9	803.81	3216.6	594.08	76.12
AVL-H	33	YKN08000130	795175	**UNK**	6-Jun-08	0.1	2054.1	2085.7	4811.4	640.54	2568.4	498.15	63.61
AVL-H	34	YKN08000137	796075	AVL-H	14-Jun-08	0.11	2180.4	2267.4	5442.8	662.32	2747.4	539.39	66.98
AVL-H	35	YKN08000137	795925	AVL-H	14-Jun-08	0.1	2075	2107.6	5176.5	630.14	2606.9	505.21	63.07
AVL-H	36	YKN08000137	795875	AVL-H	14-Jun-08	0.1	2261.8	2315.4	5564.8	685.71	2800.7	555.48	69.69
AVL-H	37	YKN08000140	796350	AVL-H	7-Jul-08	0.11	2439	2442.7	5417.3	748.94	2946.6	558.1	71.58
AVL-H	38	YKN08000140	796400	AVL-H	7-Jul-08	0.11	2457.6	2337.4	5160.3	759.72	2913.7	560.93	72.73
AVL-H	39	YKN08000155	796625	AVL-H	25-Jul-08	0.1	2187.5	2362.1	5403.8	687.2	2769.7	527.08	65.53
AVL-H	40	YKN08000155	796475	AVL-H	25-Jul-08	0.1	2145.9	2293.8	5563.1	719.64	2788	534.54	69.08
AVL-H	41	YKN08000129	794875	AVL-H	28-Jul-08	0.1	2079.1	2180.7	5064.8	666.46	2621.8	513.69	65.02
AVL-H	42	YKN08000129	794900	AVL-H	28-Jul-08	0.1	2218.7	2325	5349.8	716.42	2863.1	552.66	70.22
AVL-H	43	YKN08000162	712025	**BLANK**	5-Aug-08	0.1	2170.9	2358.2	5580	689.92	2786.6	540.67	66.82
AVL-H	44	YKN08000162	796900	AVL-H	5-Aug-08	0.11	2010.2	2128	4801.3	619.23	2494.5	490.36	60.67
AVL-H	45	YKN08000162	796975	AVL-H	5-Aug-08	0.1	2379.4	2277.8	5346.9	730.23	2870.3	563.79	72.01
AVL-H	46	YKN08000163	712150	**UNK**	21-Aug-08	0.1	2295.1	2315.1	5506.2	718.92	2826.6	557.16	69.5
AVL-H	47	YKN08000163	712100	AVL-H	21-Aug-08	0.11	2637.1	2666.8	6216.3	749.68	3146.9	624.21	78.4
AVL-H	48	YKN07000036R	716730	AVL-H	3-Sep-08		2780	2752.5	5889.5	813.96	3222.9	605.23	76.37
AVL-H	49	YKN08000158	796800	**UNK**	5-Sep-08	0.11	2425.1	2457.4	5867.7	739.01	2989.1	578.64	72.94
AVL-H	50	YKN08000158	796850	**UNK**	5-Sep-08	0.11	2422	2476.2	5397.7	721.16	2892.7	548.6	68.83
AVL-H	51	YKN08000158	796675	AVL-H	5-Sep-08	0.11	2394.9	2519.4	5680.2	740.81	2998.2	564.06	69.86
AVL-H	52	YKN08000167	712300	AVL-H	9-Sep-08	0.1	1973.1	2449.2	5893	664.59	2758.6	522.86	63.04
AVL-H	53	YKN08000167	712250	AVL-H	9-Sep-08	0.1	2495.9	2775.2	6566.9	794.47	3088.6	579.68	72.61
AVL-H	54	YKN08000167	712200	AVL-H	9-Sep-08	0.11	2237.3	2651.5	6368.6	720.09	3015.7	568.53	68.64
AVL-H	55	YKN08000176	712625	AVL-H	10-Sep-08	0.11	2546.8	2576.9	5737.8	811.91	3133.6	606.35	76.4
AVL-H	56	YKN08000176	712675	AVL-H	10-Sep-08	0.11	2236.7	2375.6	5289.7	739.03	2894.9	546.98	69.98
AVL-H	57	YKN08000133	795500	**UNK**	12-Sep-08	0.11	2491.2	2517.2	5229.4	771.71	3038.3	564.39	72.32
AVL-H	58	YKN08000168	712550	AVL-H	8-Oct-08	0.1	2264.6	2344.1	6013.6	679.7	2814.7	546.15	65.94
AVL-H	59	YKN08000168	712425	AVL-H	8-Oct-08	0.11	2186.1	2445.5	5858.7	639.46	2716.6	514.09	62.29

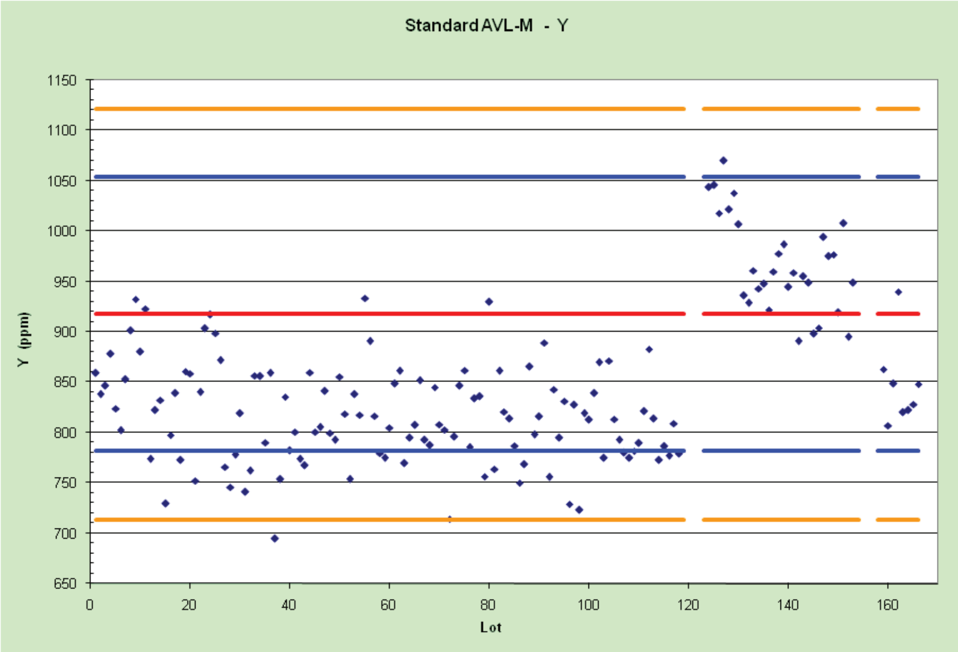
							Y	La	Ce	Pr	Nd	Sm	Eu
Min							1950.6	2085.7	4801.3	619.23	2494.5	490.36	59.81
Mean							**2281.81**	**2388.24**	**5524.54**	**719.17**	**2873.53**	**552.55**	**69.51**
Max							2780	2775.2	6566.9	813.96	3222.9	627.9	84.94
number							59	59	59	59	59	59	59

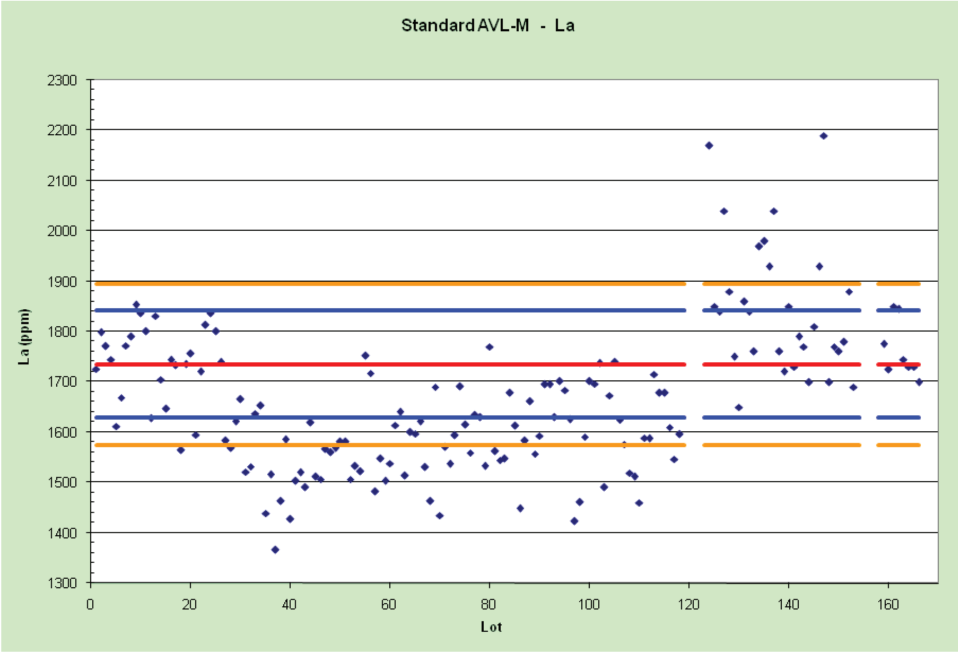
STD_cor	Lot #	WO	Samp_id	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Ga	Hf
AVL-H	1	YKN07000042	684590	462.2	95.63	524	98.82	212.1	27.33	131.2	17.44	97.6	403.6
AVL-H	2	YKN07000036	716700	509.5	102.4	570.8	106.8	232	29.3	144.1	19.23	103.7	434.6
AVL-H	3	YKN07000036	716760	469.7	95.81	531.4	99.47	215.5	27.19	134.3	18	97.1	402.9
AVL-H	4	YKN07000043	684803	493.1	80.3	487.5	86.38	194.7	23.69	124.3	15.47	98	391.3
AVL-H	5	YKN07000043	684740	563.4	93.43	550.1	95.91	221.1	26.84	139.8	17.52	103.9	441.5
AVL-H	6	YKN07000043	684773	510.1	84.91	502.4	89.75	203	24.32	127	15.62	96.3	398.6
AVL-H	7	YKN07000039	716820	493.3	101.4	558.1	104.5	226.5	28.7	140.3	18.41	99	422.3
AVL-H	8	YKN07000039	716850	459.5	93.74	519.1	97.69	209.1	26.96	129.2	17.54	103.4	392.9
AVL-H	9	YKN08000106	793071	564.78	95.62	554.4	102.31	222.98	28.2	141.85	18.38	112.6	428.4
AVL-H	10	YKN08000106	793046	585.01	96	561.29	101.04	232.54	27.57	141.18	18.03	105.4	404
AVL-H	11	YKN08000114	793700	563.93	99.5	564.16	104.03	226.42	28.71	140.81	18.72	106.4	422.1
AVL-H	12	YKN08000117	793350	576.64	97.61	561	100.28	222.46	28.67	139.82	18.45	101.1	397.9
AVL-H	13	YKN08000117	793325	567.92	95.66	542.24	99.21	215.95	27.9	139.83	18.02	103.7	401.2
AVL-H	14	YKN08000115	793450	563.93	100.11	554.95	104.07	226.16	28.04	138.66	18.3	106.7	409.3
AVL-H	15	YKN08000122	794550	567.21	99.14	555.39	102.43	226.08	28.51	139.9	18.5	109.1	404.9
AVL-H	16	YKN08000122	793900	600.12	103.09	575.91	107.86	237.47	29.86	146.63	19.26	106.3	432.2
AVL-H	17	YKN08000125	794775	576.12	98.53	552.72	103.99	225.45	28.31	140.62	18.44	108.6	405
AVL-H	18	YKN08000125	794725	520.24	92.16	512.87	94.55	209.56	26.63	130.12	17.01	103.8	382
AVL-H	19	YKN08000125	794650	571.51	101.99	557.64	103.3	228.66	28.83	140.29	18.77	112.9	422
AVL-H	20	YKN08000132	795200	652.44	113.19	610.94	118.37	256.66	32.97	157.82	21.28	112.8	438.2
AVL-H	21	YKN08000132	795250	590.72	101.56	566.68	106.58	231.25	29.3	142.01	19.37	107.2	422.2
AVL-H	22	YKN08000132	795425	567.76	100.67	557.75	103.68	229.27	28.9	142.15	18.49	105.1	422
AVL-H	23	YKN08000132	795350	560.28	97.43	548.51	99.96	221.34	27.93	139.05	18.3	105.3	415.3
AVL-H	24	YKN08000132	795450	588.93	100.82	565.8	104.69	228.55	29.1	142.15	19.03	107.9	416.1
AVL-H	25	YKN08000134	795800	579.75	97.31	545.05	99.16	220.4	28.38	140	18.41	106.6	418
AVL-H	26	YKN08000134	795850	599.27	95.08	550.55	98.51	224.23	27.15	140.07	17.7	105.7	426.1
AVL-H	27	YKN08000134	795775	585.97	95.95	546.55	100.7	221.91	27.9	140.06	18.04	105.4	402.5
AVL-H	28	YKN08000119	793750	579.88	102.9	568.54	105.61	235.23	29.32	144.01	19.14	108.5	416.2
AVL-H	29	YKN08000134	795725	534.91	90.04	519.34	94.8	206.02	25.74	128.65	16.8	104.5	363.4
AVL-H	30	YKN08000119	793875	675.02	97.96	574.02	102.15	231.2	27.2	142.81	18.06	109.2	413.3
AVL-H	31	YKN08000130	795000	555.19	95.45	530.93	98.88	219.37	27.6	134.49	17.74	105.5	387.1
AVL-H	32	YKN08000130	795100	601.53	106.3	588.41	111.75	246.27	30.16	150.43	19.84	113	440.5
AVL-H	33	YKN08000130	795175	529.23	90.65	504.67	91.97	206	25.92	125.57	16.72	101.9	359.8
AVL-H	34	YKN08000137	796075	543.14	93.33	533.41	97.77	216.75	27.57	134.52	17.82	109.2	415.3
AVL-H	35	YKN08000137	795925	526.77	89.5	503.98	92.57	207.42	25.69	126.15	16.63	102.1	383
AVL-H	36	YKN08000137	795875	590.01	96.15	558.78	101.66	223.85	27.65	138.13	18.35	105.4	393.4
AVL-H	37	YKN08000140	796350	584.5	97.88	553.77	100.09	226.09	27.47	139.72	18.17	112.6	428.9
AVL-H	38	YKN08000140	796400	542.83	101.22	544.55	103.74	231.7	28.42	137.65	18.6	112.9	430.1
AVL-H	39	YKN08000155	796625	573.77	90.46	525.23	94.8	214.73	25.74	132.95	16.83	104.7	401.3
AVL-H	40	YKN08000155	796475	550.53	98.84	535.67	98.04	222.31	27.68	135.53	17.66	113.8	407.6
AVL-H	41	YKN08000129	794875	527.36	93.03	510.31	95.95	213.49	26.52	130.54	17.34	102.6	391.4
AVL-H	42	YKN08000129	794900	553.86	98.49	554.35	102.52	224.64	28.08	137.87	18.48	109.3	406.7
AVL-H	43	YKN08000162	712025	547.37	93.96	520.16	97.22	221.89	27.31	137.08	17.3	109.9	410.2
AVL-H	44	YKN08000162	796900	490.34	85.7	482.69	89.41	199.36	24.83	121.52	16.38	103.6	392.3
AVL-H	45	YKN08000162	796975	611.61	100.67	590.02	105.51	228.02	29.09	146.36	18.71	108.5	414.9
AVL-H	46	YKN08000163	712150	581.73	97.21	555.3	101.68	220.78	28.65	138.32	18.23	105.5	391.3
AVL-H	47	YKN08000163	712100	690.87	108.3	615.9	110.92	249.55	30.76	156.4	19.74	115.5	453.6
AVL-H	48	YKN07000036R	716730	582.05	106.9	605.87	111.86	247.86	30.45	150.61	19.69	109.1	433.8
AVL-H	49	YKN08000158	796800	611.41	101.47	571.13	104.39	230.91	28.72	149.55	19.4	115.5	431.5
AVL-H	50	YKN08000158	796850	548.93	93.98	537.36	98.12	224.5	26.64	133.05	17.24	106.5	408.6
AVL-H	51	YKN08000158	796675	533.25	95.97	559.49	101.49	232.16	27.56	137.77	17.5	101.3	395.8
AVL-H	52	YKN08000167	712300	552.8	85.55	516.95	88.82	206.11	24.7	130.46	15.86	101.6	399.4
AVL-H	53	YKN08000167	712250	650.55	100.17	573.69	102.78	232.94	28.52	146.4	18.66	114.9	456.9
AVL-H	54	YKN08000167	712200	648.74	94.63	562.57	97.06	221.76	27.29	142.82	17.53	107.2	434.6
AVL-H	55	YKN08000176	712625	640.38	109.89	630.88	112.99	243.33	30.95	153.86	20.32	108.3	455.7
AVL-H	56	YKN08000176	712675	578.4	96.89	545.15	102.46	227.71	27.66	136.71	17.96	109.3	416.3
AVL-H	57	YKN08000133	795500	583.29	98.47	553.57	101.85	225.6	27.79	137.52	17.73	110.4	412
AVL-H	58	YKN08000168	712550	591.57	89.98	532.62	92.03	210.09	25.45	135.25	16.67	106.5	409.5
AVL-H	59	YKN08000168	712425	548.62	85.98	485.31	86.76	199.06	24.12	123.56	16.02	103	406.9

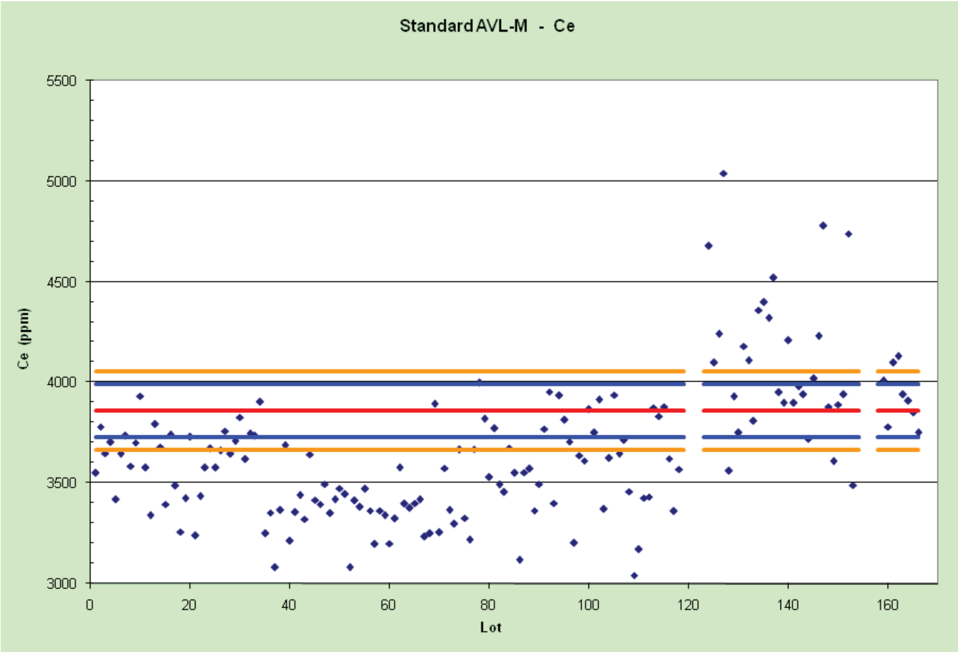
				Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Ga	Hf
Min				459.5	80.3	482.69	86.38	194.7	23.69	121.52	15.47	96.3	359.8
Mean				**566.17**	**96.90**	**548.69**	**100.54**	**223.19**	**27.77**	**138.47**	**18.05**	**106.50**	**412.2**
Max				690.87	113.19	630.88	118.37	256.66	32.97	157.82	21.28	115.5	456.9
number				59	59	59	59	59	59	59	59	59	59

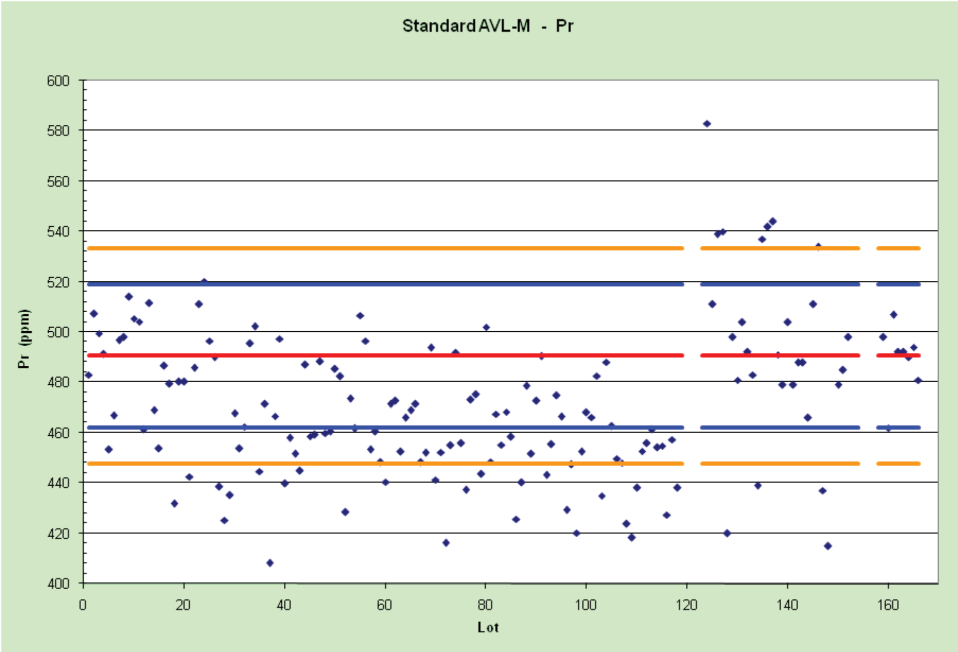
STD_cor	Lot #	WO	Samp_id	Nb	Ta	Th	Zr	Hole_id
AVL-H	1	YKN07000042	684590	3054	265.7	257.1	16405	L07-062
AVL-H	2	YKN07000036	716700	3235	290.7	285.3	18744	L07-057A
AVL-H	3	YKN07000036	716760	3094	270.2	266.2	16927	L07-058
AVL-H	4	YKN07000043	684803	2898	260.8	221.8	17294	L07-064
AVL-H	5	YKN07000043	684740	3146	290.8	230	19177	L07-064
AVL-H	6	YKN07000043	684773	2913	264.5	222.4	17621	L07-064
AVL-H	7	YKN07000039	716820	3115	270.2	279	17716	L07-059
AVL-H	8	YKN07000039	716850	2403	268	243.1	16495	L07-059
AVL-H	9	YKN08000106	793071	2990	263.3	249.1	18521.9	L08-065
AVL-H	10	YKN08000106	793046	2627.2	255.3	260.8	17678.4	L08-065
AVL-H	11	YKN08000114	793700	2791.3	253.9	262.9	18706.5	L08-073
AVL-H	12	YKN08000117	793350	2880.6	245.4	269.6	18437.7	L08-069
AVL-H	13	YKN08000117	793325	2903.2	238.4	254.8	18306.5	L08-069
AVL-H	14	YKN08000115	793450	2776.3	251.3	283.8	18713.8	L08-070
AVL-H	15	YKN08000122	794550	2906.6	247.3	284.5	18164.8	L08-076
AVL-H	16	YKN08000122	793900	2697.6	266.7	271.2	18410.3	L08-075A
AVL-H	17	YKN08000125	794775	2836	248.1	280.5	18217.1	L08-079
AVL-H	18	YKN08000125	794725	2649.9	232.2	257.2	17009.6	L08-078
AVL-H	19	YKN08000125	794650	2934.7	260.9	299.3	19185.9	L08-077
AVL-H	20	YKN08000132	795200	2952.4	268.5	314.4	19511.8	L08-083
AVL-H	21	YKN08000132	795250	2940.1	247.8	293.4	18259.7	L08-084
AVL-H	22	YKN08000132	795425	2970.7	260.3	295.2	18884.9	L08-086
AVL-H	23	YKN08000132	795350	2745.6	253.7	283.8	18359.2	L08-085
AVL-H	24	YKN08000132	795450	2793.9	253.1	262.8	17833.7	L08-086
AVL-H	25	YKN08000134	795800	2914	267.6	269.7	17823.4	L08-089
AVL-H	26	YKN08000134	795850	2898.5	281.6	255.8	17904.2	L08-090
AVL-H	27	YKN08000134	795775	2761.5	263.2	261.6	17345	L08-089
AVL-H	28	YKN08000119	793750	2838.7	259.4	289.5	18389.5	L08-073
AVL-H	29	YKN08000134	795725	2532.4	245.5	242.4	16422.8	L08-089
AVL-H	30	YKN08000119	793875	2874.8	268.8	259.8	18376.4	L08-075A
AVL-H	31	YKN08000130	795000	2706.4	236.7	268.2	19569.9	L08-081
AVL-H	32	YKN08000130	795100	2942.7	298.3	301.1	19399	L08-082
AVL-H	33	YKN08000130	795175	2597.7	224.7	259.4	17111.9	L08-083
AVL-H	34	YKN08000137	796075	2980.8	257.8	249.9	17979.2	L08-091
AVL-H	35	YKN08000137	795925	2834.3	241.7	237.7	17272.2	L08-090
AVL-H	36	YKN08000137	795875	2915.1	259.5	260.4	17725.9	L08-090
AVL-H	37	YKN08000140	796350	3056.1	287.5	278.5	18735	L08-095
AVL-H	38	YKN08000140	796400	2933.5	281.6	282.2	19476.8	L08-096
AVL-H	39	YKN08000155	796625	2942.1	271.2	247.3	17734.2	L08-098
AVL-H	40	YKN08000155	796475	2808.4	269.7	277.3	20001.7	L08-097
AVL-H	41	YKN08000129	794875	2638.3	242.2	268.1	17230.1	L08-080
AVL-H	42	YKN08000129	794900	2786.1	252.5	274.3	17650.8	L08-080
AVL-H	43	YKN08000162	712025	2843.7	267.2	262.6	19029.6	L08-102
AVL-H	44	YKN08000162	796900	2670	266.3	245.7	16863.9	L08-101
AVL-H	45	YKN08000162	796975	2783.7	275.9	297.4	19014.5	L08-102
AVL-H	46	YKN08000163	712150	2822.3	266	278.9	18030.4	L08-103
AVL-H	47	YKN08000163	712100	3218.6	299	294	20003.9	L08-103
AVL-H	48	YKN07000036R	716730	3242.5	298.9	290.1	19865.1	L07-058
AVL-H	49	YKN08000158	796800	3232.2	280.2	259.8	18713.2	L08-099
AVL-H	50	YKN08000158	796850	2875.5	283.7	252.6	19461.8	L08-099
AVL-H	51	YKN08000158	796675	2895.8	287	262.8	18522.4	L08-098
AVL-H	52	YKN08000167	712300	2831.3	260.7	208.5	17856.5	L08-105
AVL-H	53	YKN08000167	712250	3537.5	298.9	251.1	20075.7	L08-104
AVL-H	54	YKN08000167	712200	3038.7	289.3	237.2	19223.2	L08-104
AVL-H	55	YKN08000176	712625	2664.3	270.5	300.5	18087.8	L08-108
AVL-H	56	YKN08000176	712675	2898.6	278.8	265.5	18823.6	L08-108
AVL-H	57	YKN08000133	795500	2933	283.9	266	18180.2	L08-086
AVL-H	58	YKN08000168	712550	2879.8	276.5	219.9	18691.5	L08-107
AVL-H	59	YKN08000168	712425	3258.8	265	213.9	18072.3	L08-106

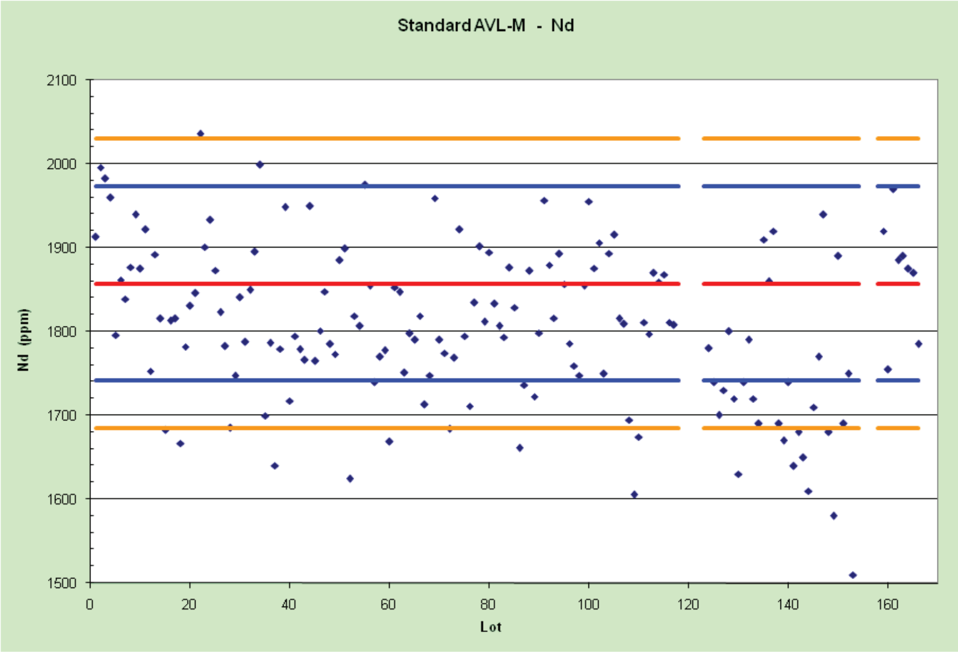
				Nb	Ta	Th	Zr	
Min				2403	224.7	208.5	16405	
Mean				**2895.6**	**265.84**	**264.71**	**18292.28**	
Max				3537.5	299	314.4	20075.7	
number				59	59	59	59	

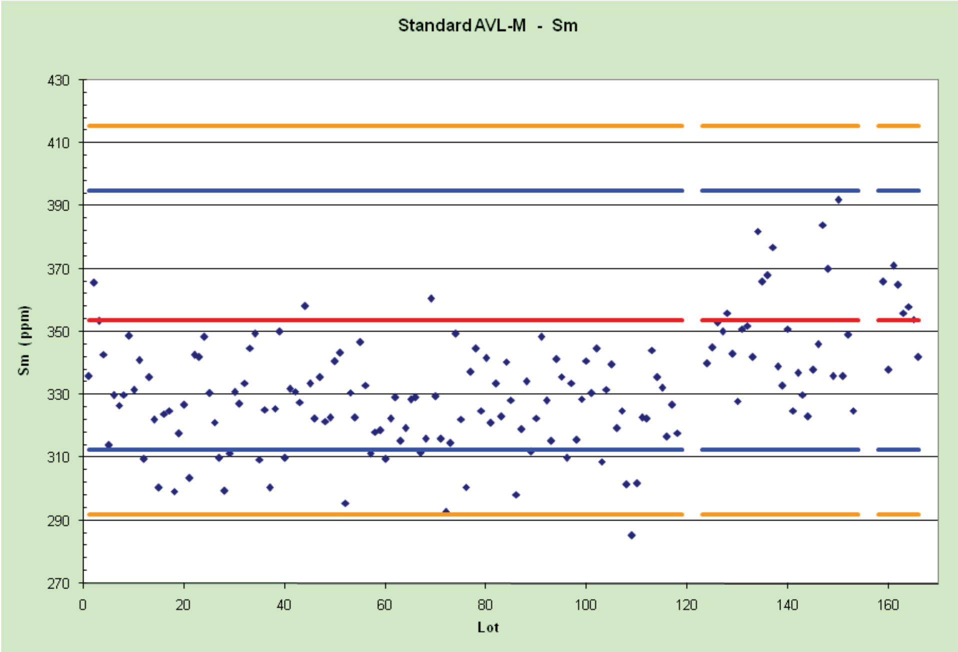

Standard AVL-M - Y
Y (ppm)
Lot
1150
1100
1050
1000
950
900
850
800
750
700
650
0
20
40
60
80
100
120
140
160

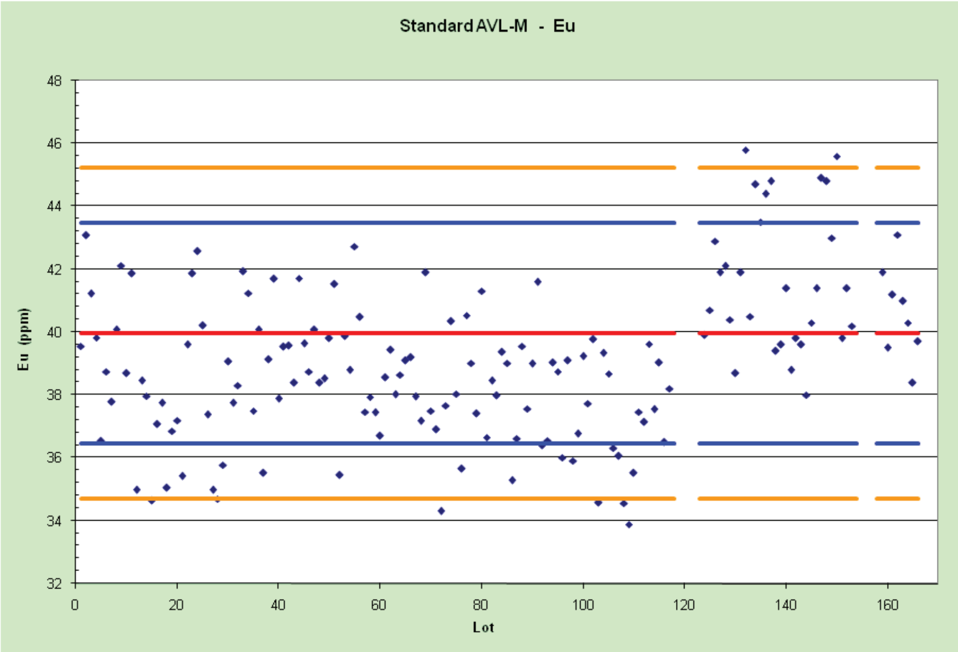

Standard AVL-M - La
La (ppm)
Lot
2300
2200
2100
2000
1900
1800
1700
1600
1500
1400
1300
0
20
40
60
80
100
120
140
160

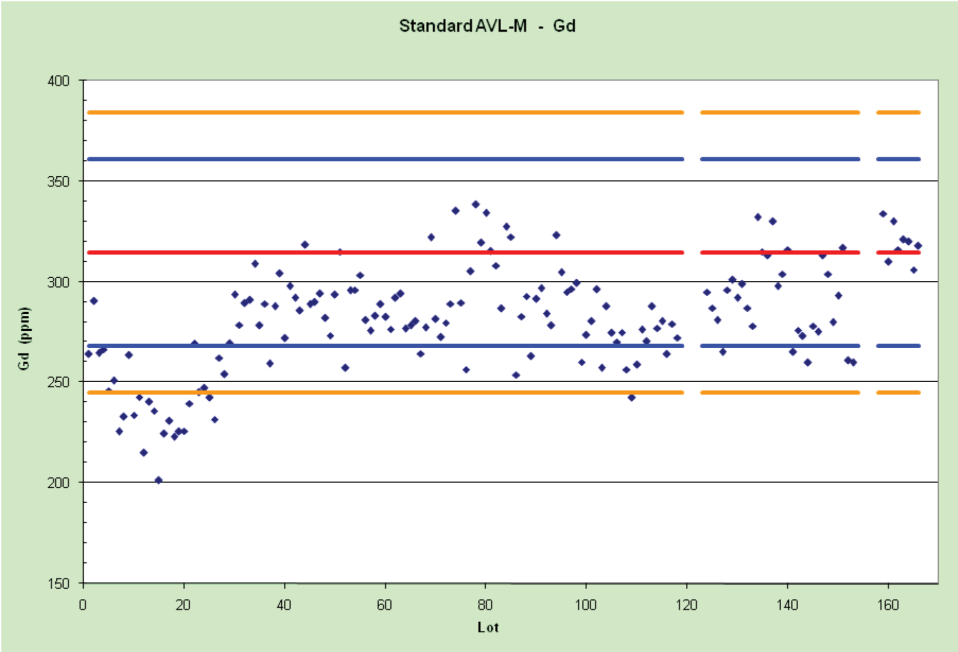

Standard AVL-M - Ce
Ce (ppm)
Lot
5500
5000
4500
4000
3500
3000
0
20
40
60
80
100
120
140
160

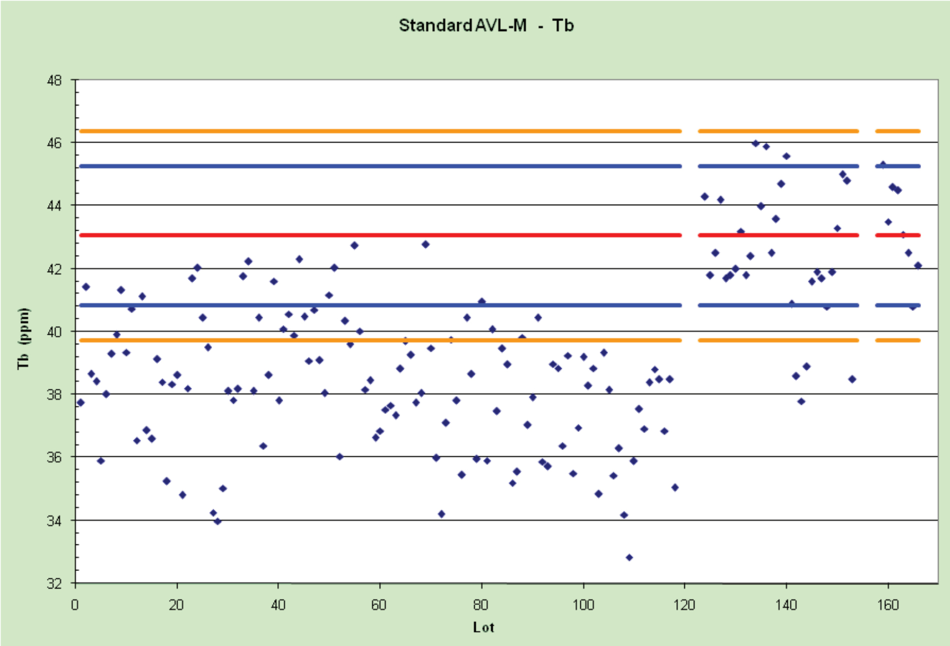

Standard AVL-M - Pr
Pr (ppm)
Lot
600
580
560
540
520
500
480
460
440
420
400
0
20
40
60
80
100
120
140
160

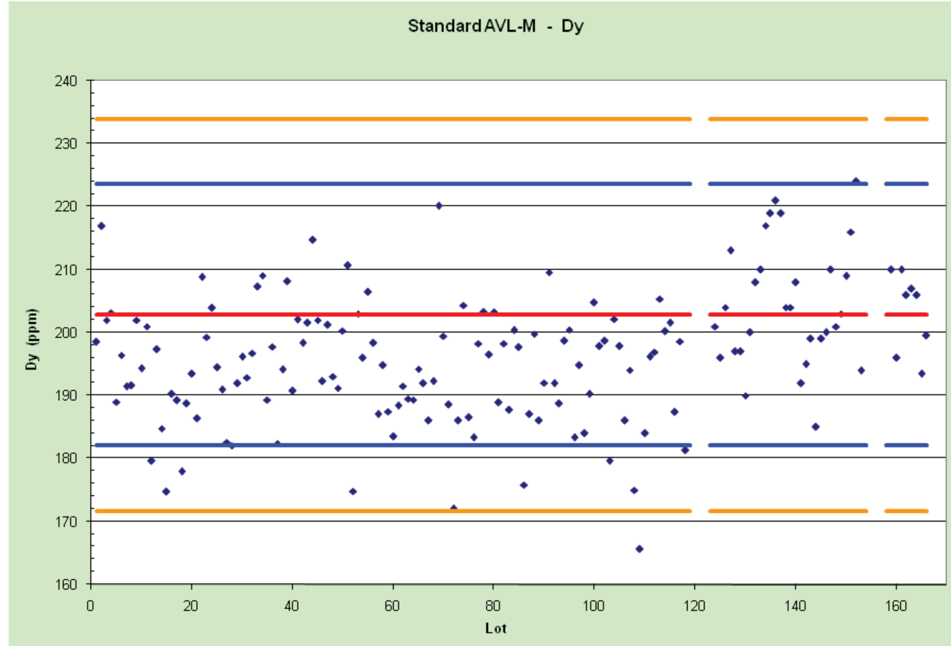

Standard AVL-M - Nd
Nd (ppm)
Lot

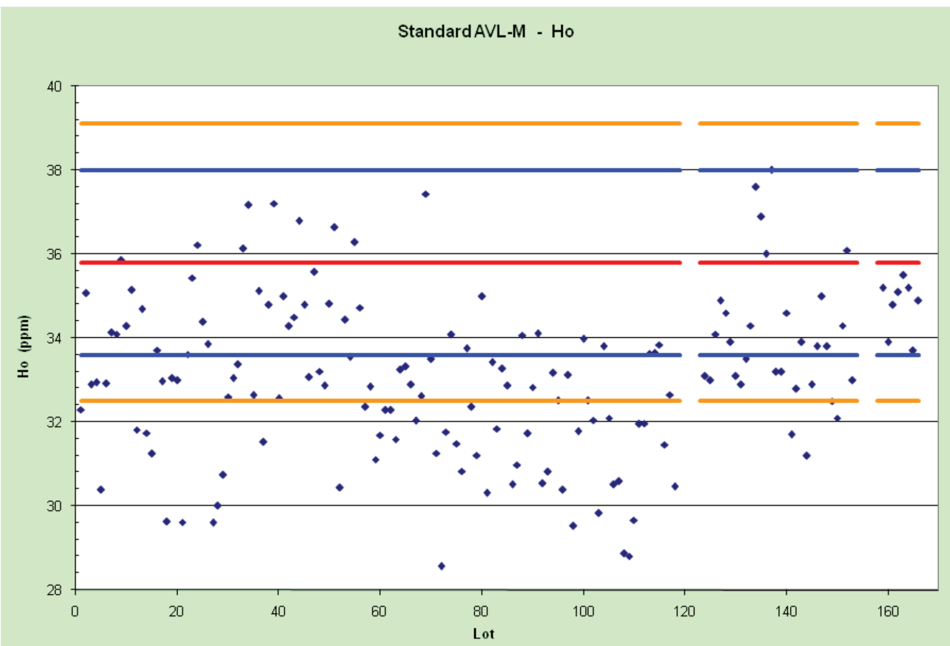

Standard AVL-M - Sm
Sm (ppm)
Lot

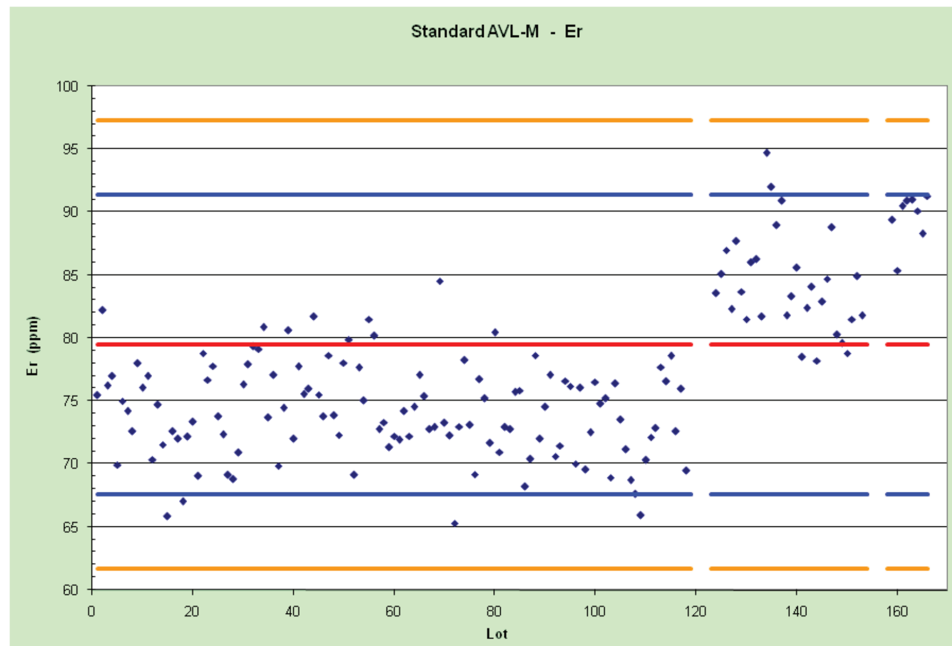

Standard AVL-M - Eu
Eu (ppm)
Lot

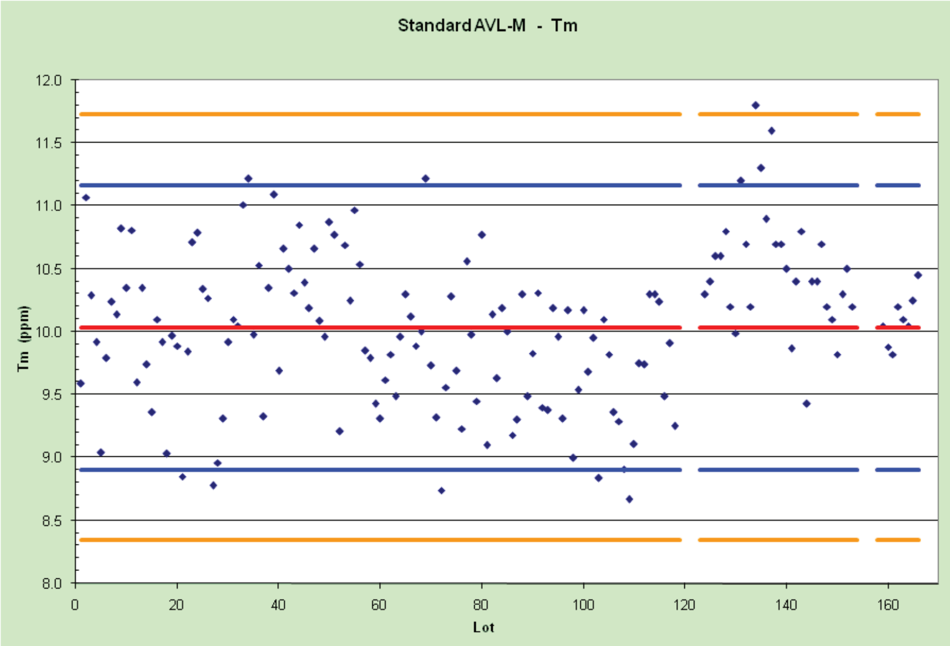

Standard AVL-M - Gd
Gd (ppm)
Lot

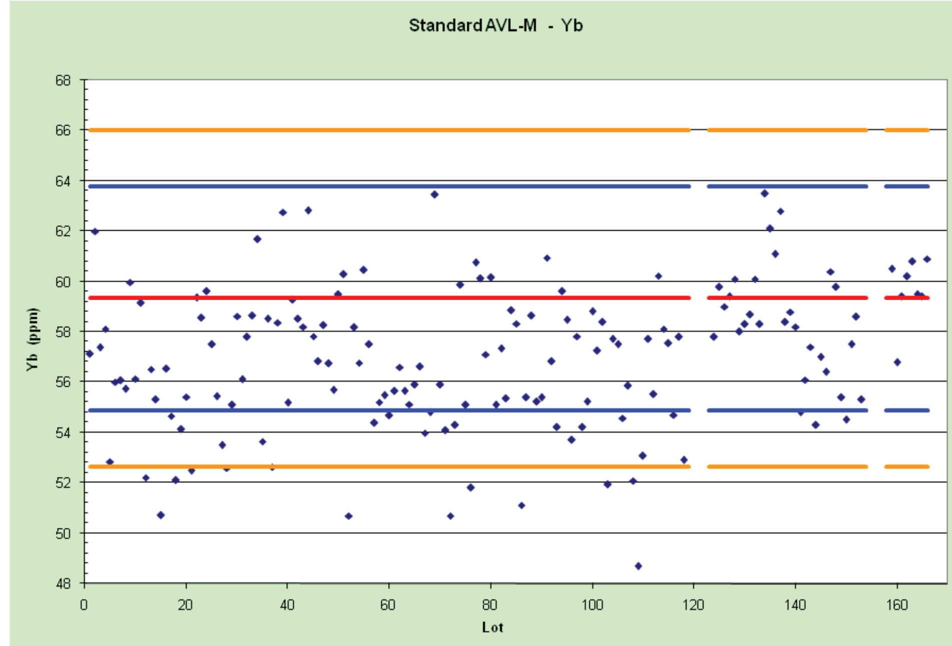

Standard AVL-M - Tb
Tb (ppm)
Lot
48
46
44
42
40
38
36
34
32
0
20
40
60
80
100
120
140
160

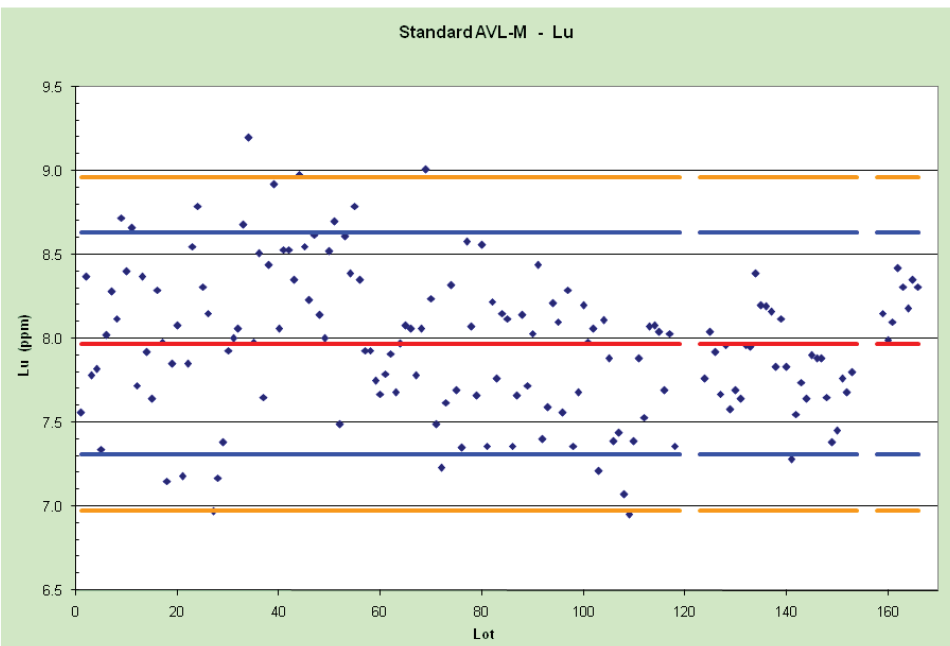

Standard AVL-M - Dy
Dy (ppm)
Lot
240
230
220
210
200
190
180
170
160
0
20
40
60
80
100
120
140
160

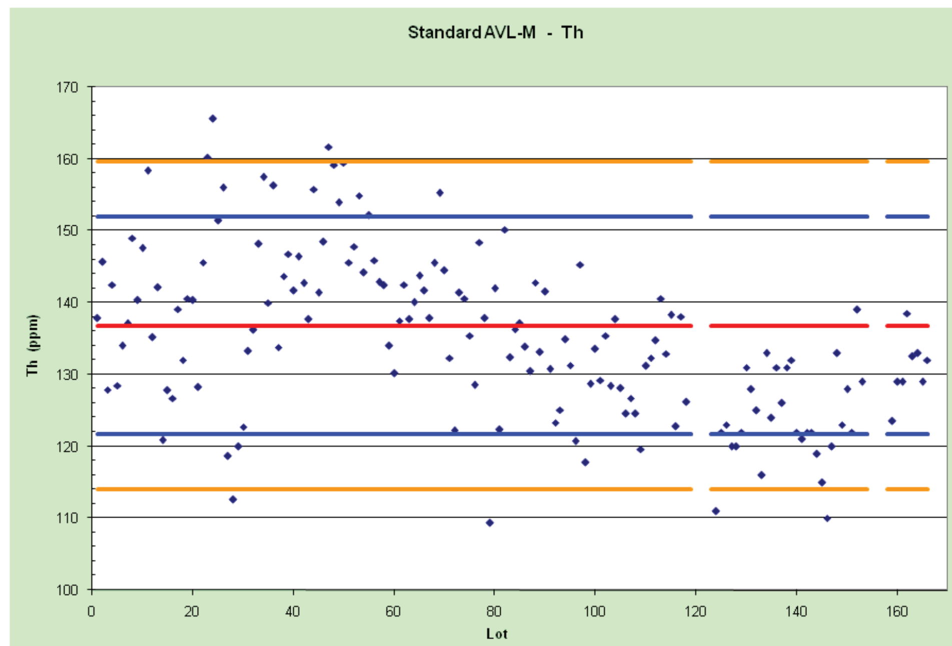

Standard AVL-M - Ho
Ho (ppm)
Lot
40
38
36
34
32
30
28
0
20
40
60
80
100
120
140
160

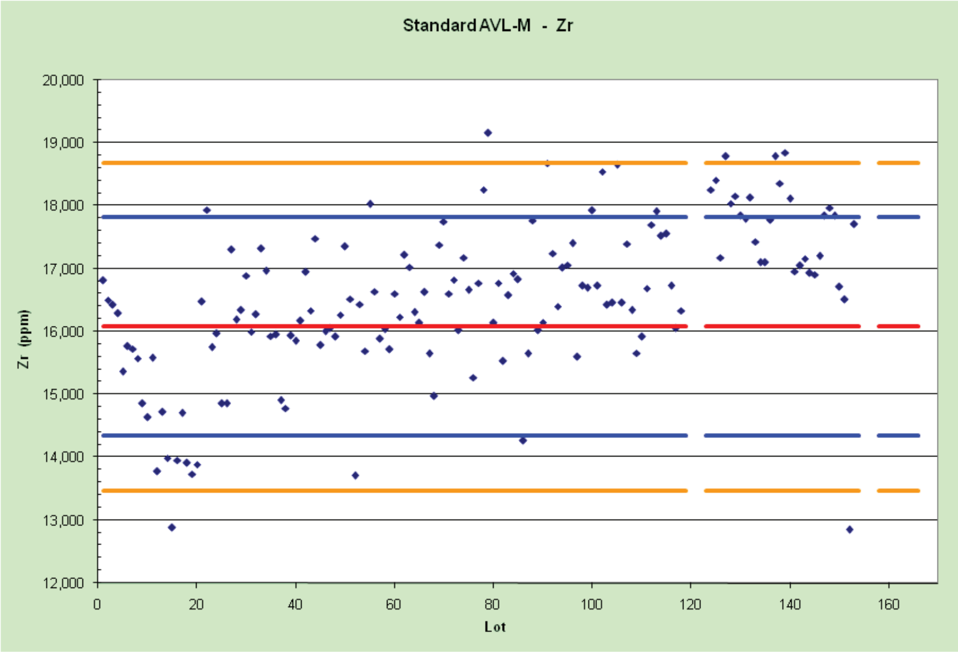

Standard AVL-M - Er
Er (ppm)
Lot
100
95
90
85
80
75
70
65
60
0
20
40
60
80
100
120
140
160

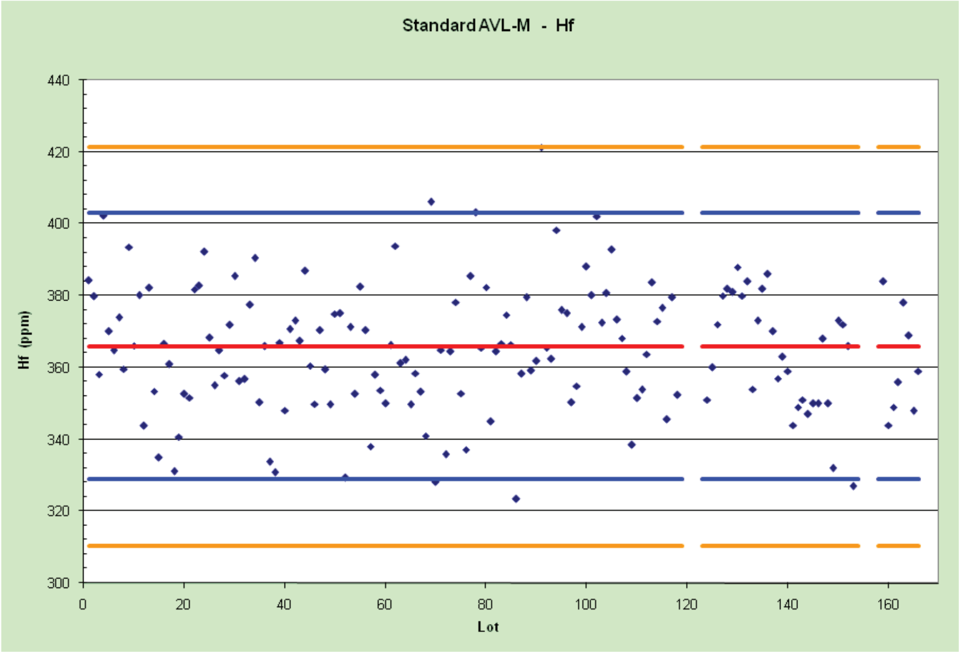

Standard AVL-M - Tm
Tm (ppm)
Lot
12.0
11.5
11.0
10.5
10.0
9.5
9.0
8.5
8.0
0
20
40
60
80
100
120
140
160

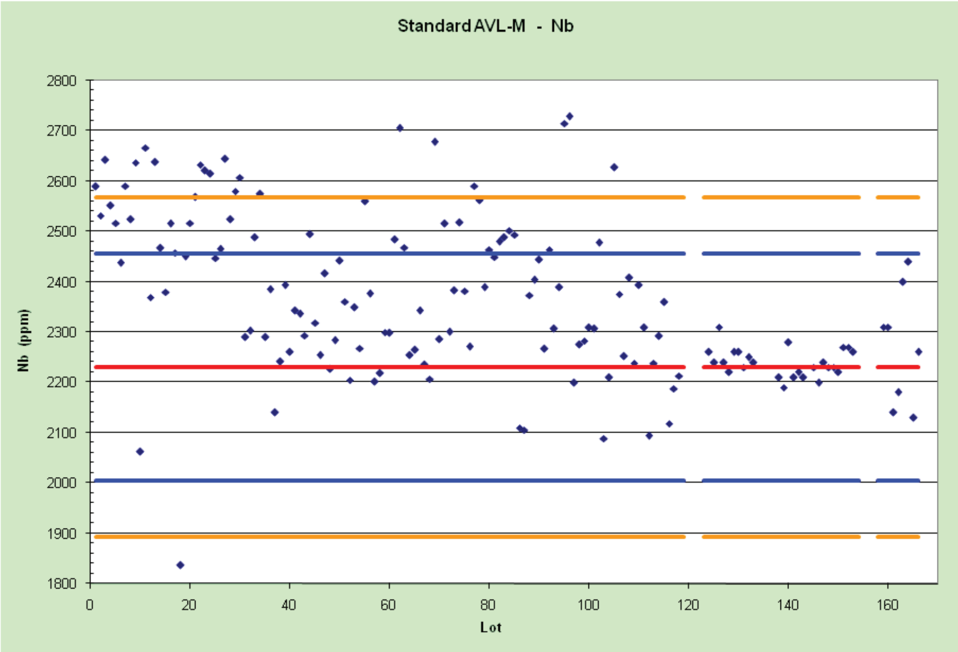

Standard AVL-M - Yb
Yb (ppm)
Lot
68
66
64
62
60
58
56
54
52
50
48
0
20
40
60
80
100
120
140
160

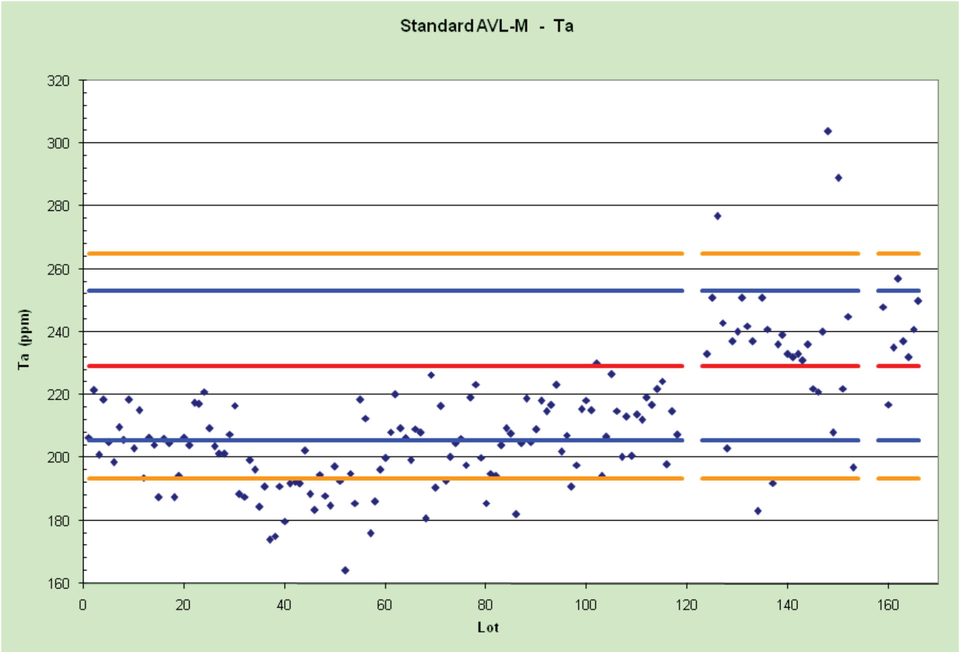

Standard AVL-M - Lu
Lu (ppm)
Lot
9.5
9.0
8.5
8.0
7.5
7.0
6.5
0
20
40
60
80
100
120
140
160

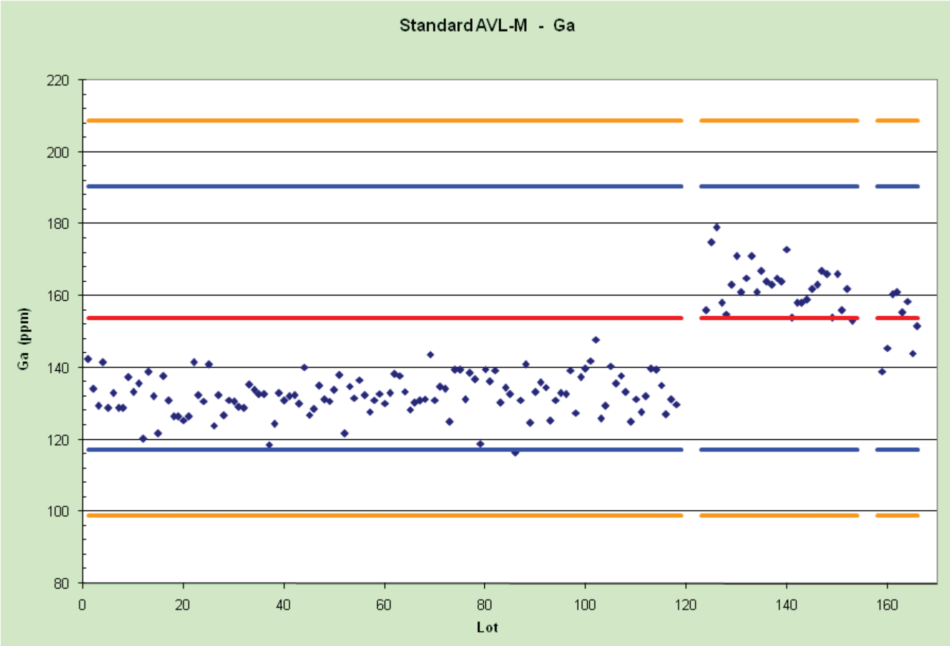

Standard AVL-M - Th
Th (ppm)
Lot
170
160
150
140
130
120
110
100
0
20
40
60
80
100
120
140
160


Standard AVL-M - Zr
Zr (ppm)
Lot
20,000
19,000
18,000
17,000
16,000
15,000
14,000
13,000
12,000
0
20
40
60
80
100
120
140
160


Standard AVL-M - Hf
Hf (ppm)
Lot
440
420
400
380
360
340
320
300
0
20
40
60
80
100
120
140
160


Standard AVL-M - Nb
Nb (ppm)
Lot
2800
2700
2600
2500
2400
2300
2200
2100
2000
1900
1800
0
20
40
60
80
100
120
140
160


Standard AVL-M - Ta
Ta (ppm)
Lot
320
300
280
260
240
220
200
180
160
0
20
40
60
80
100
120
140
160


Standard AVL-M - Ga
Ga (ppm)
220
200
180
160
140
120
100
80
0
20
40
60
80
100
120
140
160
Lot

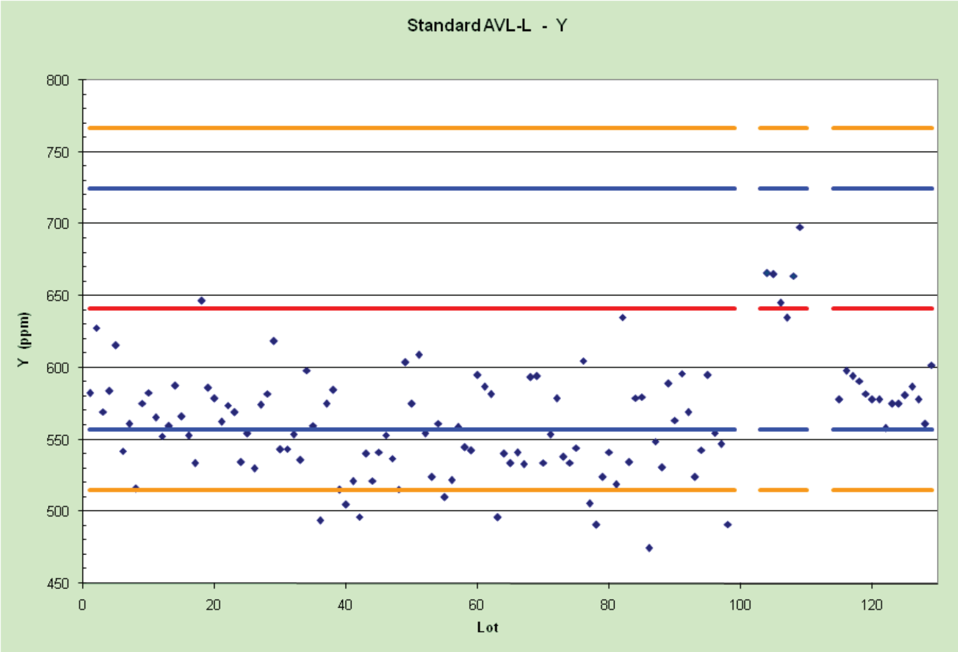
STD_cor	Lot #	WO	Samp_id	Date	STD_orig	WT	Y	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy
AVL-M	1	YKN07000040	684560	18-Dec-07	AVL-M		773.9	1628	3340	461.2	1753	309.6	34.98	215.2	36.55	179.6
AVL-M	2	YKN07000021	716210	18-Dec-07	***UNK***		859	1726	3551	483.1	1913	336	39.56	264.2	37.75	198.5
AVL-M	3	YKN07000021	716225	18-Dec-07	***UNK***		837.8	1798	3780	507.4	1996	365.7	43.09	290.6	41.44	216.9
AVL-M	4	YKN07000021	716240	18-Dec-07	***UNK***		846.4	1771	3647	499.5	1983	353.6	41.22	264.6	38.67	202
AVL-M	5	YKN07000021	716255	18-Dec-07	***UNK***		878.5	1745	3704	491.2	1960	342.9	39.82	266.4	38.43	203.2
AVL-M	6	YKN07000021	716265	18-Dec-07	***UNK***		823.9	1612	3418	453.4	1796	314	36.54	245.9	35.91	189
AVL-M	7	YKN07000035	716490	18-Dec-07	***UNK***		802.6	1669	3644	466.8	1862	329.8	38.75	250.8	38.01	196.4
AVL-M	8	YKN07000035	716520	18-Dec-07	***UNK***		853.2	1772	3735	496.9	1839	326.6	37.79	225.6	39.3	191.5
AVL-M	9	YKN07000035	716550	18-Dec-07	***UNK***		901.5	1790	3584	497.9	1877	330	40.09	233	39.91	191.6
AVL-M	10	YKN07000035	716580	18-Dec-07	***UNK***		932.7	1853	3700	514.2	1940	348.7	42.12	263.5	41.32	202
AVL-M	11	YKN07000035	716610	18-Dec-07	***UNK***		880.3	1837	3932	505.4	1875	331.6	38.69	233.7	39.35	194.3
AVL-M	12	YKN07000035	716640	18-Dec-07	***UNK***		923.2	1801	3578	504.2	1922	341	41.86	242.7	40.74	201
AVL-M	13	YKN07000040	716940	18-Dec-07	AVL-M		822	1831	3794	511.6	1892	335.6	38.45	240.3	41.12	197.4
AVL-M	14	YKN07000040	716970	18-Dec-07	AVL-M		832.2	1705	3679	468.8	1816	322.2	37.97	235.8	36.88	184.8
AVL-M	15	YKN07000042	684620	20-Dec-07	AVL-M		729.2	1646	3395	453.8	1683	300.4	34.64	201.3	36.61	174.7
AVL-M	16	YKN07000042	684680	20-Dec-07	AVL-M		797.6	1744	3739	486.5	1813	324	37.08	224.4	39.14	190.3
AVL-M	17	YKN07000034	716280	21-Dec-07	***UNK***		839.1	1733	3488	479.5	1816	325	37.74	231	38.41	189.3
AVL-M	18	YKN07000034	716295	21-Dec-07	***UNK***		772.5	1564	3258	431.8	1667	299.3	35.06	222.9	35.26	177.9
AVL-M	19	YKN07000036	716670	21-Dec-07	AVL-M		860.8	1736	3422	480.3	1782	317.8	36.85	225.6	38.34	188.7
AVL-M	20	YKN07000033	716315	8-Jan-08	***UNK***		858.7	1756	3731	480.3	1831	326.9	37.19	225.8	38.63	193.5
AVL-M	21	YKN07000033	716335	8-Jan-08	***UNK***		752	1595	3239	442.5	1846	303.6	35.43	239.6	34.82	186.4
AVL-M	22	YKN07000033	716355	8-Jan-08	***UNK***		840.5	1720	3433	485.9	2036	342.6	39.6	269.6	38.2	208.8
AVL-M	23	YKN07000033	716375	8-Jan-08	***UNK***		903.6	1813	3577	511	1901	342.1	41.87	245.1	41.7	199.3
AVL-M	24	YKN07000033	716400	8-Jan-08	***UNK***		917.3	1837	3672	520.2	1933	348.4	42.57	247.3	42.03	203.9
AVL-M	25	YKN07000033	716430	8-Jan-08	***UNK***		898.7	1800	3576	496.6	1873	330.6	40.22	242.3	40.46	194.5
AVL-M	26	YKN07000033	716460	8-Jan-08	***UNK***		872.2	1740	3662	490.1	1823	321.3	37.38	231.6	39.5	190.9
AVL-M	27	YKN07000021R	716165	15-Jan-08	***UNK***		765.7	1583	3758	438.4	1783	309.9	34.98	262.3	34.26	182.6
AVL-M	28	YKN07000021R	716180	15-Jan-08	***UNK***		745.8	1569	3646	425.3	1685	299.5	34.69	254.1	33.99	182.1
AVL-M	29	YKN07000021R	716195	15-Jan-08	***UNK***		777.9	1621	3710	435.2	1747	311.5	35.78	269.2	35.03	191.9
AVL-M	30	YKN07000043	684710	29-Jan-08	AVL-M		819.2	1666	3828	467.7	1841	330.8	39.06	293.5	38.12	196.2
AVL-M	31	YKN08000108	793200	10-Apr-08	AVL-M		740.9	1521.4	3620.4	453.71	1787.6	327.07	37.75	278.53	37.83	192.86
AVL-M	32	YKN08000108	793250	10-Apr-08	AVL-M		762	1532	3747.1	462.32	1849.9	333.7	38.31	289.29	38.18	196.78
AVL-M	33	YKN08000107	793121	21-Apr-08	AVL-M		856.5	1637	3735.7	495.58	1895	344.91	41.94	290.89	41.77	207.33
AVL-M	34	YKN08000107	793147	21-Apr-08	AVL-M		856.2	1652.6	3901.9	502.26	1999	349.47	41.24	308.82	42.24	209.08
AVL-M	35	YKN08000114	793525	1-May-08	AVL-M	0.1	790.2	1439	3251.1	444.59	1699.9	309.44	37.5	278.36	38.12	189.36
AVL-M	36	YKN08000114	793550	1-May-08	AVL-M	0.1	859.4	1515.5	3352.6	471.55	1786.4	325.29	40.09	289.08	40.44	197.75
AVL-M	37	YKN08000114	793625	1-May-08	AVL-M	0.1	694.7	1366.6	3082.2	408.13	1640.1	300.43	35.53	259.42	36.38	182.42
AVL-M	38	YKN08000117	793300	2-May-08	AVL-M		754	1463.7	3364.8	466.65	1779.5	325.63	39.14	287.94	38.62	194.18
AVL-M	39	YKN08000117	793425	2-May-08	AVL-M		835.5	1586.2	3688.8	497.44	1948.5	350.05	41.71	304.25	41.62	208.11
AVL-M	40	YKN08000122	793950	9-May-08	AVL-M	0.1	782.5	1427.7	3213.8	439.69	1717.4	309.97	37.88	272.06	37.81	190.78
AVL-M	41	YKN08000122	793976	9-May-08	AVL-M	0.1	800.7	1503.9	3355.6	457.95	1794.9	331.83	39.53	297.83	40.1	202.1
AVL-M	42	YKN08000122	794525	9-May-08	AVL-M	4	774	1519.9	3438.1	451.66	1779.1	331	39.58	292.02	40.57	198.32
AVL-M	43	YKN08000122	794575	9-May-08	AVL-M	5.5	767.1	1490.4	3321.6	445	1766.5	327.62	38.38	285.66	39.89	201.56
AVL-M	44	YKN08000122	794625	9-May-08	AVL-M	4.5	859.9	1619.5	3643.4	487.1	1949.4	358.22	41.72	318.49	42.3	214.76
AVL-M	45	YKN08000125	794750	22-May-08	AVL-M	0.1	800.6	1512	3416.6	458.52	1765.3	333.46	39.63	288.8	40.48	202.01
AVL-M	46	YKN08000125	794800	22-May-08	AVL-M	0.1	805.1	1506.4	3395.1	459.33	1801.2	322.43	38.75	289.85	39.08	192.27
AVL-M	47	YKN08000132	795275	29-May-08	AVL-M	0.1	841.4	1566.8	3495.1	488.42	1848	335.67	40.08	294.23	40.7	201.26
AVL-M	48	YKN08000132	795300	29-May-08	AVL-M	0.1	799.6	1559.6	3349.7	459.81	1785.4	321.54	38.4	281.99	39.1	193.03

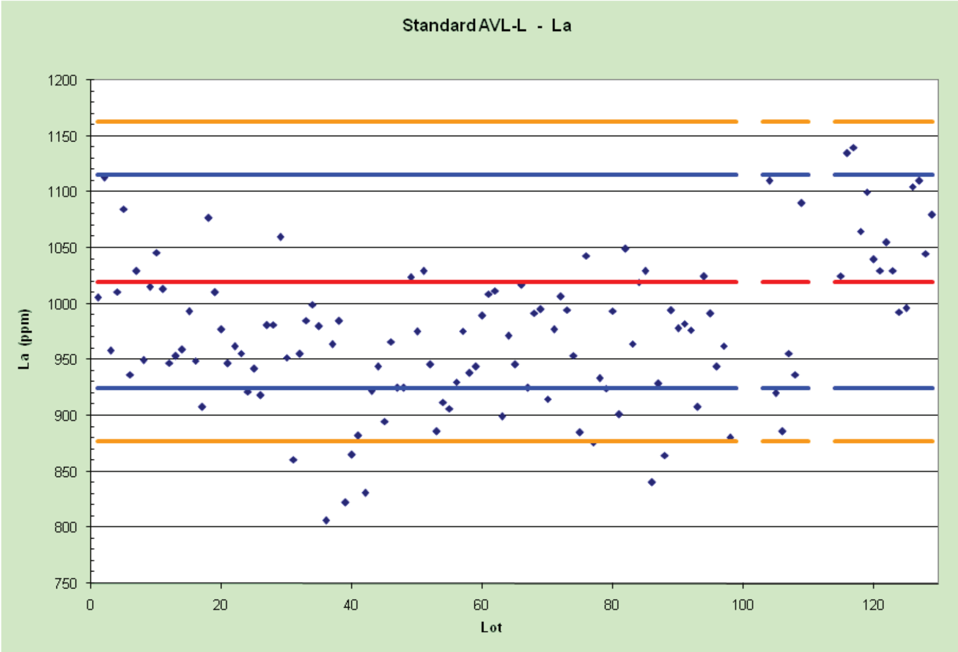
STD_cor	Lot #	WO	Samp_id	Ho	Er	Tm	Yb	Lu	Ga	Hf	Nb	Ta	Th	Zr	Hole_id
AVL-M	1	YKN07000040	684560	31.82	70.37	9.6	52.21	7.72	120.2	343.8	2369	193.7	135.2	13783	L07-061A
AVL-M	2	YKN07000021	716210	32.3	75.46	9.59	57.14	7.56	142.4	384.3	2590	206.5	137.9	16815	L07-052
AVL-M	3	YKN07000021	716225	35.08	82.23	11.07	62	8.37	134.2	379.9	2532	221.5	145.7	16501	L07-052
AVL-M	4	YKN07000021	716240	32.9	76.23	10.29	57.38	7.78	129.5	358.1	2643	200.9	127.9	16433	L07-052
AVL-M	5	YKN07000021	716255	32.94	77	9.92	58.12	7.82	141.6	402.3	2552	218.6	142.5	16296	L07-052
AVL-M	6	YKN07000021	716265	30.39	69.95	9.04	52.84	7.34	128.8	370	2517	204.9	128.5	15362	L07-053
AVL-M	7	YKN07000035	716490	32.92	75	9.79	56.01	8.02	133	364.7	2438	198.5	134	15769	L07-055
AVL-M	8	YKN07000035	716520	34.14	74.2	10.24	56.06	8.28	128.8	374	2591	209.7	137.1	15728	L07-055
AVL-M	9	YKN07000035	716550	34.1	72.6	10.14	55.73	8.12	128.9	359.6	2525	205.7	149	15578	L07-055
AVL-M	10	YKN07000035	716580	35.85	78.03	10.82	59.97	8.72	137.4	393.6	2637	218.5	140.4	14858	L07-056A
AVL-M	11	YKN07000035	716610	34.29	76.07	10.35	56.13	8.4	133.2	366.1	2062	203	147.6	14635	L07-056A
AVL-M	12	YKN07000035	716640	35.14	77	10.81	59.14	8.66	135.7	380.2	2667	215.1	158.4	15588	L07-057A
AVL-M	13	YKN07000040	716940	34.7	74.71	10.35	56.51	8.37	138.8	382.2	2638	206.3	142.1	14724	L07-060
AVL-M	14	YKN07000040	716970	31.74	71.56	9.74	55.31	7.92	132	353.4	2467	204.2	120.9	13990	L07-061A
AVL-M	15	YKN07000042	684620	31.25	65.85	9.36	50.72	7.64	121.7	334.9	2380	187.5	127.8	12884	L07-062
AVL-M	16	YKN07000042	684680	33.72	72.58	10.1	56.53	8.29	137.6	366.5	2516	206	126.7	13954	L07-063
AVL-M	17	YKN07000034	716280	32.97	72.01	9.92	54.66	7.98	130.9	360.9	2458	204.6	139.1	14701	L07-053
AVL-M	18	YKN07000034	716295	29.63	67.05	9.03	52.12	7.15	126.5	331.2	1836	187.5	132	13909	L07-053
AVL-M	19	YKN07000036	716670	33.04	72.17	9.97	54.13	7.85	126.4	340.7	2451	194.3	140.6	13734	L07-057A
AVL-M	20	YKN07000033	716315	33	73.37	9.89	55.42	8.08	125.4	352.7	2517	206.3	140.4	13887	L07-053
AVL-M	21	YKN07000033	716335	29.62	69.05	8.85	52.5	7.18	126.4	351.6	2569	204.1	128.3	16481	L07-053
AVL-M	22	YKN07000033	716355	33.62	78.8	9.84	59.37	7.85	141.5	381.8	2633	217.5	145.6	17939	L07-053
AVL-M	23	YKN07000033	716375	35.44	76.7	10.71	58.56	8.55	132.3	382.8	2621	217.2	160.2	15748	L07-053
AVL-M	24	YKN07000033	716400	36.22	77.78	10.79	59.63	8.79	130.8	392.3	2615	221	165.6	15976	L07-053
AVL-M	25	YKN07000033	716430	34.38	73.8	10.34	57.51	8.31	140.9	368.3	2447	209.3	151.4	14860	L07-054
AVL-M	26	YKN07000033	716460	33.86	72.36	10.27	55.45	8.15	124	355.1	2465	203.6	156	14855	L07-054
AVL-M	27	YKN07000021R	716165	29.61	69.17	8.78	53.51	6.97	132.4	364.7	2644	201.3	118.7	17306	L07-052
AVL-M	28	YKN07000021R	716180	30.01	68.82	8.96	52.59	7.17	126.7	357.8	2524	201.4	112.6	16195	L07-052
AVL-M	29	YKN07000021R	716195	30.75	70.93	9.31	55.09	7.38	131	371.9	2580	207.5	120	16347	L07-052
AVL-M	30	YKN07000043	684710	32.6	76.29	9.92	58.63	7.93	130.7	385.4	2608	216.7	122.7	16892	L07-063
AVL-M	31	YKN08000108	793200	33.04	77.94	10.1	56.11	8	129.2	356.3	2290	188.4	133.3	15999.3	L08-068
AVL-M	32	YKN08000108	793250	33.37	79.37	10.05	57.79	8.06	128.9	356.9	2302.4	187.6	136.2	16278.8	L08-068
AVL-M	33	YKN08000107	793121	36.13	79.14	11.01	58.65	8.68	135.3	377.5	2488.9	199.3	148.2	17321.4	L08-066
AVL-M	34	YKN08000107	793147	37.17	80.87	11.22	61.69	9.2	133.8	390.5	2574.5	196.3	157.5	16969.3	L08-066
AVL-M	35	YKN08000114	793525	32.64	73.71	9.98	53.65	7.98	132.6	350.3	2289.5	184.5	140	15930.1	L08-071
AVL-M	36	YKN08000114	793550	35.13	77.08	10.53	58.51	8.51	132.6	366	2384.6	190.8	156.3	15958.9	L08-072
AVL-M	37	YKN08000114	793625	31.52	69.85	9.33	52.64	7.65	118.6	333.8	2140.3	174	133.8	14904.4	L08-072
AVL-M	38	YKN08000117	793300	34.8	74.45	10.35	58.37	8.44	124.5	330.9	2241.4	175.1	143.7	14782.8	L08-069
AVL-M	39	YKN08000117	793425	37.21	80.6	11.09	62.76	8.92	133	367	2393.5	191	146.8	15940.8	L08-070
AVL-M	40	YKN08000122	793950	32.56	72.01	9.69	55.18	8.06	130.9	348.1	2261	179.9	141.7	15855.5	L08-075A
AVL-M	41	YKN08000122	793976	34.99	77.75	10.66	59.27	8.53	132.1	370.7	2343.2	191.9	146.4	16174.5	L08-076
AVL-M	42	YKN08000122	794525	34.28	75.57	10.5	58.51	8.53	132.4	373	2336.5	192.3	142.7	16947.7	L08-076
AVL-M	43	YKN08000122	794575	34.5	75.98	10.31	58.2	8.35	130.1	367.4	2293.1	191.8	137.7	16332.7	L08-076
AVL-M	44	YKN08000122	794625	36.8	81.73	10.85	62.82	8.98	140.2	386.9	2494.6	202.4	155.8	17481.3	L08-077
AVL-M	45	YKN08000125	794750	34.8	75.5	10.39	57.83	8.55	126.9	360.5	2318.7	188.5	141.4	15781.5	L08-078
AVL-M	46	YKN08000125	794800	33.07	73.76	10.19	56.84	8.23	128.6	349.9	2253.7	183.3	148.5	16003.8	L08-079
AVL-M	47	YKN08000132	795275	35.57	78.64	10.66	58.26	8.62	135	370.4	2417.4	194.7	161.7	16051.6	L08-084
AVL-M	48	YKN08000132	795300	33.21	73.85	10.09	56.75	8.14	131.2	359.4	2227.3	188	159.2	15915.7	L08-084

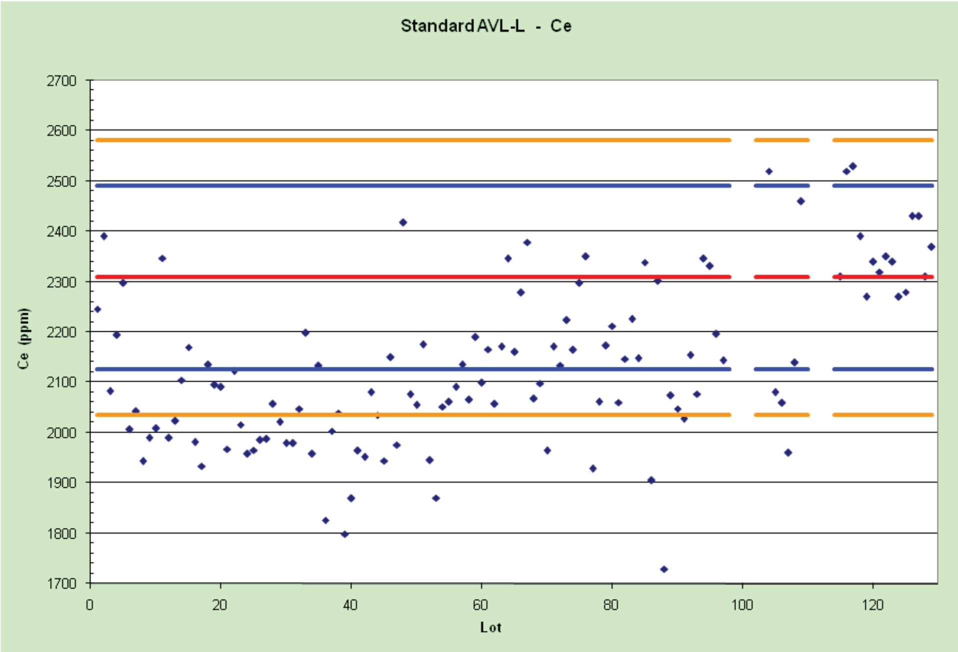
STD_cor	Lot #	WO	Samp_id	Date	STD_orig	WT	Y	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy
AVL-M	49	YKN08000132	795325	29-May-08	AVL-M	0.1	793.1	1568.1	3418.9	460.37	1773.2	322.68	38.53	273.35	38.05	191.19
AVL-M	50	YKN08000132	795400	29-May-08	AVL-M	0.1	855.4	1581.6	3474	485.45	1885.5	340.75	39.81	293.6	41.18	200.29
AVL-M	51	YKN08000132	795475	29-May-08	AVL-M	0.1	818.5	1581.1	3443.6	482.28	1899.3	343.27	41.53	314.95	42.03	210.71
AVL-M	52	YKN08000111	793575	2-Jun-08	***UNK***	1	753.6	1506.5	3079.8	428.45	1624.3	295.59	35.46	257.3	36.04	174.81
AVL-M	53	YKN08000119	793726	2-Jun-08	AVL-M	1	838.3	1533.3	3414.3	473.44	1818.8	330.68	39.88	295.8	40.36	202.99
AVL-M	54	YKN08000119	793775	2-Jun-08	AVL-M	1	817.7	1522.4	3382.4	461.87	1807	322.73	38.79	296.07	39.6	196.05
AVL-M	55	YKN08000134	795675	2-Jun-08	AVL-M	0.11	933.6	1752.6	3471.7	506.68	1975	346.75	42.73	303.33	42.74	206.47
AVL-M	56	YKN08000134	795700	2-Jun-08	AVL-M	0.11	891.2	1717.6	3362.8	496.51	1854.5	333.04	40.48	280.91	40.03	198.34
AVL-M	57	YKN08000130	795025	6-Jun-08	AVL-M	0.1	816.4	1481.8	3196.7	453.29	1739.9	311.22	37.46	275.62	38.17	187.11
AVL-M	58	YKN08000130	795125	6-Jun-08	AVL-M	0.1	779.4	1548	3363.1	460.55	1770	318.25	37.93	283.19	38.46	194.88
AVL-M	59	YKN08000137	795900	14-Jun-08	AVL-M	0.1	774.6	1502.6	3340.8	448.34	1777.5	318.81	37.44	288.95	36.64	187.48
AVL-M	60	YKN08000140	796300	7-Jul-08	AVL-M	4.57	804.8	1538.2	3199.4	440.39	1668.4	309.56	36.71	282.63	36.86	183.57
AVL-M	61	YKN08000140	796325	7-Jul-08	AVL-M	0.11	848.8	1613.8	3322.1	471.58	1852.8	322.47	38.55	276.46	37.53	188.43
AVL-M	62	YKN08000140	796425	7-Jul-08	AVL-M	0.11	861.1	1640.5	3578.2	472.83	1847.5	329.2	39.44	292.1	37.66	191.52
AVL-M	63	YKN08000140	796450	7-Jul-08	AVL-M	0.1	769.7	1514	3398.2	452.39	1750.9	315.3	38.02	294.28	37.35	189.49
AVL-M	64	YKN08000155	796500	25-Jul-08	AVL-M	0.1	795.1	1600.2	3375.6	466.05	1798.3	319.49	38.64	276.7	38.84	189.35
AVL-M	65	YKN08000155	796525	25-Jul-08	AVL-M	0.1	807.6	1596.9	3399.8	468.91	1790.2	328.46	39.11	278.37	39.7	194.25
AVL-M	66	YKN08000155	796575	25-Jul-08	AVL-M	0.1	851.6	1620.9	3419.8	471.32	1818.8	329.23	39.2	280.36	39.26	192.01
AVL-M	67	YKN08000155	796600	25-Jul-08	AVL-M	0.1	792.9	1530.7	3234.3	448.38	1713.1	311.54	37.95	264.44	37.76	186.03
AVL-M	68	YKN08000129	794975	28-Jul-08	AVL-M	0.1	787.8	1462.5	3250.8	452.05	1747.9	315.92	37.18	277.16	38.06	192.33
AVL-M	69	YKN08000162	796875	5-Aug-08	***AVL-L***	0.11	845.1	1689.7	3894.7	493.88	1959.2	360.5	41.91	322.18	42.79	220.14
AVL-M	70	YKN08000162	796950	5-Aug-08	***BLANK***	0.11	808	1434.5	3254.5	441.28	1790.2	329.53	37.5	281.51	39.49	199.48
AVL-M	71	YKN08000138	796150	12-Aug-08	AVL-M	0.11	802.8	1570.9	3574.8	452.23	1774.3	316	36.9	272.37	36	188.55
AVL-M	72	YKN08000138	796200	12-Aug-08	AVL-M	0.1	714	1537.2	3366.6	416.04	1683.8	292.73	34.31	279.66	34.21	172.03
AVL-M	73	YKN08000138	796250	12-Aug-08	AVL-M	0.1	796.2	1593.3	3295.4	455.05	1768.5	314.7	37.66	289.08	37.1	186.02
AVL-M	74	YKN08000163	712075	21-Aug-08	AVL-M	5.53	846.7	1691	3667.4	491.62	1922.1	349.52	40.35	335.13	39.76	204.38
AVL-M	75	YKN08000158	796700	5-Sep-08	AVL-M	0.11	861.8	1615.4	3326	455.78	1794.9	322.26	38.04	289.74	37.82	186.56
AVL-M	76	YKN08000158	796750	5-Sep-08	***UNK***	0.1	785.6	1559.2	3219.5	437.32	1711.3	300.71	35.65	256.37	35.46	183.39
AVL-M	77	YKN08000158	796775	5-Sep-08	AVL-M	0.11	833.8	1634.5	3669.4	473	1834.4	337.31	40.53	305.18	40.46	198.27
AVL-M	78	YKN08000167	712175	9-Sep-08	AVL-M	0.11	836.2	1630.1	3998.1	475.23	1901.3	344.62	39.02	338.55	38.65	203.27
AVL-M	79	YKN08000167	712232	9-Sep-08	AVL-M	0.1	756.3	1532.2	3820.3	443.57	1811.4	324.98	37.41	319.43	35.95	196.52
AVL-M	80	YKN08000167	712325	9-Sep-08	AVL-M	0.1	930.1	1770.4	3529.9	502.01	1894.9	341.67	41.31	334.22	40.96	203.32
AVL-M	81	YKN08000167	712350	9-Sep-08	***AVL-H***	0.11	763.7	1562.8	3772.2	448.48	1833.2	321.09	36.65	315.37	35.91	188.87
AVL-M	82	YKN08000176	712650	10-Sep-08	AVL-M	0.11	861.5	1544.3	3491.8	467.48	1806.7	333.52	38.45	308.21	40.09	198.28
AVL-M	83	YKN08000176	712700	10-Sep-08	***UNK***	0.11	820.8	1547.3	3456	455.24	1793.6	323.12	37.99	286.64	37.48	187.72
AVL-M	84	YKN08000176	712725	10-Sep-08	AVL-M	0.11	813.7	1677.7	3673.7	468.35	1876	340.53	39.36	327.54	39.48	200.45
AVL-M	85	YKN08000176	712775	10-Sep-08	***UNK***	0.1	787	1613.5	3551.1	458.34	1829	328.29	39.02	322.4	38.97	197.71
AVL-M	86	YKN08000133	795575	12-Sep-08	AVL-M	0.12	750.1	1448.5	3118.9	425.72	1661.6	298.33	35.28	253.79	35.2	175.86
AVL-M	87	YKN08000168	712400	8-Oct-08	AVL-M	0.1	728.9	1625.7	3706.4	429.26	1785.8	309.86	36.01	294.9	36.38	183.37
AVL-M	88	YKN08000168	712475	8-Oct-08	AVL-M	0.1	827.8	1422.8	3203.7	447.5	1759.4	333.79	39.11	296.56	39.25	194.81
AVL-M	89	YKN08000168	712575	8-Oct-08	AVL-M	0.1	722.9	1460.7	3637.8	420.21	1748.1	315.72	35.91	299.31	35.51	184.06
							Y	**La**	**Ce**	**Pr**	**Nd**	**Sm**	**Eu**	**Gd**	**Tb**	**Dy**
Min							694.7	1366.6	3079.8	408.13	1624.3	292.73	34.31	201.3	33.99	172.03
Mean							**817.78**	**1614.11**	**3505.03**	**467.36**	**1819.43**	**326.54**	**38.56**	**276.17**	**38.63**	**194.20**
Max							933.6	1853	3998.1	520.2	2036	365.7	43.09	338.55	42.79	220.14

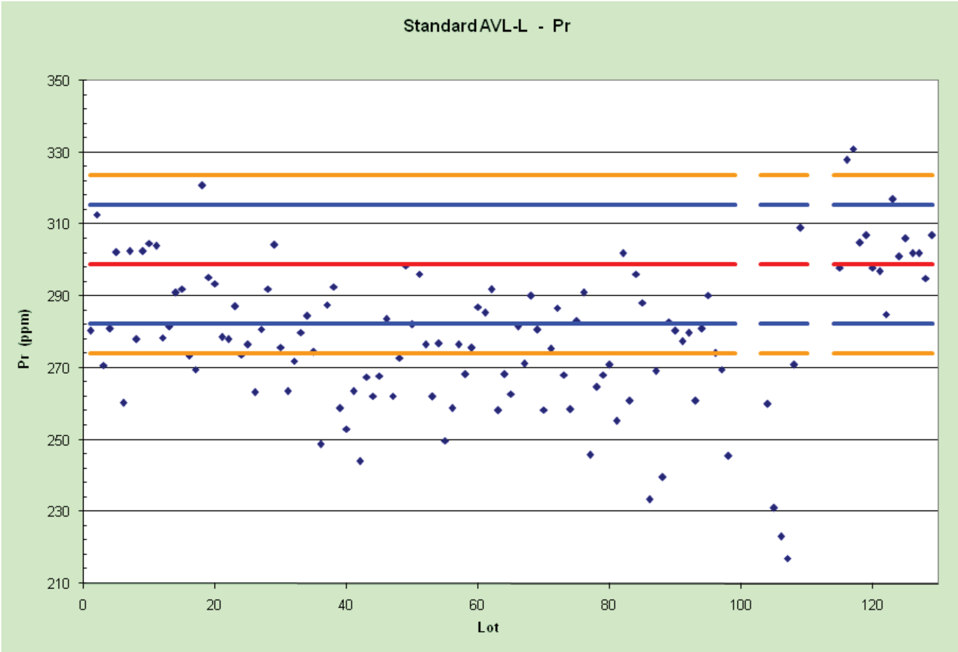
STD_cor	Lot #	WO	Samp_id	Ho	Er	Tm	Yb	Lu	Ga	Hf	Nb	Ta	Th	Zr	Hole_id
AVL-M	49	YKN08000132	795325	32.87	72.32	9.96	55.7	8	130.8	349.8	2284.5	184.7	154	16268.2	L08-085
AVL-M	50	YKN08000132	795400	34.82	78.05	10.87	59.48	8.52	133.8	375	2441.4	197.2	159.5	17358	L08-085
AVL-M	51	YKN08000132	795475	36.64	79.91	10.77	60.29	8.7	137.9	375.1	2360.7	192.7	145.6	16517.8	L08-086
AVL-M	52	YKN08000111	793575	30.44	69.14	9.21	50.7	7.49	121.8	329.4	2204.8	164.2	147.8	13709.8	L08-072
AVL-M	53	YKN08000119	793726	34.44	77.68	10.69	58.18	8.61	134.9	371.3	2348.9	195	154.9	16435	L08-073
AVL-M	54	YKN08000119	793775	33.56	75.03	10.25	56.77	8.39	131.6	352.7	2268.1	185.6	144.2	15692.9	L08-074
AVL-M	55	YKN08000134	795675	36.29	81.51	10.97	60.46	8.79	136.7	382.6	2559.8	218.6	152.2	18029.2	L08-088
AVL-M	56	YKN08000134	795700	34.73	80.22	10.54	57.52	8.35	132.3	370.3	2377	212.6	145.9	16636.2	L08-088
AVL-M	57	YKN08000130	795025	32.37	72.78	9.85	54.39	7.93	127.8	338.1	2201.8	175.9	142.9	15891.5	L08-081
AVL-M	58	YKN08000130	795125	32.85	73.33	9.79	55.21	7.93	131	358	2218.5	186.2	142.4	16040.3	L08-082
AVL-M	59	YKN08000137	795900	31.11	71.35	9.43	55.47	7.75	132.8	353.7	2299.6	196.3	134	15716.6	L08-090
AVL-M	60	YKN08000140	796300	31.69	72.22	9.31	54.69	7.67	130.2	350.1	2298.4	199.9	130.2	16606.7	L08-095
AVL-M	61	YKN08000140	796325	32.28	71.91	9.62	55.66	7.79	133	366.2	2483.6	208.2	137.5	16234.6	L08-095
AVL-M	62	YKN08000140	796425	32.28	74.22	9.82	56.6	7.91	138.3	393.9	2705.6	220.1	142.5	17223.9	L08-096
AVL-M	63	YKN08000140	796450	31.59	72.21	9.49	55.64	7.68	137.8	361.3	2468.3	209.3	137.7	17029.3	L08-096
AVL-M	64	YKN08000155	796500	33.25	74.52	9.96	55.13	7.97	133.4	362.1	2253.9	206.5	140.1	16307.8	L08-097
AVL-M	65	YKN08000155	796525	33.33	77.1	10.3	55.9	8.08	128.4	349.8	2265.4	199.3	143.8	16143.8	L08-097
AVL-M	66	YKN08000155	796575	32.9	75.41	10.12	56.62	8.06	130.4	358.4	2343.3	209.2	141.7	16632.6	L08-098
AVL-M	67	YKN08000155	796600	32.04	72.79	9.89	53.99	7.78	130.9	353.3	2236	208	137.9	15648.9	L08-098
AVL-M	68	YKN08000129	794975	32.61	72.96	10	54.82	8.06	131.3	341	2206.5	180.8	145.5	14975.9	L08-081
AVL-M	69	YKN08000162	796875	37.44	84.53	11.22	63.46	9.01	143.7	406.1	2678.9	226.4	155.3	17381.5	L08-101
AVL-M	70	YKN08000162	796950	33.51	73.26	9.73	55.9	8.24	131	328.1	2286.6	190.5	144.5	17751.7	L08-102
AVL-M	71	YKN08000138	796150	31.26	72.26	9.32	54.1	7.49	134.7	364.9	2516.4	216.4	132.3	16605.4	L08-092
AVL-M	72	YKN08000138	796200	28.56	65.29	8.74	50.69	7.23	134.1	335.8	2300.2	192.7	122.2	16825.3	L08-093
AVL-M	73	YKN08000138	796250	31.77	72.97	9.56	54.31	7.62	125	364.4	2382.6	200.3	141.4	16022.7	L08-094
AVL-M	74	YKN08000163	712075	34.09	78.23	10.28	59.86	8.32	139.4	378.2	2517.5	204.6	140.6	17176.7	L08-103
AVL-M	75	YKN08000158	796700	31.49	73.1	9.69	55.1	7.69	139.4	352.8	2381.6	206.2	135.4	16659.9	L08-099
AVL-M	76	YKN08000158	796750	30.83	69.18	9.23	51.8	7.35	131.1	337.2	2270.7	197.8	128.6	15271.6	L08-099
AVL-M	77	YKN08000158	796775	33.76	76.72	10.56	60.77	8.58	138.6	385.4	2590.6	219.2	148.4	16773.3	L08-099
AVL-M	78	YKN08000167	712175	32.37	75.23	9.98	60.13	8.07	136.9	403.2	2562	223.4	137.9	18257	L08-103
AVL-M	79	YKN08000167	712232	31.21	71.68	9.45	57.11	7.66	118.9	365.5	2388.9	200.1	109.4	19161.5	L08-104
AVL-M	80	YKN08000167	712325	35	80.43	10.77	60.18	8.56	139.6	382.4	2464	185.6	142	16145.2	L08-105
AVL-M	81	YKN08000167	712350	30.32	70.96	9.1	55.11	7.36	136.2	345	2449.2	195	122.3	16773.8	L08-105
AVL-M	82	YKN08000176	712650	33.43	72.92	10.14	57.34	8.22	139.3	364.4	2480.2	194.2	150.2	15530.4	L08-108
AVL-M	83	YKN08000176	712700	31.84	72.77	9.63	55.36	7.76	130.3	366.7	2488.3	204	132.4	16582.7	L08-109
AVL-M	84	YKN08000176	712725	33.27	75.72	10.19	58.87	8.15	134.4	374.7	2502.3	209.4	136.3	16922.7	L08-109
AVL-M	85	YKN08000176	712775	32.87	75.86	10	58.33	8.12	132.6	366.4	2493.6	207.6	137.1	16828.4	L08-109
AVL-M	86	YKN08000133	795575	30.52	68.19	9.18	51.11	7.36	116.4	323.4	2109.9	182.1	133.9	14266	L08-087
AVL-M	87	YKN08000168	712400	30.39	70.03	9.31	53.7	7.56	132.6	375.1	2729.1	207.2	120.7	17405.7	L08-106
AVL-M	88	YKN08000168	712475	33.12	76.09	10.17	57.83	8.29	139.3	350.3	2199.6	190.9	145.3	15604.3	L08-106
AVL-M	89	YKN08000168	712575	29.53	69.56	9	54.23	7.36	127.5	354.9	2275.2	197.8	117.8	16735.2	L08-107

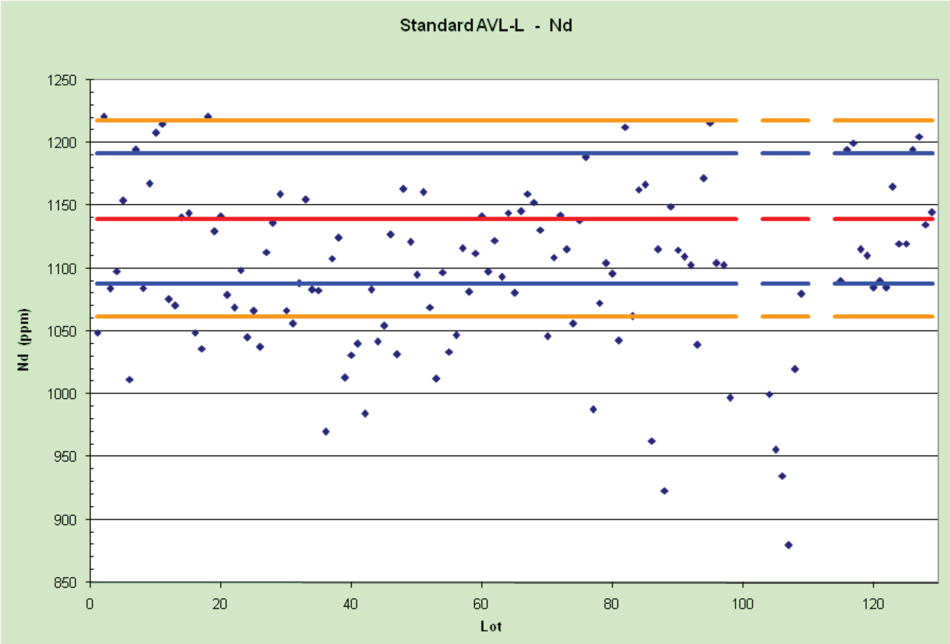
	Ho	Er	Tm	Yb	Lu	Ga	Hf	Nb	Ta	Th	Zr
Min	28.56	65.29	8.74	50.69	6.97	116.4	323.4	1836	164.2	109.4	12884
Mean	**33.12**	**74.43**	**10.01**	**56.55**	**8.06**	**132.04**	**363.4**	**2416.1**	**199.94**	**140.23**	**16046.50**
Max	37.44	84.53	11.22	63.46	9.2	143.7	406.1	2729.1	226.4	165.6	19161.5


Standard AVL-L - Y
Y (ppm)
Lot

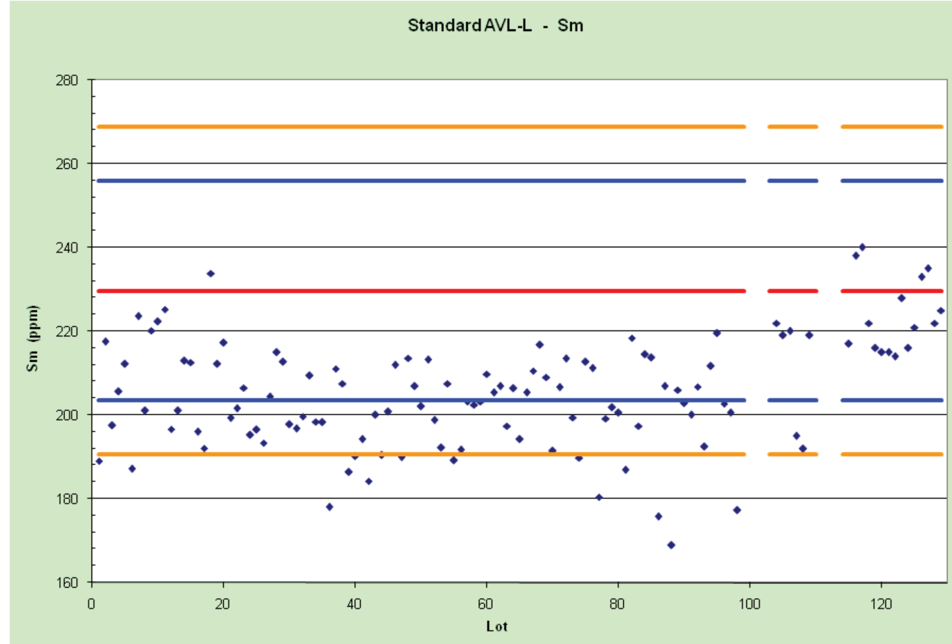

Standard AVL-L - La
La (ppm)
Lot


Standard AVL-L - Ce
Ce (ppm)
Lot

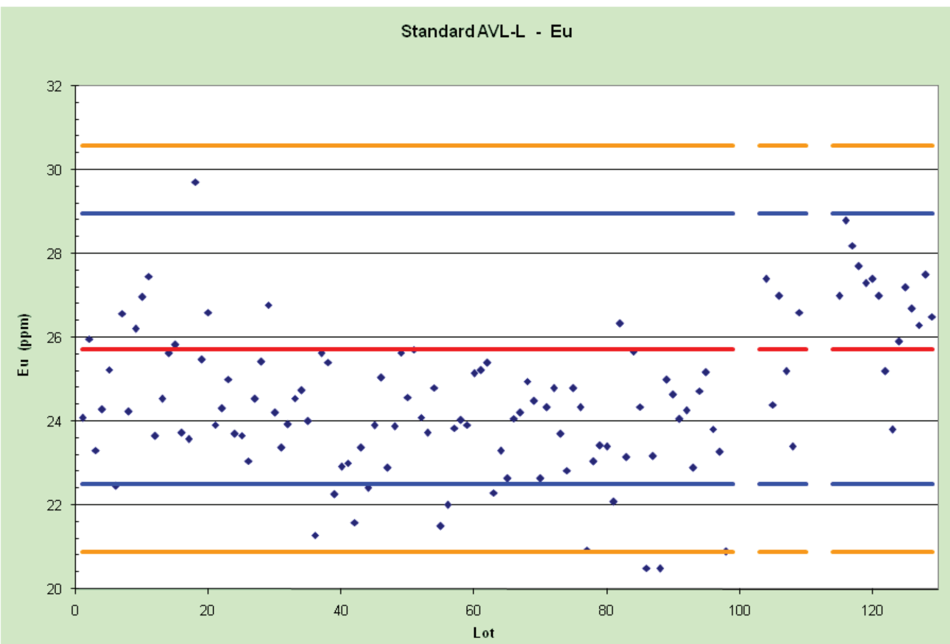

Standard AVL-L - Pr
Pr (ppm)
Lot



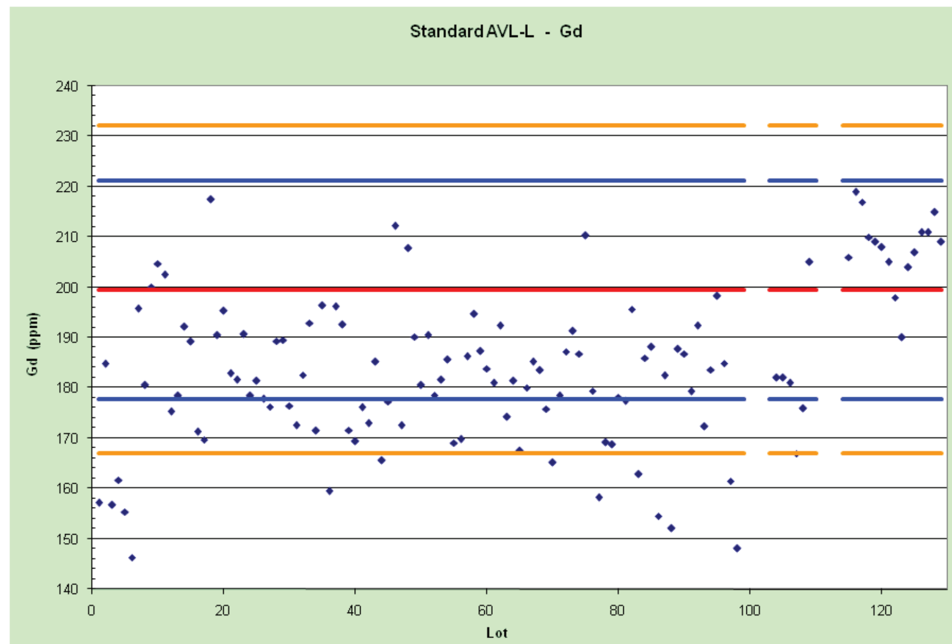
Standard AVL-L - Nd
Nd (ppm)
Lot



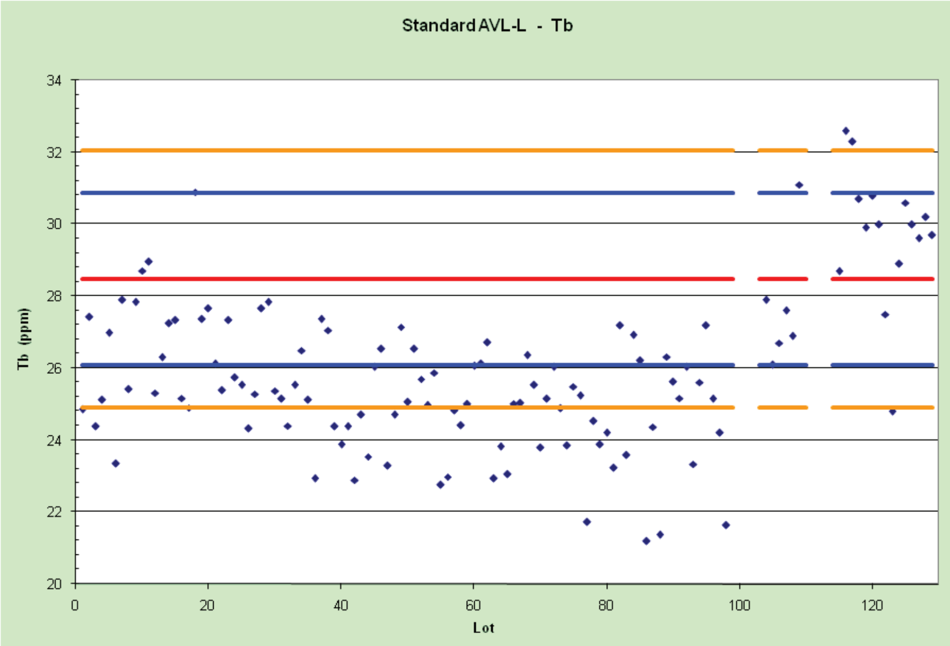
Standard AVL-L - Sm
Sm (ppm)
Lot

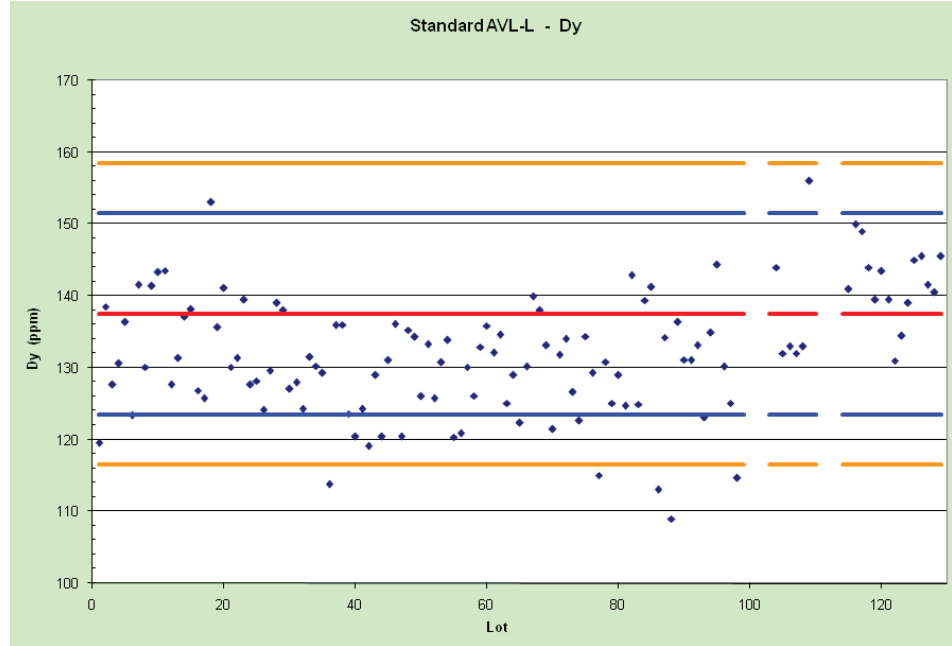


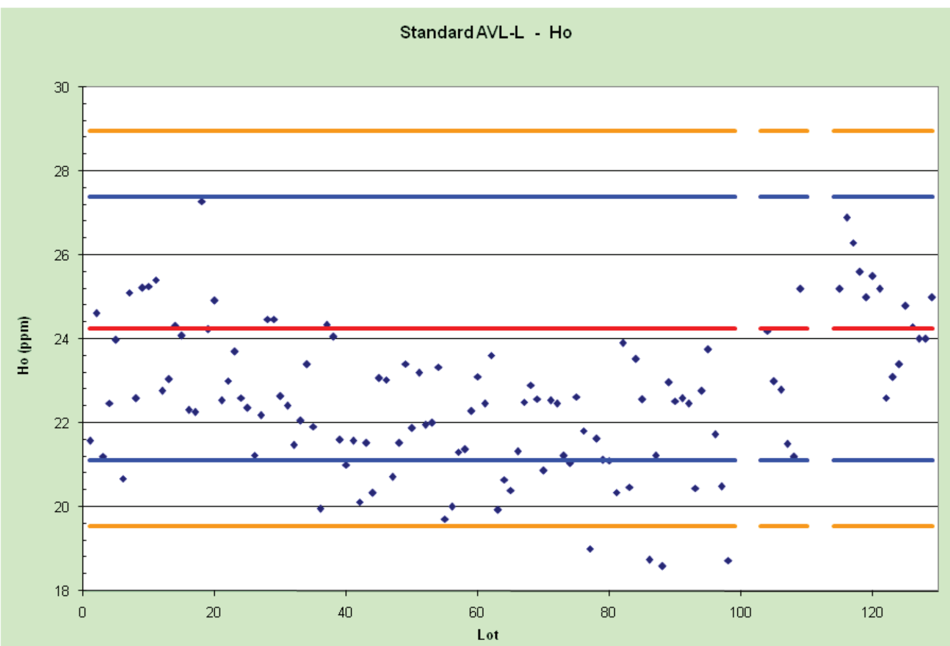
Standard AVL-L - Eu
Eu (ppm)
Lot

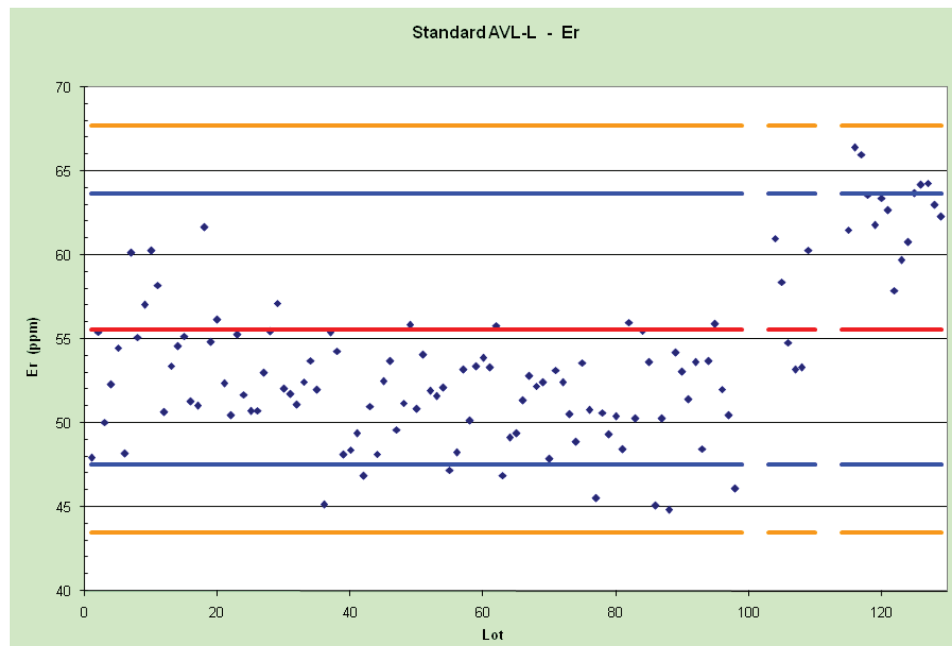


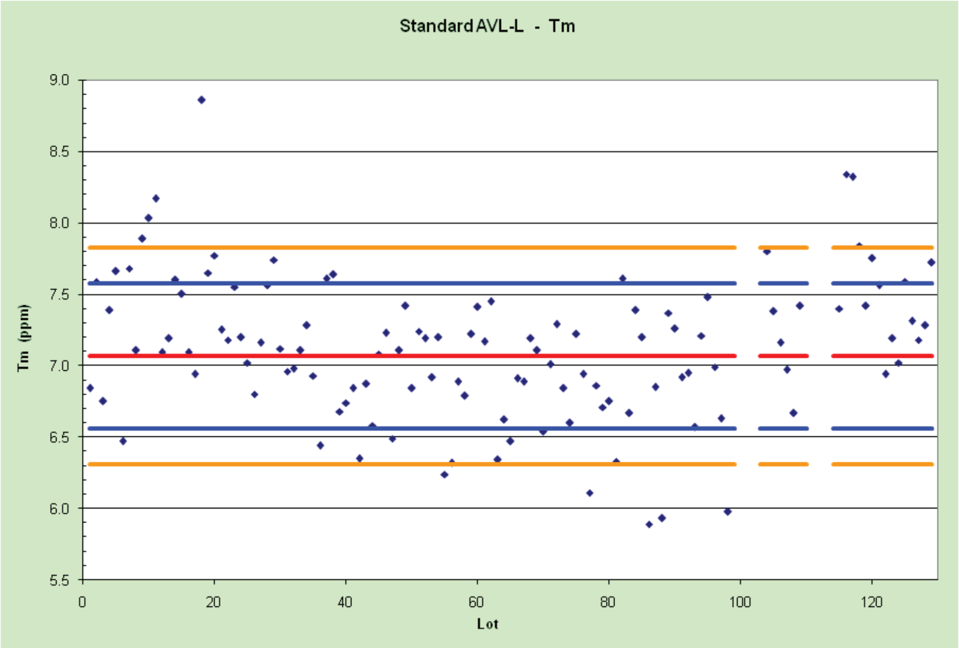
Standard AVL-L - Gd
Gd (ppm)
Lot

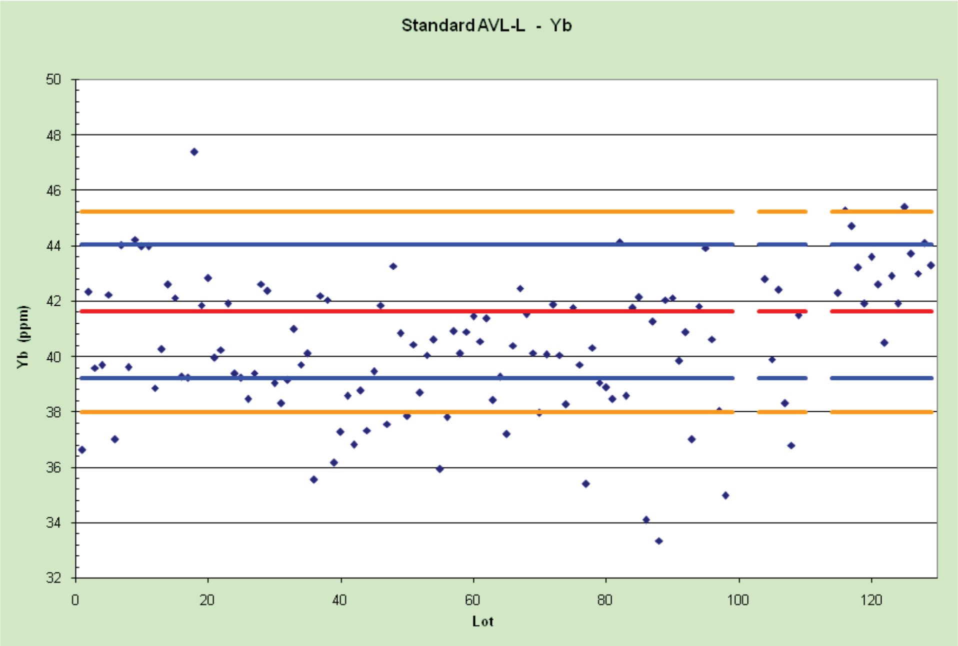

Standard AVL-L - Tb
Tb (ppm)
Lot
34
32
30
28
26
24
22
20
0
20
40
60
80
100
120

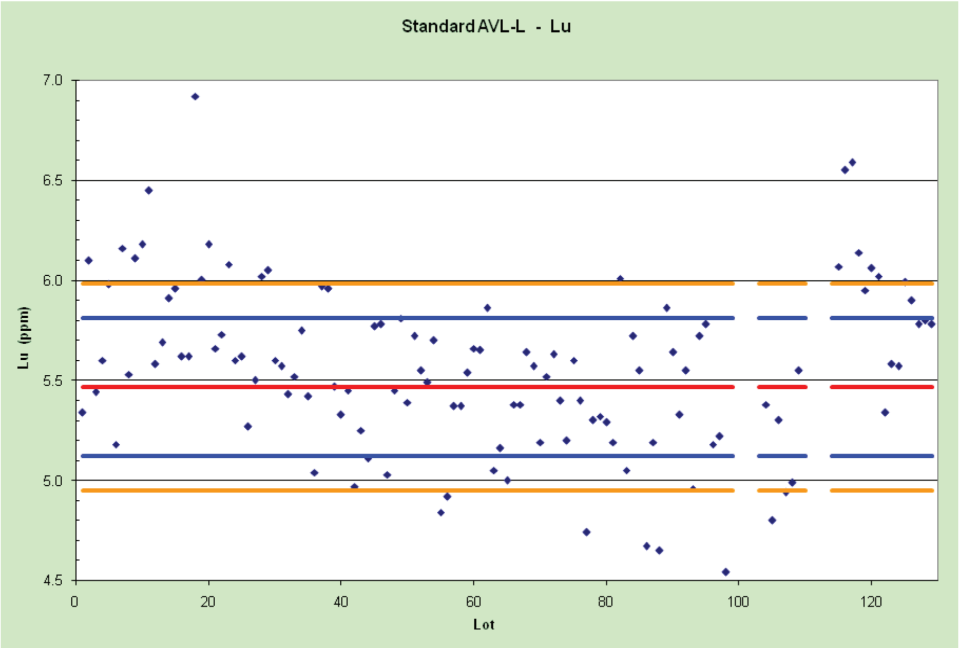

Standard AVL-L - Dy
Dy (ppm)
Lot
170
160
150
140
130
120
110
100
0
20
40
60
80
100
120

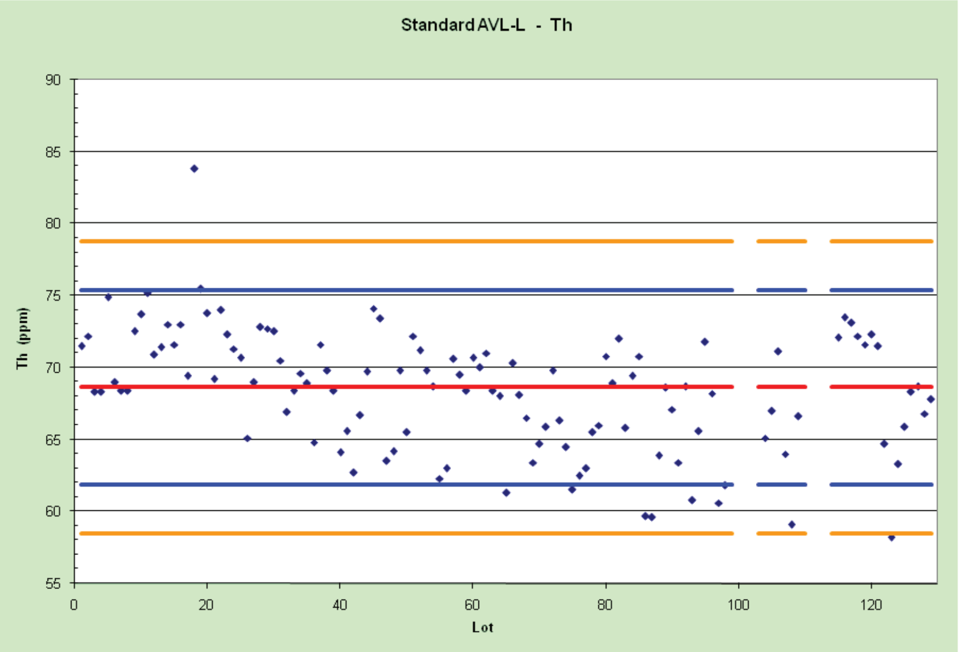

Standard AVL-L - Ho
Ho (ppm)
Lot
30
28
26
24
22
20
18
0
20
40
60
80
100
120

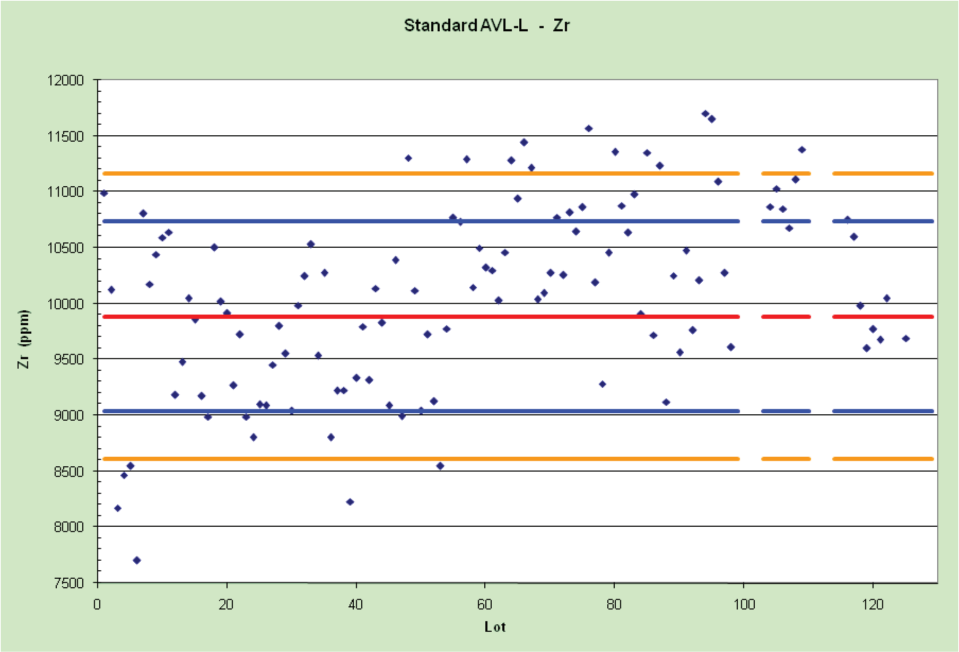

Standard AVL-L - Er
Er (ppm)
Lot
70
65
60
55
50
45
40
0
20
40
60
80
100
120


Standard AVL-L - Tm
Tm (ppm)
Lot

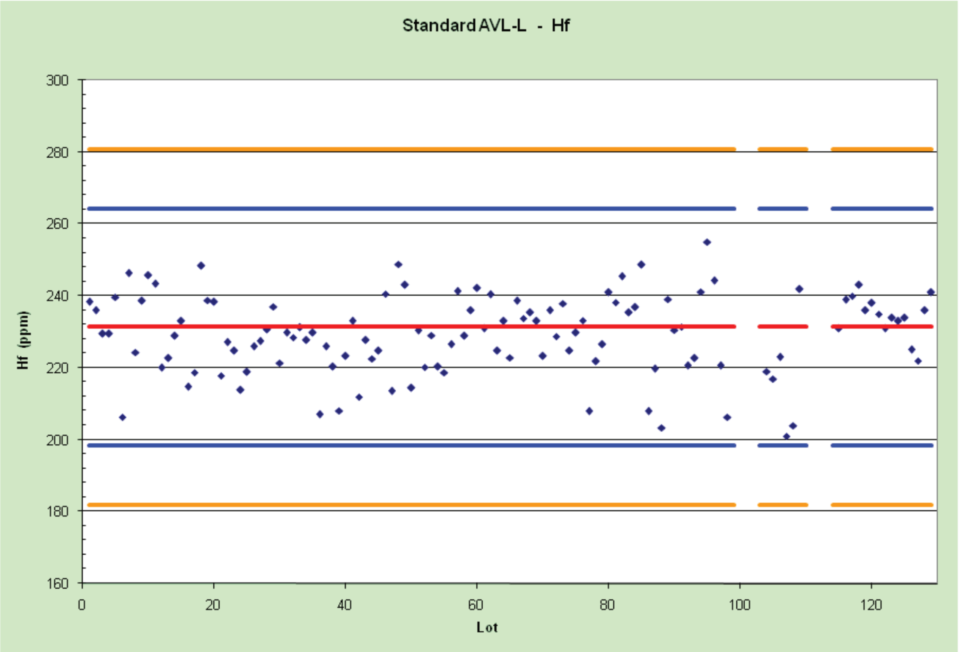

Standard AVL-L - Yb
Yb (ppm)
Lot


Standard AVL-L - Lu
Lu (ppm)
Lot

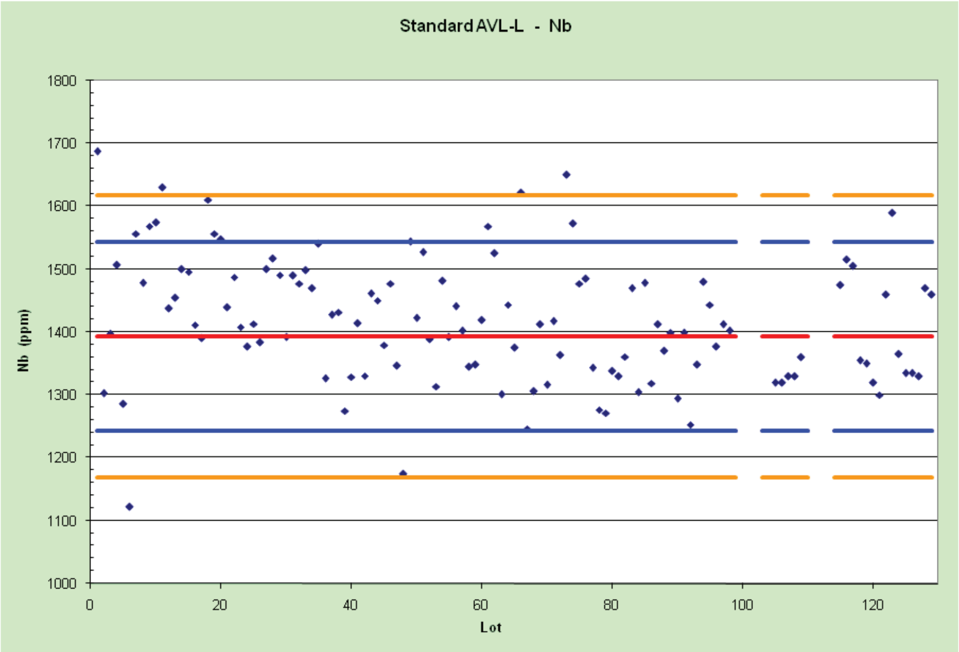

Standard AVL-L - Th
Th (ppm)
Lot



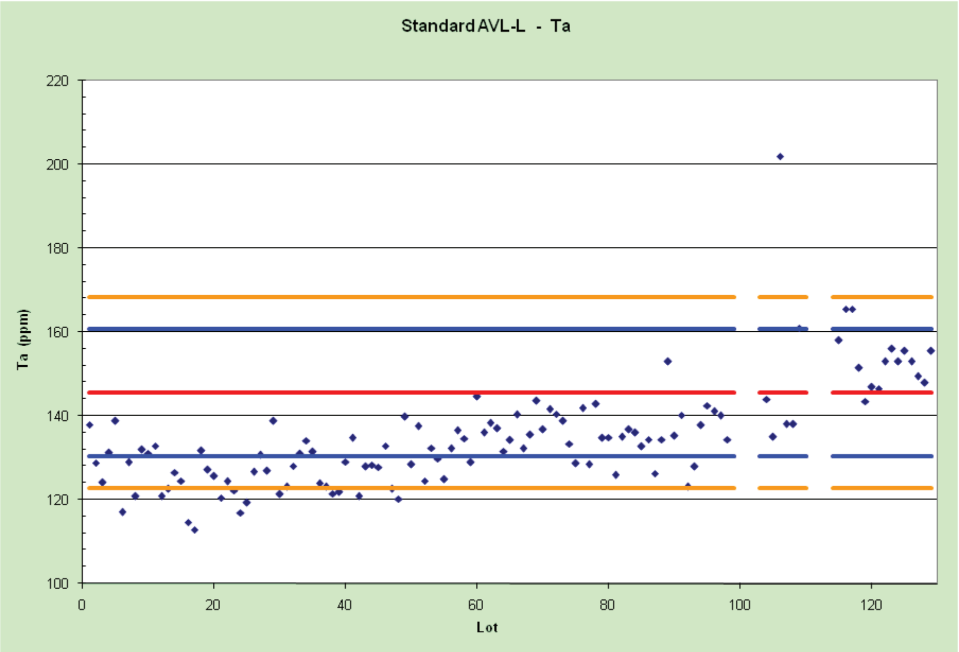
Standard AVL-L - Zr
12000
11500
11000
10500
10000
9500
9000
8500
8000
7500
Zr (ppm)
0
20
40
60
80
100
120
Lot



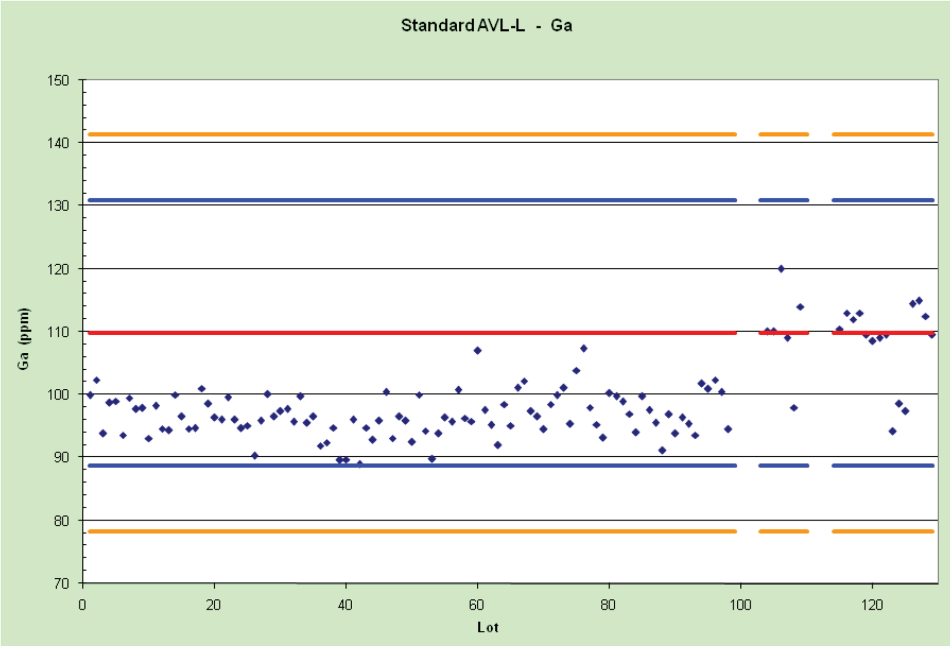
Standard AVL-L - Hf
300
280
260
240
220
200
180
160
Hf (ppm)
0
20
40
60
80
100
120
Lot



Standard AVL-L - Nb
1800
1700
1600
1500
1400
1300
1200
1100
1000
Nb (ppm)
0
20
40
60
80
100
120
Lot



Standard AVL-L - Ta
220
200
180
160
140
120
100
Ta (ppm)
0
20
40
60
80
100
120
Lot


Standard AVL-L - Ga
Ga (ppm)
150
140
130
120
110
100
90
80
70
0
20
40
60
80
100
120
Lot

STD_cor	Lot #	WO	Samp_id	Date	STD_orig	WT	Y	La	Ce	Pr	Nd	Sm
AVL-L	1	YKN07000040	684530	18-Dec-07	AVL-L		582.4	1006	2246	280.3	1049	189.1
AVL-L	2	YKN07000040	717000	18-Dec-07	AVL-L		627.8	1113	2391	312.7	1221	217.5
AVL-L	3	YKN07000042	684650	20-Dec-07	AVL-L		569.5	958.2	2082	270.8	1084	197.5
AVL-L	4	YKN07000036	716790	21-Dec-07	AVL-L		583.8	1011	2195	281	1098	205.6
AVL-L	5	YKN07000039	716880	31-Jan-08	AVL-L		615.6	1085	2298	302.3	1154	212.3
AVL-L	6	YKN07000039	716910	31-Jan-08	AVL-L		542.1	936.9	2006	260.3	1012	187.1
AVL-L	7	YKN08000108	793225	10-Apr-08	AVL-L		515.8	949.4	1942.8	277.94	1084.5	201.1
AVL-L	8	YKN08000108	793175	10-Apr-08	AVL-L		560.9	1029.4	2042.3	302.52	1194.7	223.55
AVL-L	9	YKN08000117	793390	2-May-08	AVL-L		582.7	1046	2008.5	304.74	1208	222.4
AVL-L	10	YKN08000117	793275	2-May-08	AVL-L		575.3	1014.9	1990.3	302.55	1167.7	220.24
AVL-L	11	YKN08000115	793475	5-May-08	AVL-L	0.1	565.4	1013.3	2347.3	304.1	1215.4	225.27
AVL-L	12	YKN08000122	793926	9-May-08	AVL-L	0.1	552.5	947.2	1990.4	278.43	1075.6	196.63
AVL-L	13	YKN08000122	794000	9-May-08	AVL-L	0.1	559.3	953.6	2023.1	281.63	1070.4	201.18
AVL-L	14	YKN08000122	794600	9-May-08	AVL-L	5	587.4	959	2104.6	290.97	1140.5	212.93
AVL-L	15	YKN08000125	794675	22-May-08	AVL-L	0.1	566.3	993.6	2170.1	292.06	1144.1	212.59
AVL-L	16	YKN08000125	794825	22-May-08	AVL-L	0.1	533.8	907.7	1934.1	269.65	1036.3	192.15
AVL-L	17	YKN08000125	794700	22-May-08	AVL-L	0.1	553	949.3	1981.1	273.47	1049	196.07
AVL-L	18	YKN08000132	795375	29-May-08	AVL-L	0.1	586.2	1010.5	2095.4	295.27	1129.7	212.22
AVL-L	19	YKN08000132	795225	29-May-08	AVL-L	0.1	646.6	1076.9	2134.8	320.82	1220.8	233.92
AVL-L	20	YKN08000134	795750	2-Jun-08	AVL-L	0.11	529.9	918.6	1986.1	263.2	1037.9	193.39
AVL-L	21	YKN08000134	795825	2-Jun-08	AVL-L	0.1	574.4	980.7	1987.1	280.79	1113.1	204.39
AVL-L	22	YKN08000119	793850	2-Jun-08	AVL-L	1	554.5	942.1	1965.6	276.57	1066.1	196.62
AVL-L	23	YKN08000111	793650	2-Jun-08	AVL-L	1	562.4	947.1	1967.9	278.71	1079.1	199.26
AVL-L	24	YKN08000119	793800	2-Jun-08	AVL-L	1	569.1	956	2016.2	287.16	1098.9	206.51
AVL-L	25	YKN08000119	793825	2-Jun-08	AVL-L	1	534.2	921.6	1957.9	273.73	1045	195.31
AVL-L	26	YKN08000111	793600	2-Jun-08	AVL-L	1	578.7	977.3	2090.7	293.49	1141.7	217.33
AVL-L	27	YKN08000111	793675	2-Jun-08	**UNK**	1	573.9	961.9	2123.1	278.02	1069.1	201.66
AVL-L	28	YKN08000130	795150	6-Jun-08	AVL-L	0.1	543.5	951.9	1979.6	275.85	1066.7	197.77
AVL-L	29	YKN08000130	795050	6-Jun-08	AVL-L	0.1	582.1	981.4	2057	292.04	1136.2	215.05
AVL-L	30	YKN08000130	795075	6-Jun-08	AVL-L	0.1	618.7	1059.9	2020.8	304.33	1159.2	212.8
AVL-L	31	YKN08000137	796050	14-Jun-08	AVL-L	1	553.8	955.2	2047.6	271.94	1088.4	199.73
AVL-L	32	YKN08000137	796100	14-Jun-08	AVL-L	0.11	536	985.2	2199	279.97	1155.1	209.44
AVL-L	33	YKN08000137	795950	14-Jun-08	AVL-L	0.11	543.6	860.9	1979.3	263.48	1056	196.74
AVL-L	34	YKN08000140	796375	7-Jul-08	AVL-L	0.1	598.2	999.4	1957.5	284.46	1083.4	198.42
AVL-L	35	YKN08000155	796550	25-Jul-08	AVL-L	0.1	559.8	980.2	2133.7	274.5	1082.8	198.24
AVL-L	36	YKN08000155	796650	25-Jul-08	AVL-L	0.1	494	806.4	1826.1	248.76	970	178.11
AVL-L	37	YKN08000129	794925	28-Jul-08	AVL-L	0.1	575.2	964	2003.5	287.66	1108.1	211.07
AVL-L	38	YKN08000129	794950	28-Jul-08	AVL-L	0.1	584.4	984.5	2039.5	292.65	1124.8	207.55
AVL-L	39	YKN08000162	797000	5-Aug-08	AVL-L	0.11	521.3	882.2	1964.9	263.53	1039.9	194.25
AVL-L	40	YKN08000162	712050	5-Aug-08	AVL-L	0.1	515.1	822.3	1799.1	258.78	1013.2	186.4
AVL-L	41	YKN08000162	796925	5-Aug-08	AVL-L	0.11	504.9	865.3	1869.4	253.1	1031.4	190.26
AVL-L	42	YKN08000138	796178	12-Aug-08	AVL-L	0.11	540.1	922.3	2080.7	267.5	1083.3	200.16
AVL-L	43	YKN08000138	796125	12-Aug-08	AVL-L	0.11	496.4	831.3	1952.3	244.16	984.3	184.25
AVL-L	44	YKN08000138	796225	12-Aug-08	AVL-L	6.49	521.6	943.8	2034.8	262.25	1041.8	190.5
AVL-L	45	YKN08000163	712125	21-Aug-08	AVL-L	0.11	541.5	895.2	1944.1	267.88	1054.7	200.91
AVL-L	46	YKN08000158	796825	5-Sep-08	**UNK**	0.11	536.9	924.9	1976.3	262.25	1031.6	189.9
AVL-L	47	YKN08000158	796725	5-Sep-08	**UNK**	0.1	553.3	966.4	2150.6	283.63	1126.9	212.05
AVL-L	48	YKN08000167	712275	9-Sep-08	AVL-L	0.11	515.7	925.2	2417.6	272.91	1163.6	213.6
AVL-L	49	YKN08000176	712600	10-Sep-08	AVL-L	0.1	603.8	1023.7	2075.6	298.54	1121	206.93
AVL-L	50	YKN08000133	795550	12-Sep-08	AVL-L	0.1	609.2	1029.7	2174.7	296.18	1160.9	213.29
AVL-L	51	YKN08000133	795600	12-Sep-08	AVL-L	0.1	554.3	946.2	1945.5	276.54	1069.2	198.78
AVL-L	52	YKN08000133	795650	12-Sep-08	AVL-L	0.11	561.4	912.2	2052.2	276.9	1097.1	207.54
AVL-L	53	YKN08000133	795525	12-Sep-08	**UNK**	0.11	575	975.5	2054.9	282.2	1095	202.08
AVL-L	54	YKN08000133	795625	12-Sep-08	**UNK**	0.1	524	886	1870.4	262.06	1012.2	192.29
AVL-L	55	YKN08000168	712375	8-Oct-08	AVL-L	0.1	538.1	994.9	2223.3	268.15	1115.1	199.45
AVL-L	56	YKN08000168	712525	8-Oct-08	AVL-L	0.1	544.4	885	2298.4	283.12	1138.5	212.7
AVL-L	57	YKN08000168	712450	8-Oct-08	AVL-L	0.11	534.1	954.1	2164.2	258.49	1056.4	189.83

						Y	La	Ce	Pr	Nd	Sm
Min						494	806.4	1799.1	244.16	970	178.11
Mean						**559.02**	**959.32**	**2059.12**	**279.77**	**1096.01**	**203.23**
Max						646.6	1113	2417.6	320.82	1221	233.92
						57	57	57	57	57	57

STD_cor	Lot #	WO	Samp_id	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
AVL-L	1	YKN07000040	684530	24.08	157.1	24.86	119.5	21.57	47.95	6.84	36.62	5.34
AVL-L	2	YKN07000040	717000	25.97	184.8	27.42	138.5	24.61	55.44	7.59	42.32	6.1
AVL-L	3	YKN07000042	684650	23.31	156.8	24.38	127.7	21.21	50.05	6.75	39.59	5.44
AVL-L	4	YKN07000036	716790	24.28	161.7	25.12	130.6	22.48	52.28	7.39	39.69	5.6
AVL-L	5	YKN07000039	716880	25.24	155.4	26.99	136.4	23.98	54.48	7.66	42.23	5.98
AVL-L	6	YKN07000039	716910	22.46	146.3	23.35	123.4	20.68	48.19	6.47	37	5.18
AVL-L	7	YKN08000108	793225	24.24	180.55	25.42	130.11	22.59	55.11	7.11	39.61	5.53
AVL-L	8	YKN08000108	793175	26.58	195.8	27.9	141.59	25.11	60.13	7.68	44.01	6.16
AVL-L	9	YKN08000117	793390	26.97	204.75	28.71	143.32	25.26	60.26	8.03	43.97	6.18
AVL-L	10	YKN08000117	793275	26.21	200.11	27.84	141.37	25.23	57.04	7.89	44.23	6.11
AVL-L	11	YKN08000115	793475	27.46	202.46	28.95	143.54	25.41	58.22	8.17	43.99	6.45
AVL-L	12	YKN08000122	793926	23.65	175.37	25.31	127.71	22.77	50.67	7.09	38.87	5.58
AVL-L	13	YKN08000122	794000	24.54	178.5	26.31	131.31	23.04	53.41	7.19	40.26	5.69
AVL-L	14	YKN08000122	794600	25.63	192.21	27.24	137.14	24.31	54.56	7.6	42.61	5.91
AVL-L	15	YKN08000125	794675	25.83	189.18	27.33	138.18	24.09	55.18	7.5	42.12	5.96
AVL-L	16	YKN08000125	794825	23.57	169.69	24.9	125.77	22.27	51.04	6.94	39.23	5.62
AVL-L	17	YKN08000125	794700	23.73	171.24	25.16	126.86	22.31	51.27	7.09	39.28	5.62
AVL-L	18	YKN08000132	795375	25.47	190.44	27.37	135.61	24.24	54.83	7.65	41.85	6
AVL-L	19	YKN08000132	795225	29.72	217.55	30.89	153.05	27.29	61.67	8.86	47.39	6.92
AVL-L	20	YKN08000134	795750	23.06	177.85	24.33	124.08	21.24	50.74	6.8	38.47	5.27
AVL-L	21	YKN08000134	795825	24.54	176.26	25.28	129.57	22.18	53	7.16	39.4	5.5
AVL-L	22	YKN08000119	793850	23.67	181.4	25.54	128.18	22.36	50.7	7.02	39.23	5.62
AVL-L	23	YKN08000111	793650	23.92	182.89	26.12	130.08	22.54	52.37	7.25	39.97	5.66
AVL-L	24	YKN08000119	793800	25.01	190.74	27.34	139.49	23.71	55.28	7.55	41.91	6.08
AVL-L	25	YKN08000119	793825	23.71	178.5	25.74	127.64	22.6	51.7	7.2	39.39	5.6
AVL-L	26	YKN08000111	793600	26.6	195.37	27.66	141.08	24.92	56.15	7.77	42.84	6.18
AVL-L	27	YKN08000111	793675	24.32	181.67	25.38	131.39	23.01	50.47	7.18	40.24	5.73
AVL-L	28	YKN08000130	795150	24.21	176.43	25.37	127.11	22.64	52.04	7.12	39.05	5.6
AVL-L	29	YKN08000130	795050	25.43	189.32	27.66	139.07	24.48	55.45	7.56	42.62	6.02
AVL-L	30	YKN08000130	795075	26.78	189.56	27.84	138.04	24.48	57.14	7.74	42.37	6.05
AVL-L	31	YKN08000137	796050	23.93	182.6	24.4	124.24	21.48	51.09	6.98	39.15	5.43
AVL-L	32	YKN08000137	796100	24.55	192.93	25.53	131.49	22.06	52.45	7.11	40.98	5.52
AVL-L	33	YKN08000137	795950	23.38	172.61	25.15	127.96	22.41	51.71	6.96	38.32	5.57
AVL-L	34	YKN08000140	796375	24.75	171.54	26.49	130.23	23.4	53.73	7.28	39.71	5.75
AVL-L	35	YKN08000155	796550	24	196.35	25.12	129.27	21.92	51.98	6.93	40.1	5.42
AVL-L	36	YKN08000155	796650	21.29	159.47	22.94	113.81	19.96	45.16	6.44	35.55	5.04
AVL-L	37	YKN08000129	794925	25.63	196.18	27.36	135.9	24.34	55.42	7.61	42.2	5.97
AVL-L	38	YKN08000129	794950	25.41	192.66	27.05	136.03	24.06	54.3	7.64	42.04	5.96
AVL-L	39	YKN08000162	797000	23.01	176.18	24.39	124.23	21.57	49.38	6.84	38.58	5.45
AVL-L	40	YKN08000162	712050	22.26	171.59	24.39	123.59	21.61	48.13	6.68	36.16	5.47
AVL-L	41	YKN08000162	796925	22.92	169.41	23.87	120.41	21.01	48.41	6.74	37.28	5.33
AVL-L	42	YKN08000138	796178	23.38	185.21	24.71	129.03	21.53	51.01	6.87	38.78	5.25
AVL-L	43	YKN08000138	796125	21.59	172.99	22.89	119.09	20.12	46.84	6.35	36.82	4.97
AVL-L	44	YKN08000138	796225	22.41	165.56	23.54	120.4	20.34	48.16	6.58	37.34	5.11
AVL-L	45	YKN08000163	712125	23.9	177.32	26.04	131.1	23.07	52.49	7.08	39.45	5.77
AVL-L	46	YKN08000158	796825	22.89	172.53	23.29	120.44	20.72	49.62	6.49	37.57	5.03
AVL-L	47	YKN08000158	796725	25.05	212.28	26.53	136.12	23.03	53.7	7.23	41.85	5.78
AVL-L	48	YKN08000167	712275	23.89	207.74	24.7	135.27	21.52	51.19	7.11	43.27	5.45
AVL-L	49	YKN08000176	712600	25.64	190.18	27.14	134.34	23.41	55.83	7.42	40.84	5.81
AVL-L	50	YKN08000133	795550	25.72	190.48	26.54	133.26	23.2	54.06	7.24	40.44	5.72
AVL-L	51	YKN08000133	795600	24.1	178.56	25.7	125.72	21.96	51.94	7.19	38.69	5.55
AVL-L	52	YKN08000133	795650	24.81	185.71	25.87	133.85	23.34	52.11	7.2	40.61	5.7
AVL-L	53	YKN08000133	795525	24.58	180.63	25.07	126.05	21.88	50.84	6.84	37.86	5.39
AVL-L	54	YKN08000133	795625	23.73	181.63	24.97	130.72	22	51.61	6.92	40.05	5.49
AVL-L	55	YKN08000168	712375	23.7	191.33	24.89	126.6	21.23	50.52	6.84	40.06	5.4
AVL-L	56	YKN08000168	712525	24.79	210.34	25.49	134.39	22.63	53.59	7.22	41.78	5.6
AVL-L	57	YKN08000168	712450	22.83	186.77	23.85	122.63	21.04	48.88	6.6	38.27	5.2
				Eu	**Gd**	**Tb**	**Dy**	**Ho**	**Er**	**Tm**	**Yb**	**Lu**
Min				21.29	146.3	22.89	113.81	19.96	45.16	6.35	35.55	4.97
Mean				**24.46**	**182.82**	**25.82**	**130.94**	**22.76**	**52.65**	**7.20**	**40.25**	**5.66**
Max				29.72	217.55	30.89	153.05	27.29	61.67	8.86	47.39	6.92
				57	57	57	57	57	57	57	57	57

STD_cor	Lot #	WO	Samp_id	Ga	Hf	Nb	Ta	Th	Zr	Hole_id
AVL-L	1	YKN07000040	684530	99.9	238.4	1687	137.9	71.5	10991	L07-061A
AVL-L	2	YKN07000040	717000	102.4	236	1303	128.8	72.2	10126	L07-061A
AVL-L	3	YKN07000042	684650	93.8	229.6	1397	124.1	68.3	8173	L07-063
AVL-L	4	YKN07000036	716790	98.8	229.5	1507	131.3	68.3	8466	L07-058
AVL-L	5	YKN07000039	716880	99	239.7	1286	138.8	74.9	8549	L07-059
AVL-L	6	YKN07000039	716910	93.6	206.3	1122	117	69	7703	L07-060
AVL-L	7	YKN08000108	793225	97.7	224.3	1477.9	120.8	68.4	10175.8	L08-068
AVL-L	8	YKN08000108	793175	99.5	246.3	1556.9	128.9	68.4	10804.1	L08-067
AVL-L	9	YKN08000117	793390	93.1	245.8	1574.7	131.1	73.7	10594.8	L08-070
AVL-L	10	YKN08000117	793275	97.9	238.7	1568.3	132	72.5	10441.8	L08-069
AVL-L	11	YKN08000115	793475	98.2	243.4	1629.6	132.9	75.2	10640.6	L08-071
AVL-L	12	YKN08000122	793926	94.6	220.1	1437.4	120.9	70.9	9182.9	L08-075A
AVL-L	13	YKN08000122	794000	94.4	222.7	1454.9	122.6	71.4	9477.5	L08-076
AVL-L	14	YKN08000122	794600	100	229	1499.7	126.5	73	10046.5	L08-077
AVL-L	15	YKN08000125	794675	96.6	233.1	1496	124.5	71.6	9857.7	L08-077
AVL-L	16	YKN08000125	794825	94.7	218.7	1390.4	112.9	69.4	8989.7	L08-079
AVL-L	17	YKN08000125	794700	94.6	214.8	1411.7	114.6	73	9174.4	L08-078
AVL-L	18	YKN08000132	795375	98.6	238.8	1556.8	127.1	75.5	10016	L08-085
AVL-L	19	YKN08000132	795225	101	248.5	1610.8	131.8	83.8	10502	L08-084
AVL-L	20	YKN08000134	795750	90.3	225.9	1383.4	126.7	65.1	9091.5	L08-089
AVL-L	21	YKN08000134	795825	95.9	227.5	1500.6	130.8	69	9455.5	L08-089
AVL-L	22	YKN08000119	793850	95.1	218.9	1413	119.3	70.7	9098.9	L08-074
AVL-L	23	YKN08000111	793650	96	217.8	1439.5	120.5	69.2	9269.6	L08-072
AVL-L	24	YKN08000119	793800	96	224.7	1408.1	122.2	72.3	8988.3	L08-074
AVL-L	25	YKN08000119	793825	94.7	213.8	1377	116.9	71.3	8802.6	L08-074
AVL-L	26	YKN08000111	793600	96.4	238.3	1547.1	125.6	73.8	9912.8	L08-072
AVL-L	27	YKN08000111	793675	99.6	227.1	1487.3	124.4	74	9722.3	L08-073
AVL-L	28	YKN08000130	795150	97.4	221.4	1392.1	121.3	72.5	9039	L08-083
AVL-L	29	YKN08000130	795050	100.1	230.7	1516.8	126.9	72.8	9798.3	L08-082
AVL-L	30	YKN08000130	795075	96.6	237	1490.7	138.8	72.7	9551	L08-082
AVL-L	31	YKN08000137	796050	95.7	228.5	1477.3	128.1	66.9	10246	L08-091
AVL-L	32	YKN08000137	796100	99.8	231.2	1498.9	131	68.4	10530.3	L08-092
AVL-L	33	YKN08000137	795950	97.7	229.8	1489.8	123.2	70.5	9984.7	L08-091
AVL-L	34	YKN08000140	796375	95.5	227.8	1469.9	134.1	69.6	9537.9	L08-096
AVL-L	35	YKN08000155	796550	96.6	229.9	1540.9	131.5	68.9	10276.3	L08-097
AVL-L	36	YKN08000155	796650	91.9	207	1325.8	123.8	64.8	8806.3	L08-098
AVL-L	37	YKN08000129	794925	92.4	226	1427.6	123.2	71.6	9222	L08-080
AVL-L	38	YKN08000129	794950	94.8	220.4	1431.9	121.5	69.8	9225.7	L08-081
AVL-L	39	YKN08000162	797000	96	233	1414.1	134.8	65.6	9797.4	L08-102
AVL-L	40	YKN08000162	712050	89.6	208.1	1274.9	121.9	68.4	8229.6	L08-102
AVL-L	41	YKN08000162	796925	89.7	223.3	1328.7	129.1	64.1	9334.7	L08-101
AVL-L	42	YKN08000138	796178	94.8	227.7	1461.4	128	66.7	10138.7	L08-092
AVL-L	43	YKN08000138	796125	89	211.9	1330.6	120.8	62.7	9318.9	L08-092
AVL-L	44	YKN08000138	796225	92.8	222.6	1450.6	128.3	69.7	9831.3	L08-093
AVL-L	45	YKN08000163	712125	95.9	224.7	1379.7	127.8	74.1	9086.9	L08-103
AVL-L	46	YKN08000158	796825	93.1	213.6	1347	122.6	63.5	8992.9	L08-099
AVL-L	47	YKN08000158	796725	100.4	240.6	1477.2	132.9	73.4	10391.4	L08-099
AVL-L	48	YKN08000167	712275	96.5	248.9	1174.4	120.2	64.2	11305.6	L08-104
AVL-L	49	YKN08000176	712600	95.9	243.1	1543.8	139.8	69.8	10119.3	L08-108
AVL-L	50	YKN08000133	795550	100	230.3	1526.9	137.6	72.2	9726.9	L08-087
AVL-L	51	YKN08000133	795600	94.3	220.2	1389	124.5	71.2	9128.7	L08-087
AVL-L	52	YKN08000133	795650	93.9	220.3	1481.9	129.8	68.7	9776.9	L08-088
AVL-L	53	YKN08000133	795525	92.5	214.4	1422.2	128.4	65.5	9044	L08-087
AVL-L	54	YKN08000133	795625	89.8	229.1	1313.6	132.4	69.8	8548.1	L08-088
AVL-L	55	YKN08000168	712375	101.1	237.9	1650	138.8	66.3	10819.5	L08-106
AVL-L	56	YKN08000168	712525	103.9	229.8	1477.4	128.7	61.5	10861.9	L08-107
AVL-L	57	YKN08000168	712450	95.4	224.8	1572.8	133.4	64.5	10644.5	L08-106

	Ga	Hf	Nb	Ta	Th	Zr
Min	89	206.3	1122	112.9	61.5	7703
Mean	**96.06**	**227.9**	**1449.1**	**127.26**	**69.94**	**9641.54**
Max	103.9	248.9	1687	139.8	83.8	11305.6
	57	57	57	57	57	57

APPENDIX D

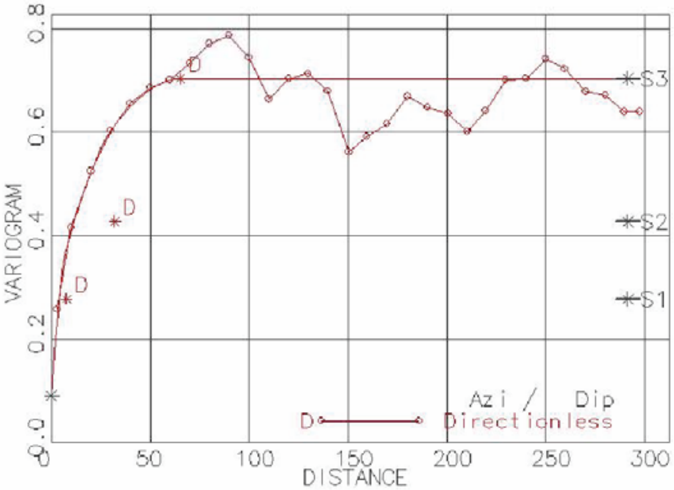
BASAL ZONE INTERSECTIONS

Hole ID	From	To	Comments
78-11			hole too shallow
78-12			hole too shallow
79-01			hole too shallow
79-02			hole too shallow
79-03			hole too shallow
79-04			hole too shallow
79-05			hole too shallow
80-01			hole too shallow
80-02			hole too shallow
80-03			hole too shallow
80-04			hole too shallow
80-05	76.20	85.34	
80-06*			hole too shallow
80-07	115.21	124.36	
80-08	118.26	138.07	
80-09*	70.00	106.68	
80-10			no basal zone
80-11			no basal zone
80-12	133.50	153.31	hole ends in basal zone
80-13			hole too shallow
81-01*	66.40	71.60	
81-02			hole too shallow
81-03	71.90	76.80	
81-04	62.80	74.80	
81-05	28.80	44.00	
84L-01*			hole too shallow
84L-02			hole too shallow
84L-03			hole too shallow
84L-04			hole too shallow
84L-05			hole too shallow
85L-06			no basal zone
86L-07			hole too shallow
88L-08	92.05	104.24	
88L-09	133.20	151.49	hole ends in basal zone
88L-10	92.81	102.72	
88L-11	114.91	127.10	
88L-12			hole too shallow
88L-13			hole too shallow
88L-14			hole too shallow
88L-15			hole too shallow
88L-16			hole too shallow
88L-17			hole too shallow
88L-18			hole too shallow
88L-19			hole too shallow
88L-20			hole too shallow
88L-21			hole too shallow
88L-22			hole too shallow
88L-23	107.59	122.53	
88L-24	123.44	129.54	
88L-25*	133.20	142.10	
88L-26*	137.80	146.90	
L07-052	128.00	150.00	
L07-053	131.00	155.92	
L07-054	141.00	155.00	
L07-055	118.00	144.00	
L07-056			abandoned
L07-056A	162.00	178.10	
L07-057			abandoned
L07-057A	151.00	173.00	
L07-058	108.00	117.40	
L07-059	98.00	120.00	
L07-060	73.00	109.00	
L07-061			abandoned
L07-061A	152.90	174.65	
L07-062			no basal zone
L07-063	148.00	177.00	
L07-064	149.00	165.00	
L08-065			no basal zone
L08-066	120.55	141.00	
L08-067			diabase
L08-068	129.00	152.80	
L08-069	125.50	141.70	
L08-070	92.00	110.90	
L08-071	87.00	100.60	
L08-072	125.00	144.40	
L08-073	98.00	117.45	
L08-074	84.00	108.00	
L08-075			abandoned in diabase
L08-075A	86.00	100.00	
L08-076	106.00	120.00	
L08-077	99.00	114.35	
L08-078	109.70	124.85	
L08-079	125.00	153.50	
L08-080	89.40	113.00	
L08-081	93.00	107.00	
L08-082	98.35	140.15	
L08-083	127.60	162.00	
L08-084			diabase
L08-085	138.00	156.00	
L08-086		123.70	no basal zone, used base of altered syenite
L08-087	107.00	132.00	
L08-088	147.00	163.80	

Hole ID	From	To	Comments
L08-089	172.00	194.00	
L08-090	116.65	130.00	
L08-091	103.90	130.00	
L08-092		199.80	top in diabase
L08-093			too shallow
L08-094	134.00	155.25	
L08-095	68.00	84.70	
L08-096	91.15	104.00	
L08-097	125.00	145.00	
L08-098	131.00	161.00	
L08-099	85.00	121.00	
L08-100	101.00	127.00	
L08-101	125.00	154.30	
L08-102	95.00	109.00	
L08-103	105.50	117.00	
L08-104	106.00	133.60	
L08-105	150.00	170.00	
L08-106	103.40	132.00	
L08-107	125.80	141.80	
L08-108	102.00	132.60	
L08-109	101.50	129.00	
L08-110	85.25	97.00	
L08-111	103.00	116.90	
L08-112			no basal zone
L08-113	80.50	123.90	
L08-114	116.35	147.70	
L08-115	71.00	112.00	
L08-116	118.15	147.00	
L08-117	97.50	142.60	
L08-118	163.85	195.00	
L08-119			no basal zone
L08-120			no basal zone
L08-121			diabase
L08-122			diabase
L08-122A			diabase
L08-123			no basal zone
L08-124			no basal zone
L08-125	89.00	113.00	
L08-126	86.00	128.00	
L08-127	61.00	93.00	
L08-128			no basal zone
L08-129	151.00	196.10	
L08-130			no basal zone
L08-131	201.20	219.60	
L08-132	220.00	245.40	
L08-133			hole too short
L08-134	157.65	178.00	
L08-135			diabase
L08-136			no basal zone

APPENDIX E

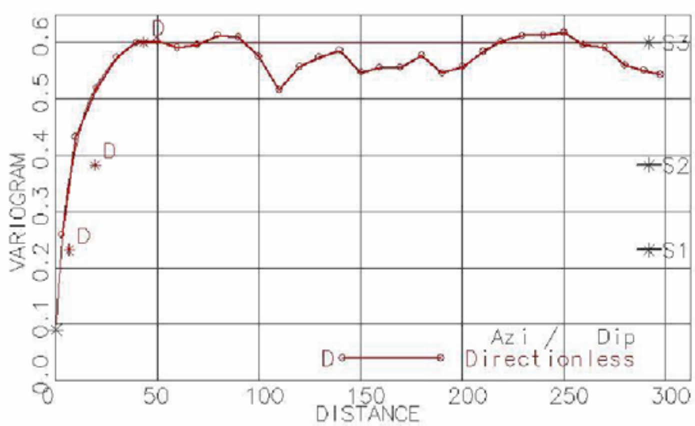
SEMI-VARIOGRAMS



Variogram Grade: Y203

3 Structure Isotropic Model. Nugget - 0.091

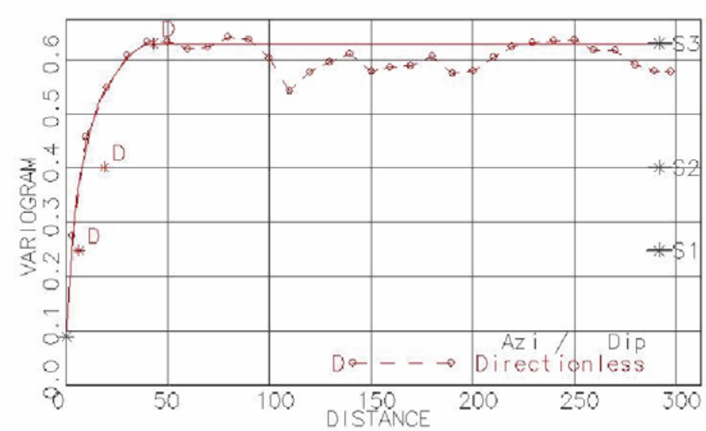
Structure	Range	C Value	Sill
1	7.5	0.187	0.278
2	31.9	0.149	0.427
3	65.2	0.276	0.703



Variogram Grade: La203

3 Structure Isotropic Model. Nugget - 0.089

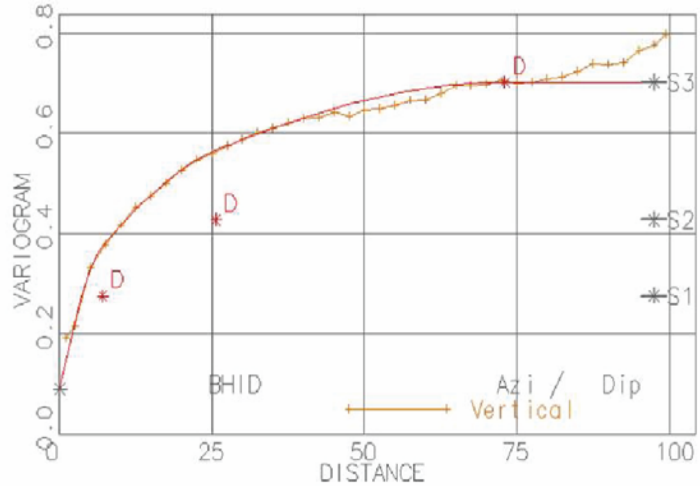
Structure	Range	C Value	Sill
1	6.5	0.142	0.231
2	19.2	0.151	0.382
3	43.2	0.217	0.599



Variogram Grade: Ce203

3 Structure Isotropic Model. Nugget - 0.089

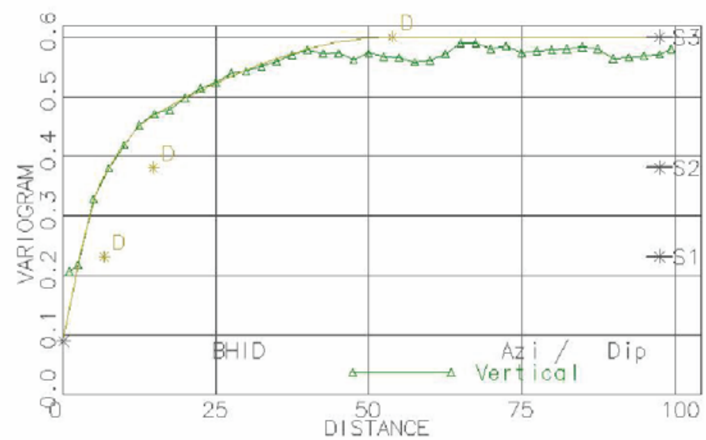
Structure	Range	C Value	Sill
1	6.3	0.159	0.248
2	18.7	0.153	0.401
3	43.0	0.229	0.630



Variogram Grade: Y203 BHID :

3 Structure Isotropic Model. Nugget - 0.090

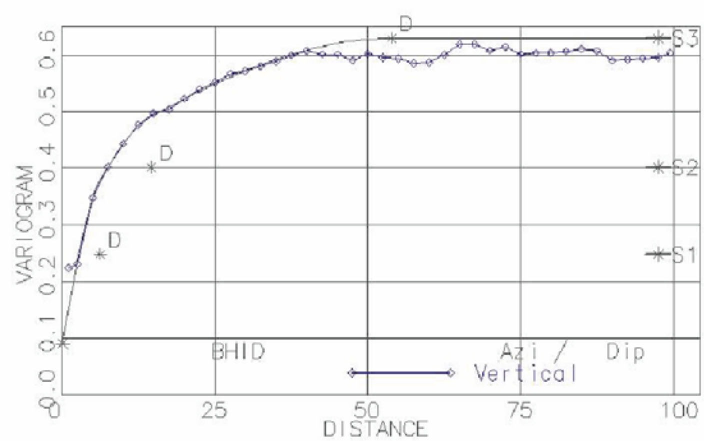
Structure	Range	C Value	Sill
1	7.0	0.186	0.276
2	25.6	0.151	0.427
3	73.0	0.274	0.701



Variogram Grade: La203 BHID :

3 Structure Isotropic Model. Nugget - 0.090

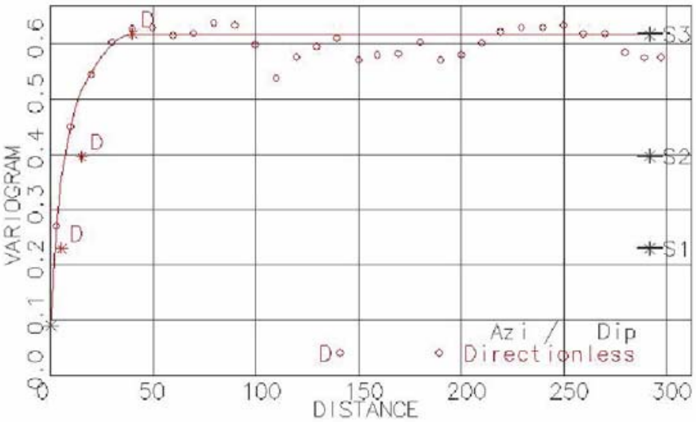
Structure	Range	C Value	Sill
1	6.7	0.141	0.231
2	14.7	0.149	0.381
3	53.8	0.219	0.599



Variogram Grade: Ce203 BHID :

3 Structure Isotropic Model. Nugget - 0.090

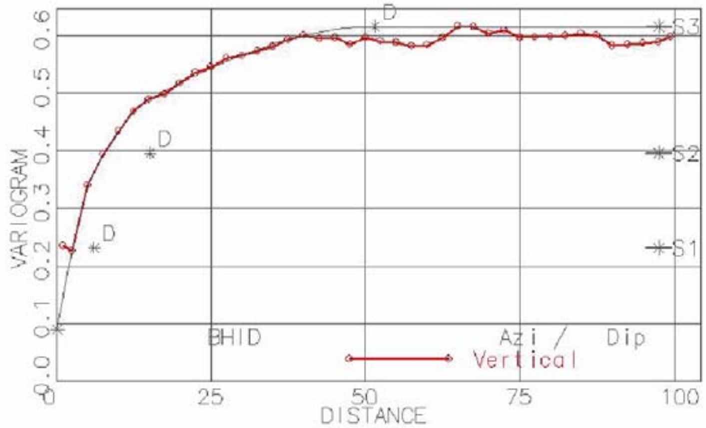
Structure	Range	C Value	Sill
1	6.2	0.158	0.248
2	14.6	0.154	0.401
3	53.8	0.228	0.630



Variogram Grade: Pr2O3

3 Structure Isotropic Model. Nugget – 0.090

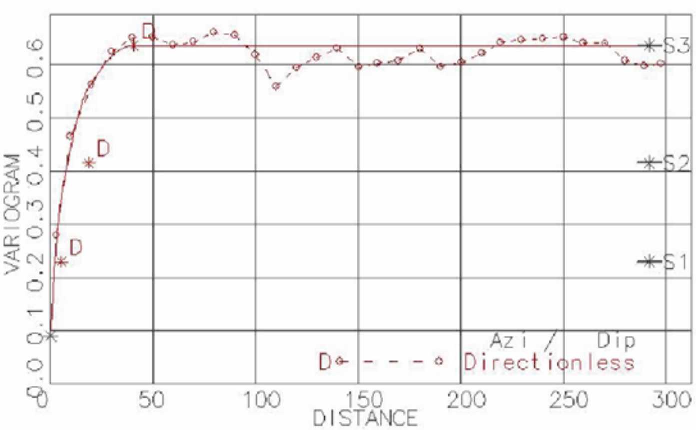
Structure	Range	C Value	Sill
1	5.4	0.140	0.230
2	15.2	0.166	0.396
3	39.9	0.221	0.617



Variogram Grade: Pr2O3 BHID :

3 Structure Isotropic Model. Nugget – 0.090

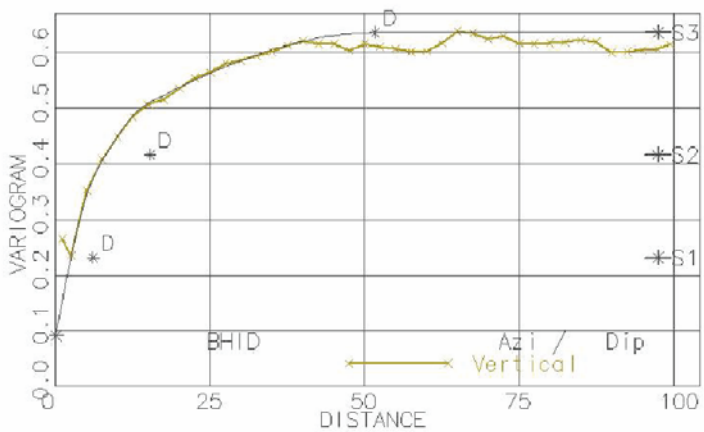
Structure	Range	C Value	Sill
1	6.0	0.141	0.231
2	15.1	0.165	0.396
3	51.5	0.220	0.616



Variogram Grade: Nd2O3

3 Structure Isotropic Model. Nugget – 0.090

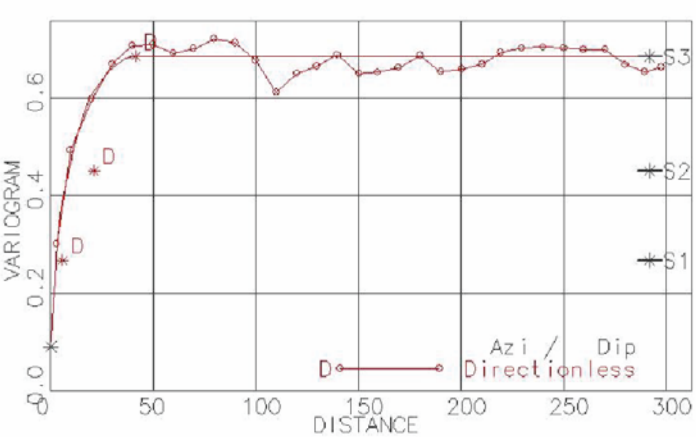
Structure	Range	C Value	Sill
1	5.4	0.140	0.230
2	18.7	0.185	0.415
3	40.7	0.220	0.635



Variogram Grade: Nd2O3 BHID :

3 Structure Isotropic Model. Nugget – 0.090

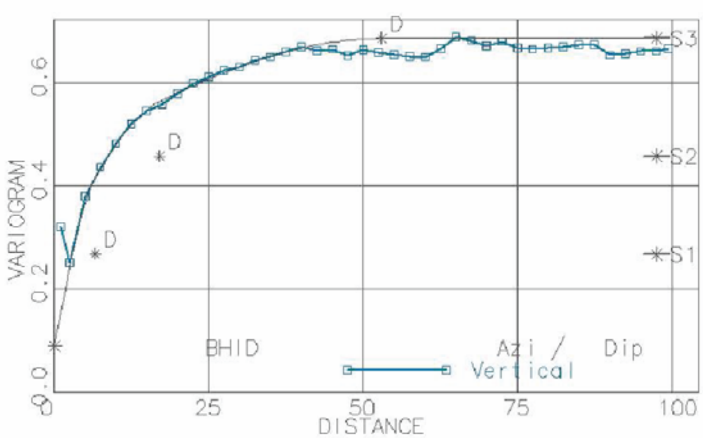
Structure	Range	C Value	Sill
1	6.0	0.141	0.231
2	15.2	0.185	0.416
3	51.6	0.220	0.636



Variogram Grade: Sm2O3

3 Structure Isotropic Model. Nugget – 0.090

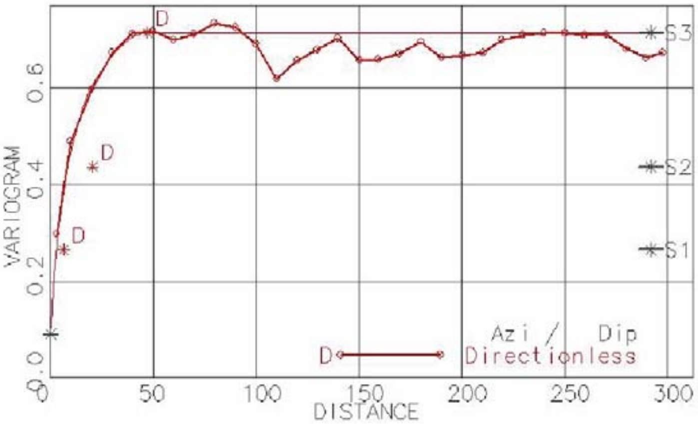
Structure	Range	C Value	Sill
1	5.8	0.177	0.267
2	21.1	0.183	0.450
3	41.4	0.235	0.685



Variogram Grade: Sm2O3 BHID :

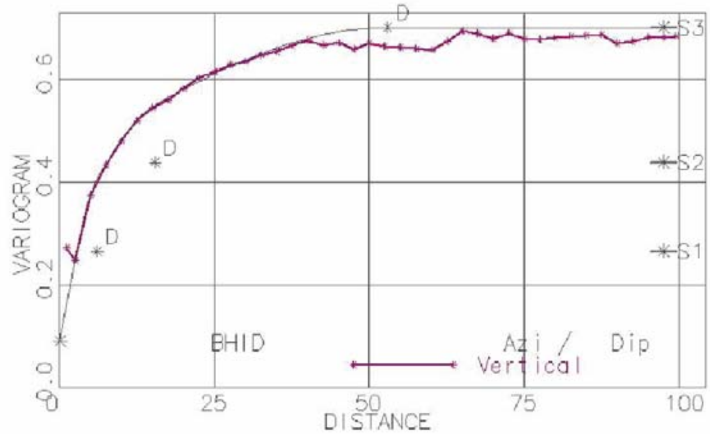
3 Structure Isotropic Model. Nugget – 0.090

Structure	Range	C Value	Sill
1	6.6	0.177	0.267
2	17.0	0.189	0.457
3	53.0	0.229	0.685



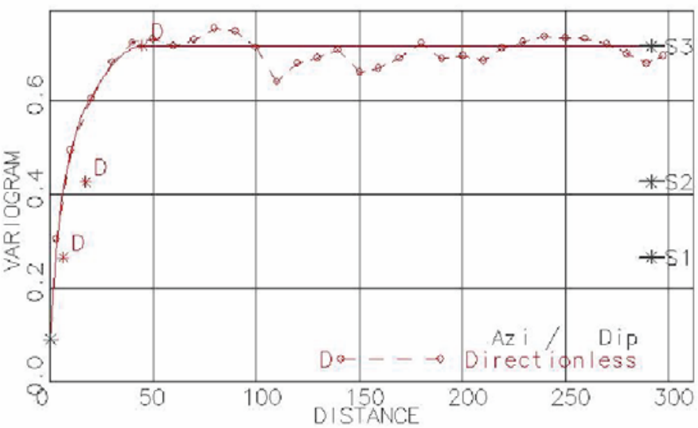
Variogram Grade: Eu_2O_3

3 Structure Structure	Isotropic Model. Range	C Value	Nugget - Sill	0.090
1	6.4	0.175	0.265	
2	20.4	0.172	0.437	
3	47.1	0.278	0.715	



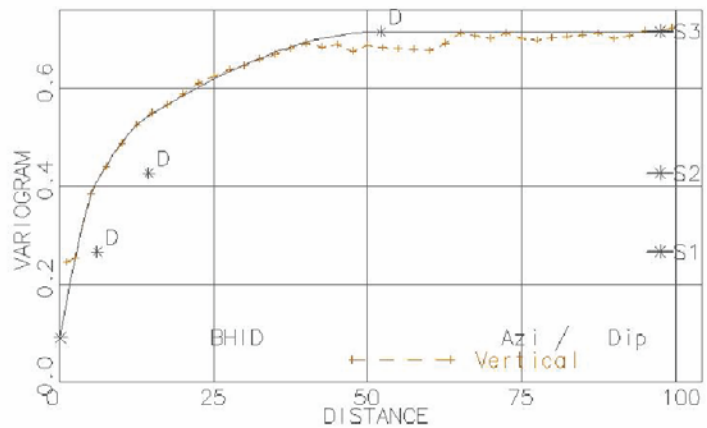
Variogram Grade: Eu_2O_3 BHID :

3 Structure Structure	Isotropic Model. Range	C Value	Nugget - Sill	0.090
1	6.0	0.175	0.265	
2	15.4	0.173	0.438	
3	52.9	0.262	0.700	



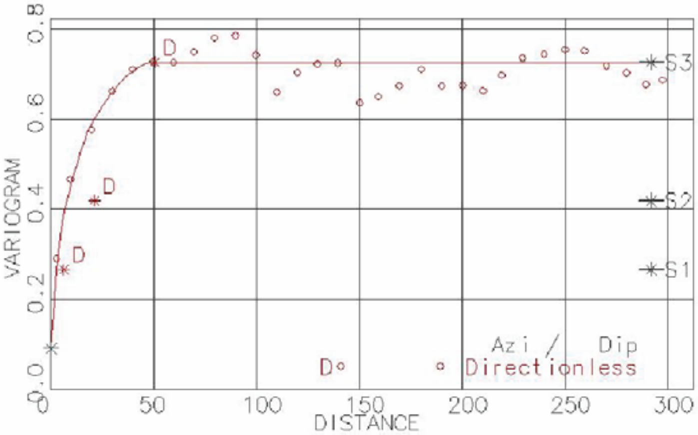
Variogram Grade: Gd_2O_3

3 Structure Structure	Isotropic Model. Range	C Value	Nugget - Sill	0.090
1	6.3	0.175	0.265	
2	17.1	0.161	0.426	
3	44.6	0.290	0.716	



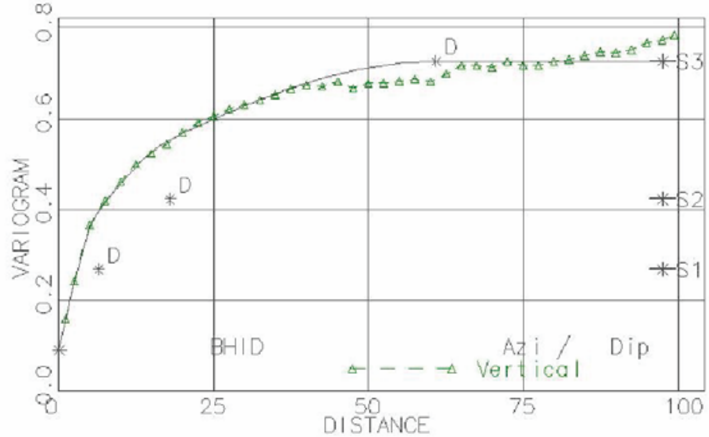
Variogram Grade: Gd_2O_3 BHID :

3 Structure Structure	Isotropic Model. Range	C Value	Nugget - Sill	0.090
1	6.0	0.176	0.266	
2	14.4	0.160	0.426	
3	52.1	0.289	0.716	



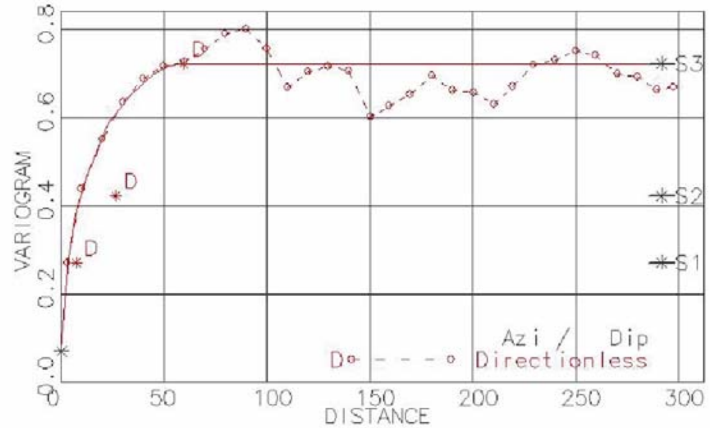
Variogram Grade: Tb_2O_3

3 Structure Structure	Isotropic Model. Range	C Value	Nugget - Sill	0.090
1	6.3	0.175	0.265	
2	21.1	0.153	0.418	
3	50.5	0.308	0.725	



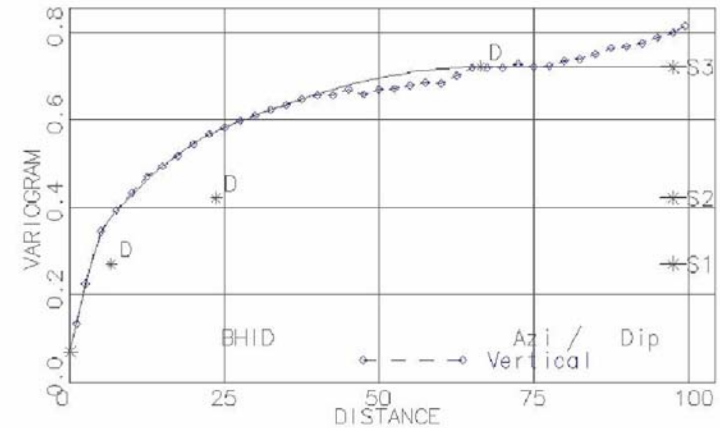
Variogram Grade: Tb_2O_3 BHID :

3 Structure Structure	Isotropic Model. Range	C Value	Nugget - Sill	0.090
1	6.4	0.177	0.267	
2	18.0	0.155	0.422	
3	60.9	0.304	0.726	



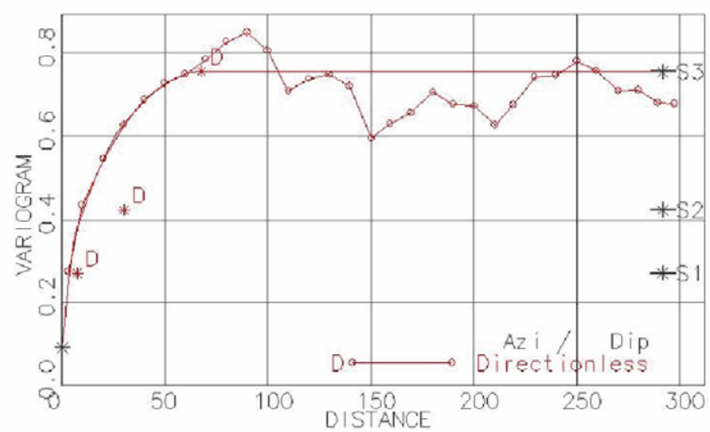
Variogram Grade: Dy203

3 Structure Isotropic Model. Structure	Range	C Value	Nugget – Sill	0.070
1	7.3	0.200	0.271	
2	26.5	0.152	0.422	
3	59.5	0.300	0.722	



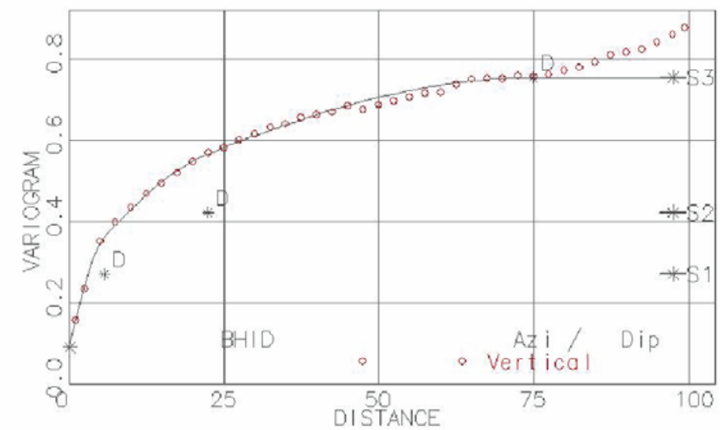
Variogram Grade: Dy203 BHID :

3 Structure Isotropic Model. Structure	Range	C Value	Nugget – Sill	0.070
1	6.6	0.200	0.270	
2	23.6	0.151	0.421	
3	66.3	0.300	0.721	



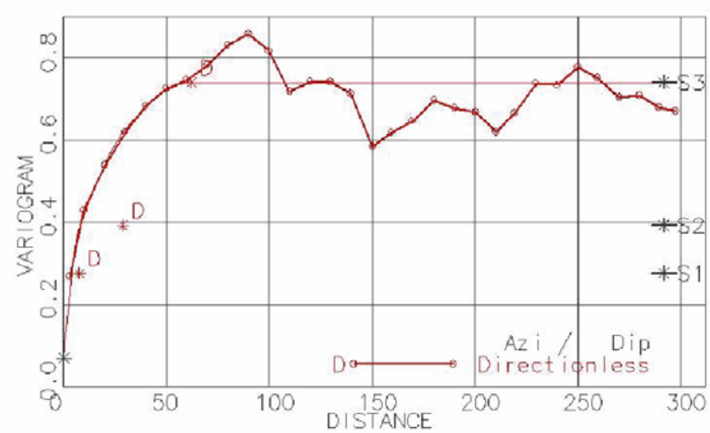
Variogram Grade: Ho203

3 Structure Isotropic Model. Structure	Range	C Value	Nugget – Sill	0.091
1	7.3	0.180	0.271	
2	30.1	0.152	0.422	
3	67.7	0.333	0.755	



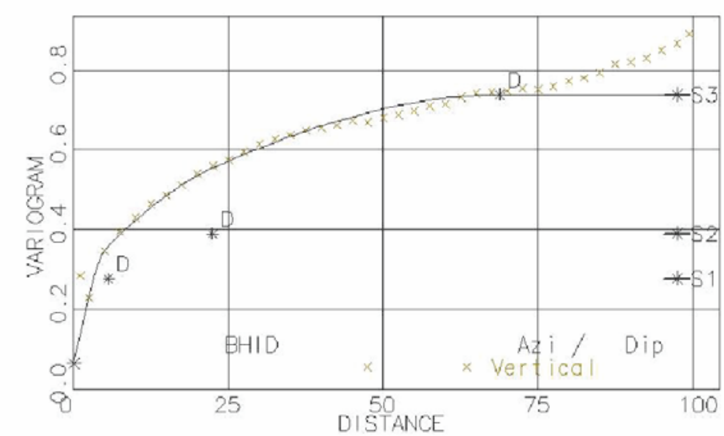
Variogram Grade: Ho203 BHID :

3 Structure Isotropic Model. Structure	Range	C Value	Nugget – Sill	0.090
1	5.6	0.181	0.271	
2	22.3	0.152	0.423	
3	74.8	0.332	0.755	



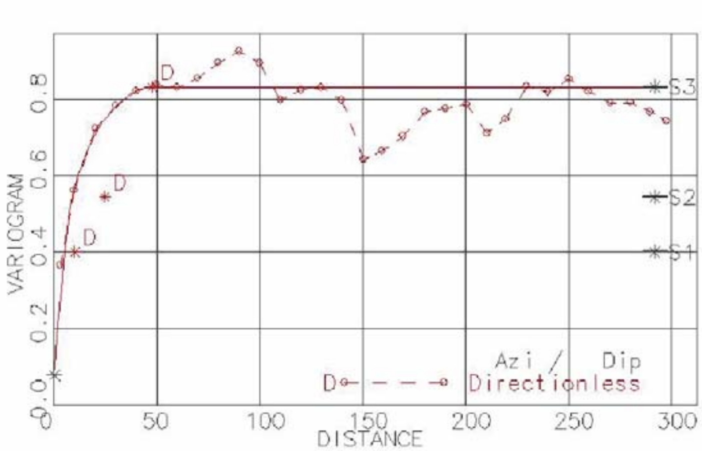
Variogram Grade: Er203

3 Structure Isotropic Model. Structure	Range	C Value	Nugget – Sill	0.069
1	7.7	0.206	0.275	
2	28.9	0.117	0.392	
3	62.2	0.348	0.740	



Variogram Grade: Er203 BHID :

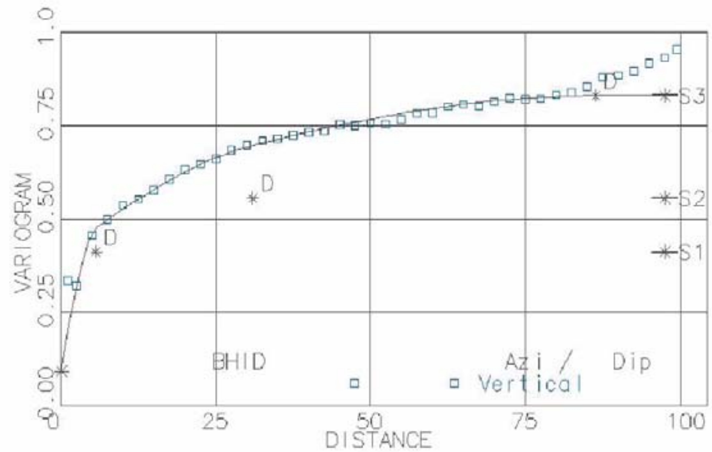
3 Structure Isotropic Model. Structure	Range	C Value	Nugget – Sill	0.065
1	5.6	0.211	0.276	
2	22.4	0.112	0.389	
3	68.8	0.350	0.739	



Variogram Grade: Tm203

3 Structure Isotropic Model. Nugget - 0.079

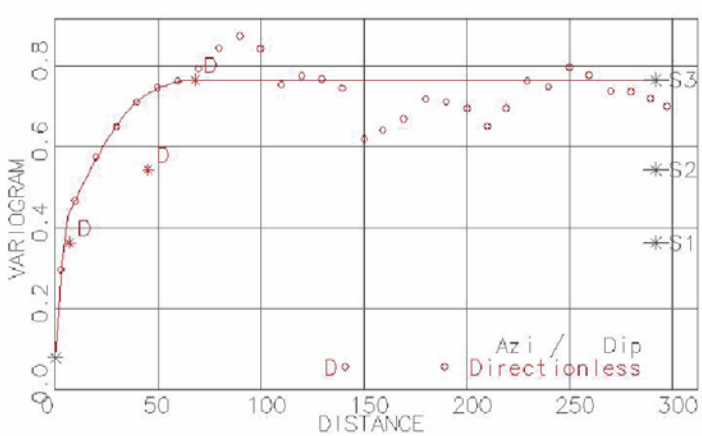
Structure	Range	C Value	Sill
1	10.1	0.321	0.400
2	24.6	0.144	0.544
3	47.7	0.287	0.831



Variogram Grade: Tm203 BHID :

3 Structure Isotropic Model. Nugget - 0.092

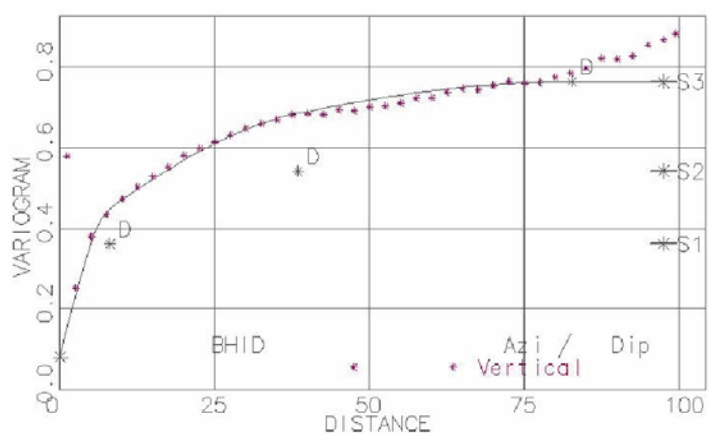
Structure	Range	C Value	Sill
1	5.6	0.320	0.412
2	30.9	0.144	0.556
3	86.3	0.275	0.831



Variogram Grade: Yb203

3 Structure Isotropic Model. Nugget - 0.079

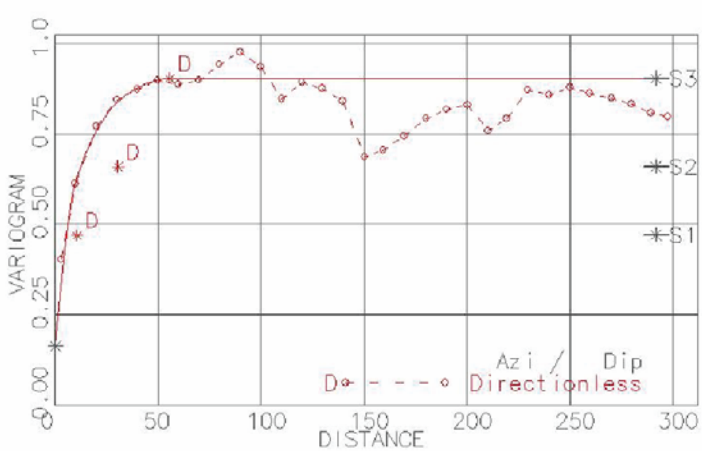
Structure	Range	C Value	Sill
1	6.9	0.284	0.363
2	45.0	0.181	0.544
3	68.1	0.222	0.766



Variogram Grade: Yb203 BHID :

3 Structure Isotropic Model. Nugget - 0.081

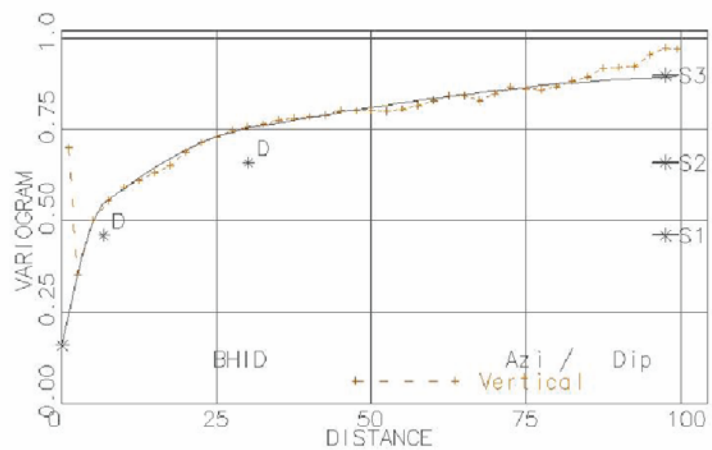
Structure	Range	C Value	Sill
1	8.0	0.281	0.362
2	38.4	0.180	0.542
3	82.7	0.222	0.764



Variogram Grade: Lu203

3 Structure Isotropic Model. Nugget - 0.164

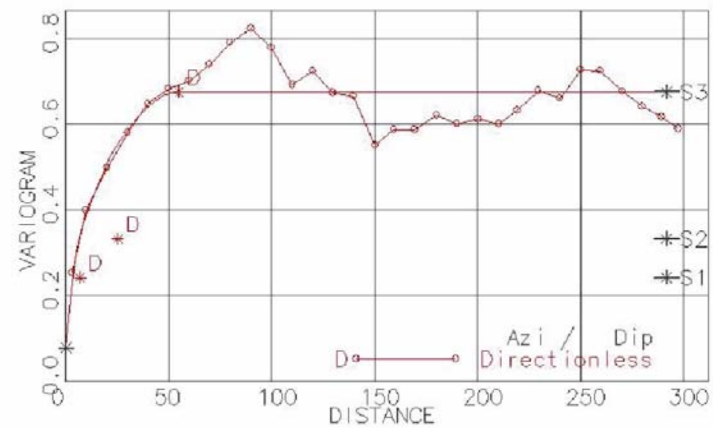
Structure	Range	C Value	Sill
1	10.5	0.306	0.469
2	30.5	0.189	0.659
3	55.6	0.244	0.903



Variogram Grade: Lu203 BHID :

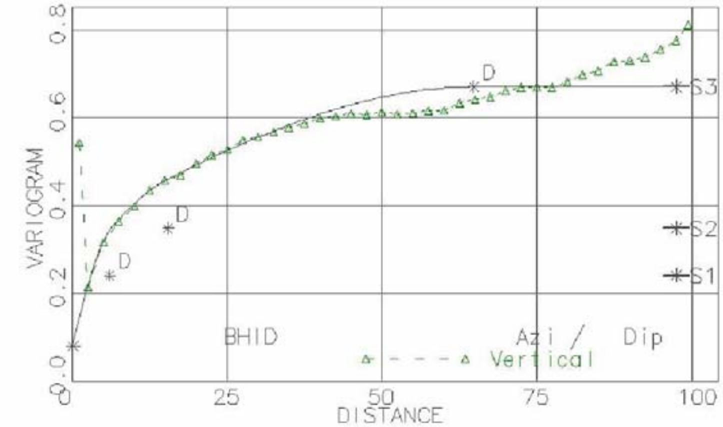
3 Structure Isotropic Model. Nugget - 0.158

Structure	Range	C Value	Sill
1	6.7	0.301	0.459
2	30.1	0.198	0.658
3	110.0	0.240	0.898



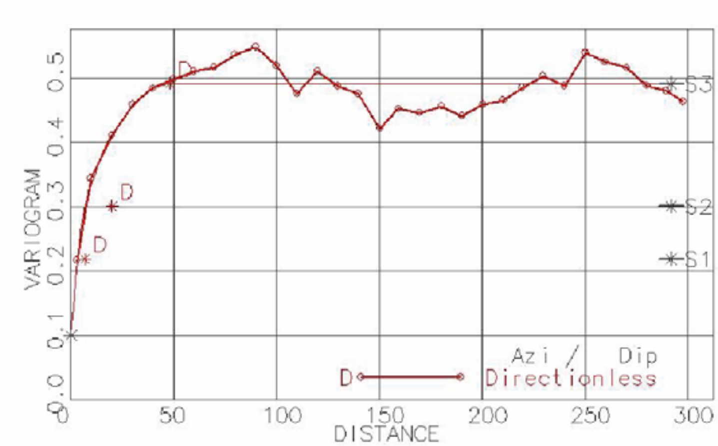
Variogram Grade: Ta205

3 Structure Isotropic Model.			Nugget –	0.078
Structure	Range	C Value	Sill	
1	6.9	0.164	0.242	
2	25.2	0.090	0.333	
3	54.9	0.343	0.675	



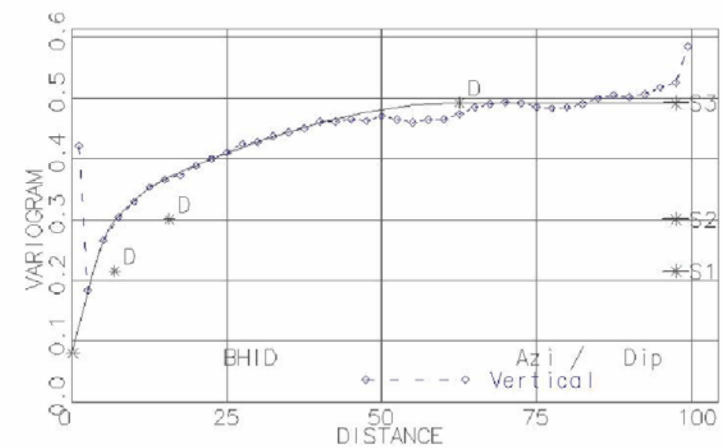
Variogram Grade: Ta205 BHID :

3 Structure Isotropic Model.			Nugget –	0.080
Structure	Range	C Value	Sill	
1	6.0	0.160	0.240	
2	15.4	0.107	0.348	
3	64.8	0.322	0.670	



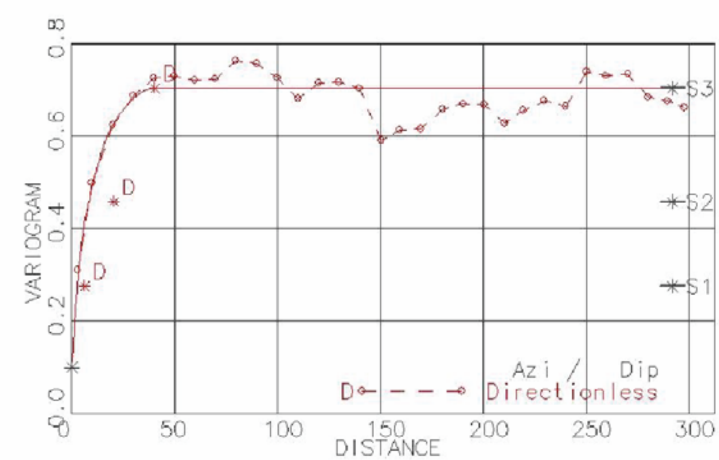
Variogram Grade: Nb205

3 Structure Isotropic Model.			Nugget –	0.100
Structure	Range	C Value	Sill	
1	6.9	0.118	0.218	
2	20.1	0.082	0.300	
3	48.2	0.190	0.490	



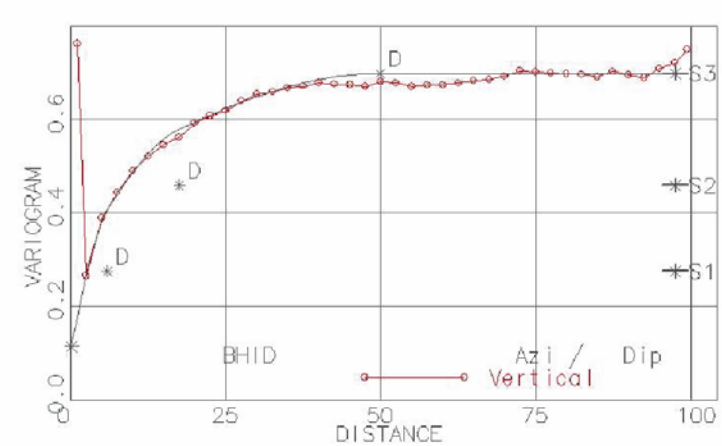
Variogram Grade: Nb205 BHID :

3 Structure Isotropic Model.			Nugget –	0.080
Structure	Range	C Value	Sill	
1	6.8	0.135	0.215	
2	15.6	0.085	0.300	
3	62.5	0.191	0.491	



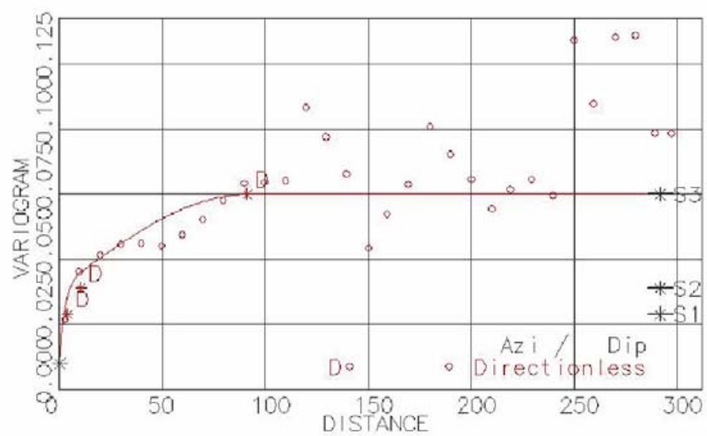
Variogram Grade: ZrO2

3 Structure Isotropic Model.			Nugget –	0.100
Structure	Range	C Value	Sill	
1	6.3	0.176	0.276	
2	20.4	0.182	0.458	
3	40.4	0.246	0.704	



Variogram Grade: ZrO2 BHID :

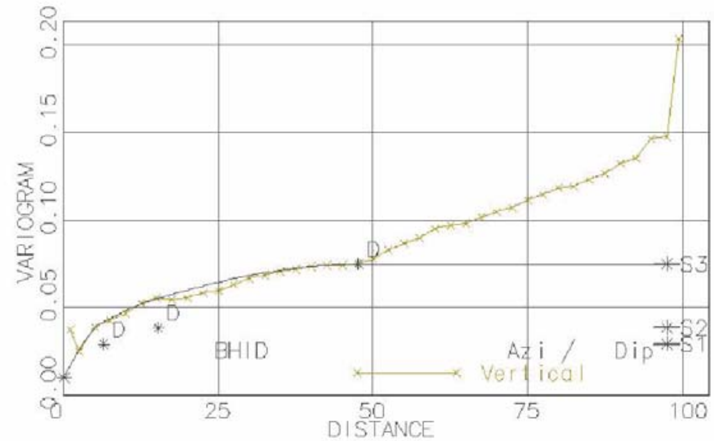
3 Structure Isotropic Model.			Nugget –	0.113
Structure	Range	C Value	Sill	
1	5.8	0.161	0.274	
2	17.5	0.184	0.458	
3	49.9	0.239	0.697	



Variogram Grade: Ga2O3

3 Structure Isotropic Model. Nugget = 0.0100

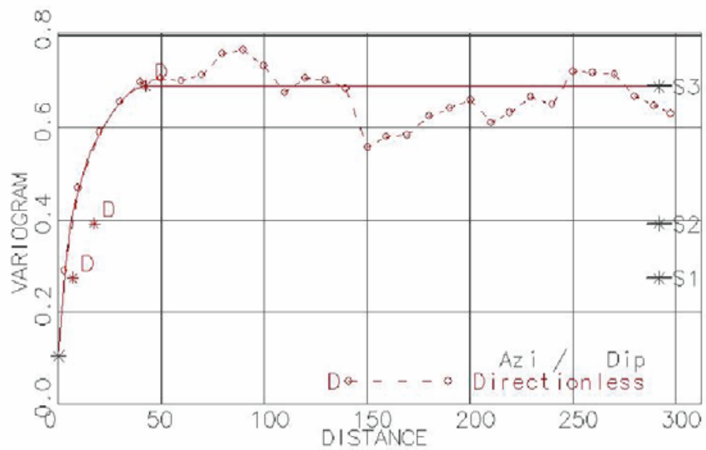
Structure	Range	C Value	Sill
1	3.9	0.0189	0.0289
2	10.3	0.0101	0.0390
3	91.2	0.0360	0.0751



Variogram Grade: Ga2O3 BHID :

3 Structure Isotropic Model. Nugget = 0.0100

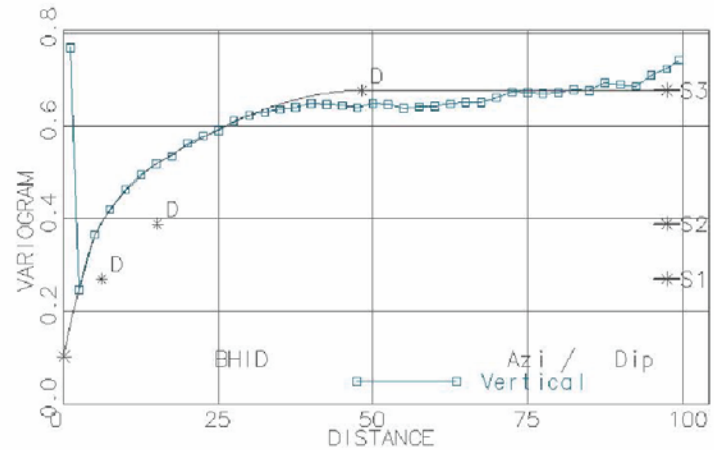
Structure	Range	C Value	Sill
1	6.4	0.0191	0.0291
2	15.2	0.0093	0.0384
3	47.6	0.0365	0.0749



Variogram Grade: HfO2

3 Structure Isotropic Model. Nugget = 0.103

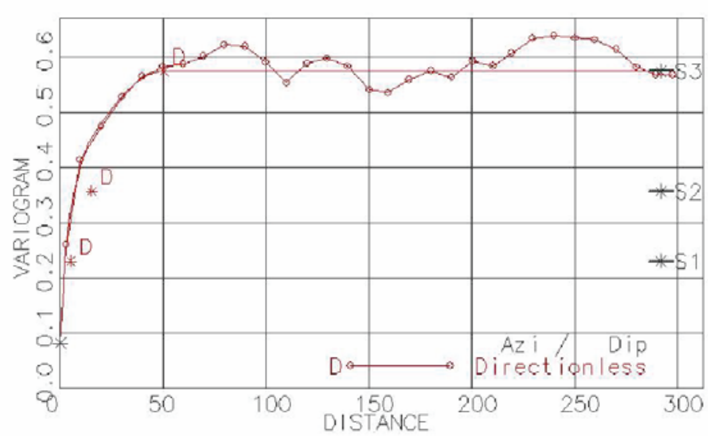
Structure	Range	C Value	Sill
1	7.0	0.170	0.273
2	17.3	0.117	0.390
3	42.6	0.299	0.689



Variogram Grade: HfO2 BHID :

3 Structure Isotropic Model. Nugget = 0.101

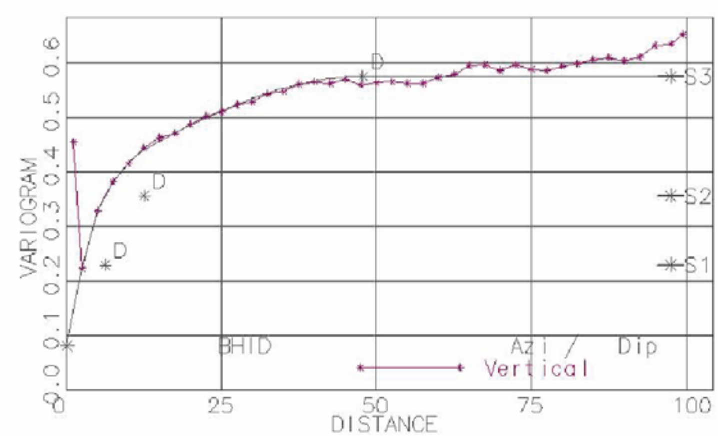
Structure	Range	C Value	Sill
1	6.1	0.168	0.269
2	15.1	0.119	0.388
3	48.1	0.288	0.676



Variogram Grade: ThO2

3 Structure Isotropic Model. Nugget = 0.081

Structure	Range	C Value	Sill
1	5.2	0.149	0.230
2	15.2	0.126	0.357
3	50.4	0.218	0.575



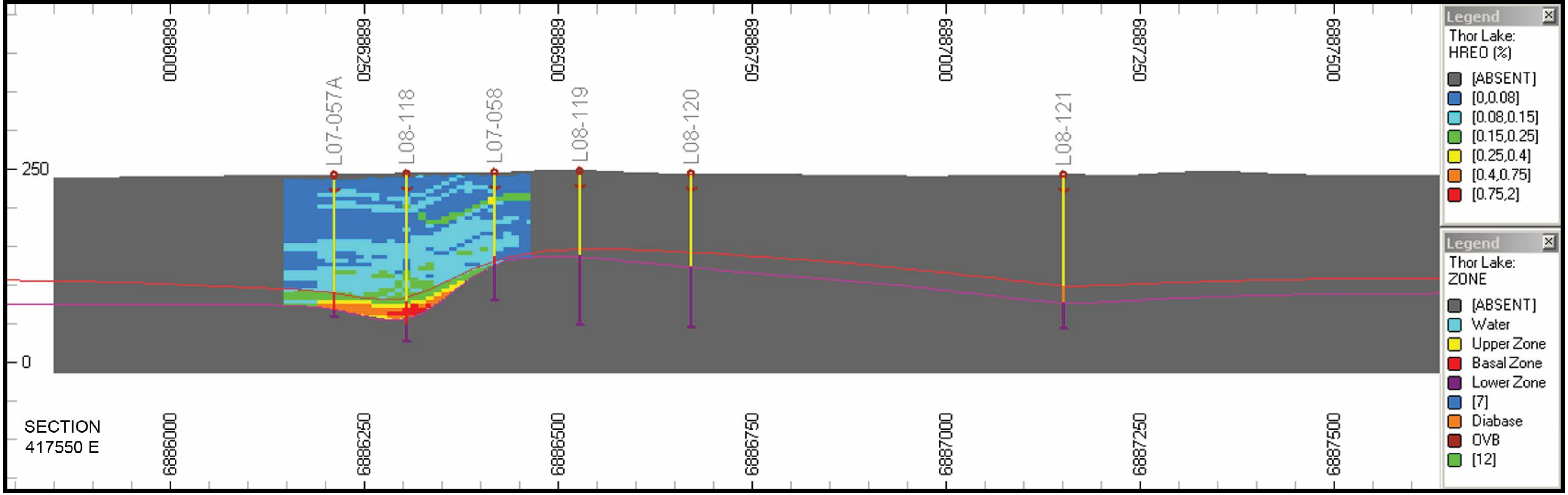
Variogram Grade: ThO2 BHID :

3 Structure Isotropic Model. Nugget = 0.081

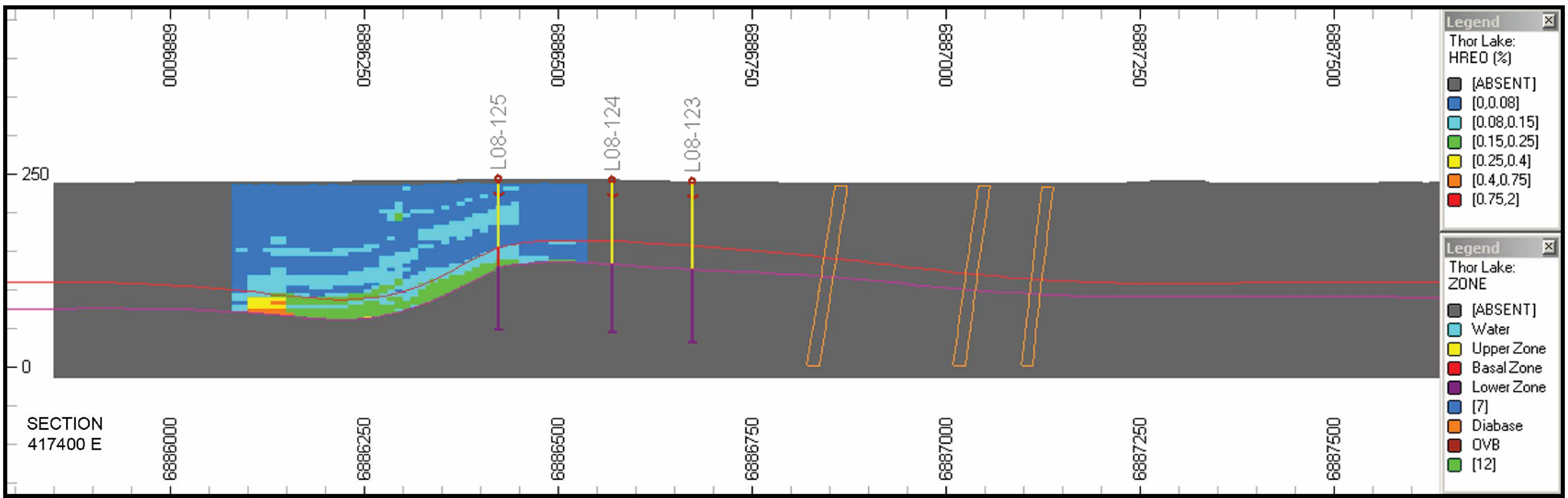
Structure	Range	C Value	Sill
1	6.2	0.148	0.229
2	12.5	0.126	0.356
3	47.7	0.219	0.575

APPENDIX F

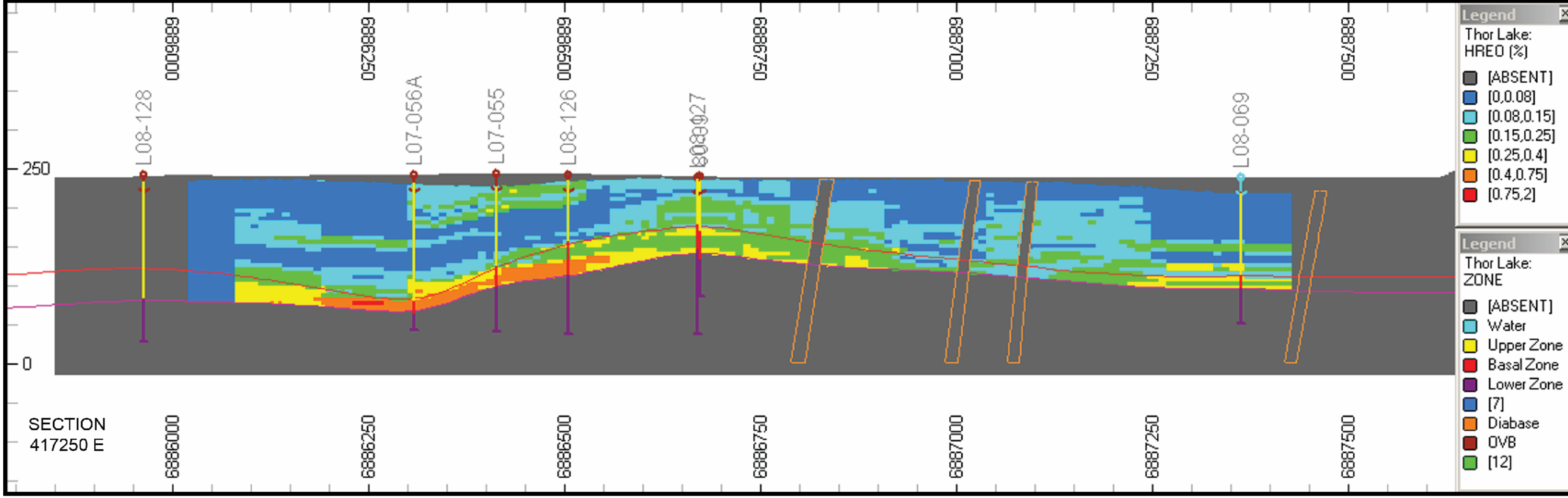
Cross-Sections

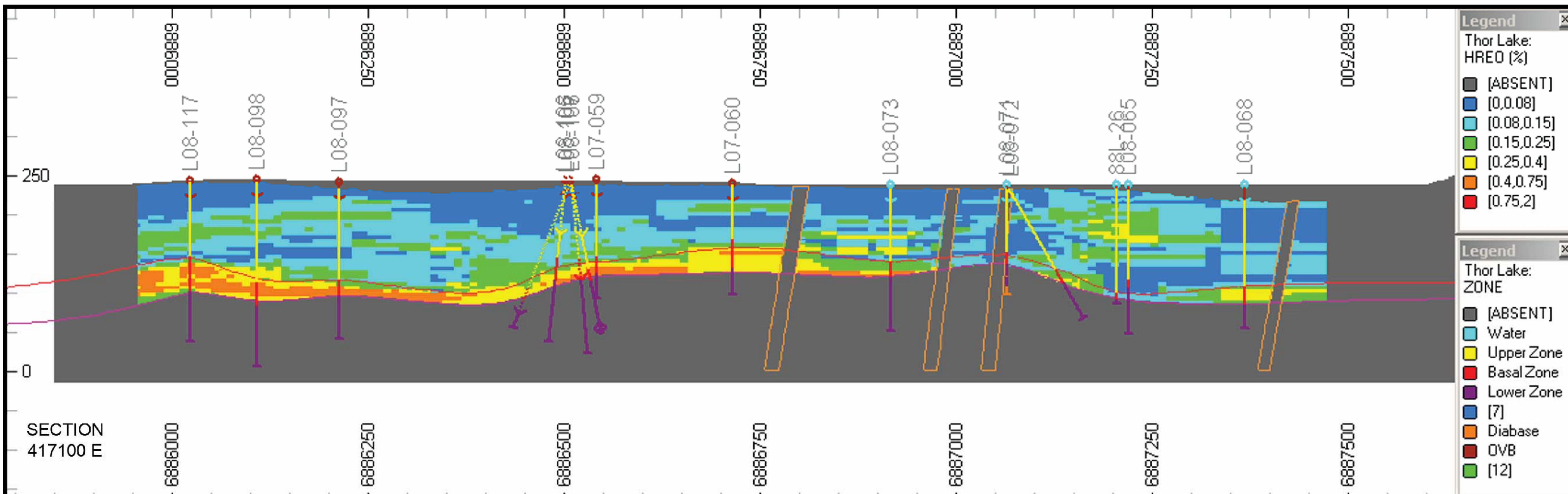


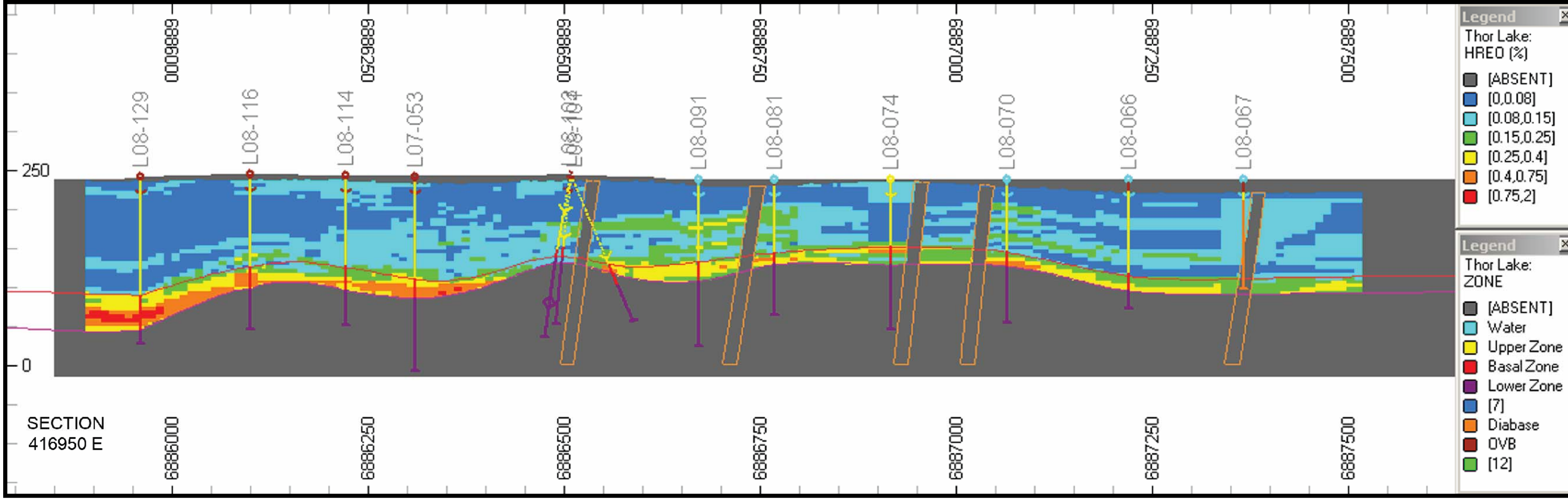
SECTION
417550 E
250
0
6886000
6886250
6886500
6886750
6887000
6887250
6887500
L07-057A
L08-118
L07-058
L08-119
L08-120
L08-121
Legend
Thor Lake:
HREO (%)
[ABSENT]
[0,0.08]
[0.08,0.15]
[0.15,0.25]
[0.25,0.4]
[0.4,0.75]
[0.75,2]
Legend
Thor Lake:
ZONE
[ABSENT]
Water
Upper Zone
Basal Zone
Lower Zone
[7]
Diabase
OVB
[12]

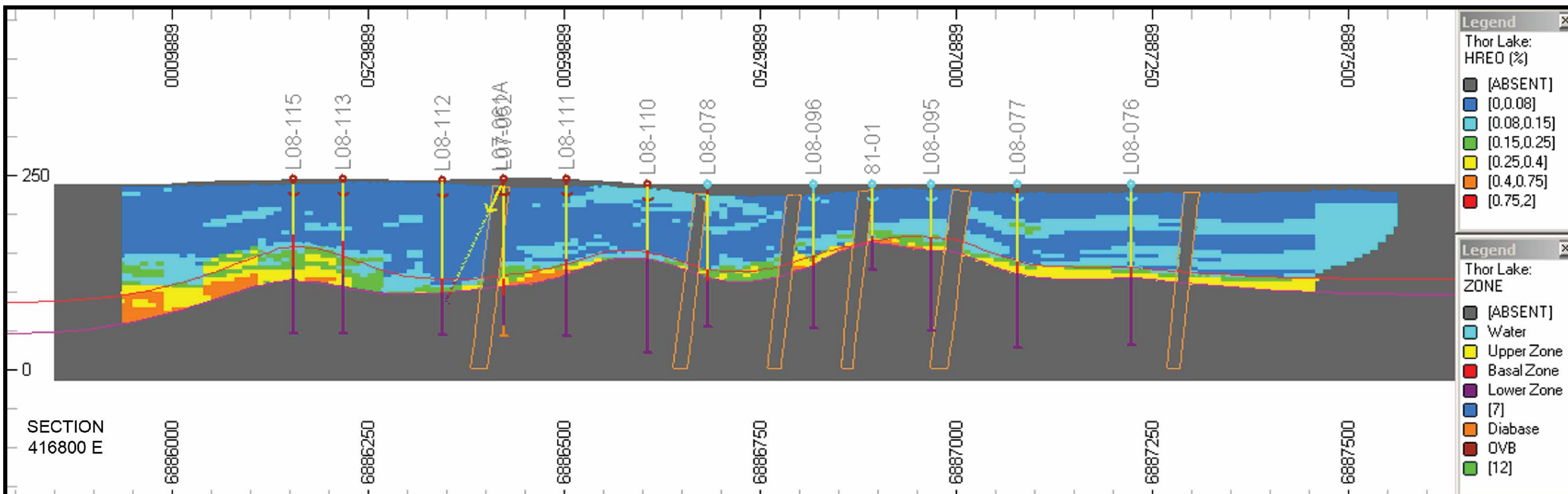


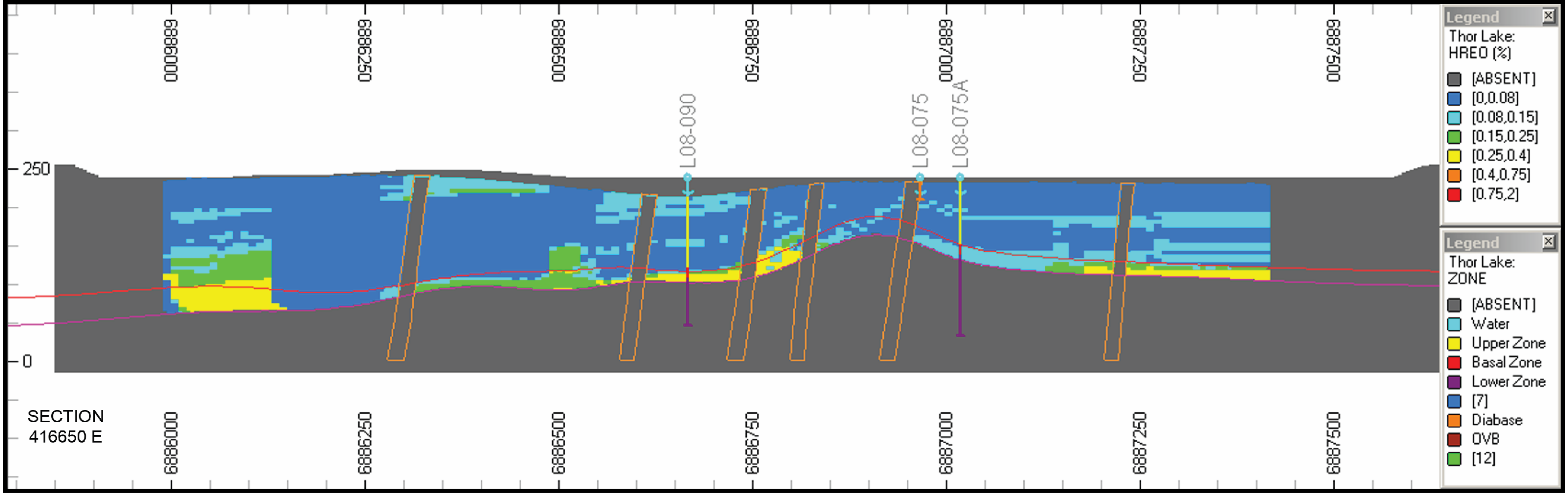
SECTION
417400 E
250
0
6886000
6886250
6886500
6886750
6887000
6887250
6887500
L08-125
L08-124
L08-123
Legend
Thor Lake:
HREO (%)
[ABSENT]
[0,0.08]
[0.08,0.15]
[0.15,0.25]
[0.25,0.4]
[0.4,0.75]
[0.75,2]
Legend
Thor Lake:
ZONE
[ABSENT]
Water
Upper Zone
Basal Zone
Lower Zone
[7]
Diabase
OVB
[12]


SECTION
417250 E
6886000
6886250
6886500
6886750
6887000
6887250
6887500
250
0
L08-128
L07-056A
L07-055
L08-126
L08-069
Legend
Thor Lake:
HREO (%)
[ABSENT]
[0,0.08]
[0.08,0.15]
[0.15,0.25]
[0.25,0.4]
[0.4,0.75]
[0.75,2]
Legend
Thor Lake:
ZONE
[ABSENT]
Water
Upper Zone
Basal Zone
Lower Zone
[7]
Diabase
OVB
[12]

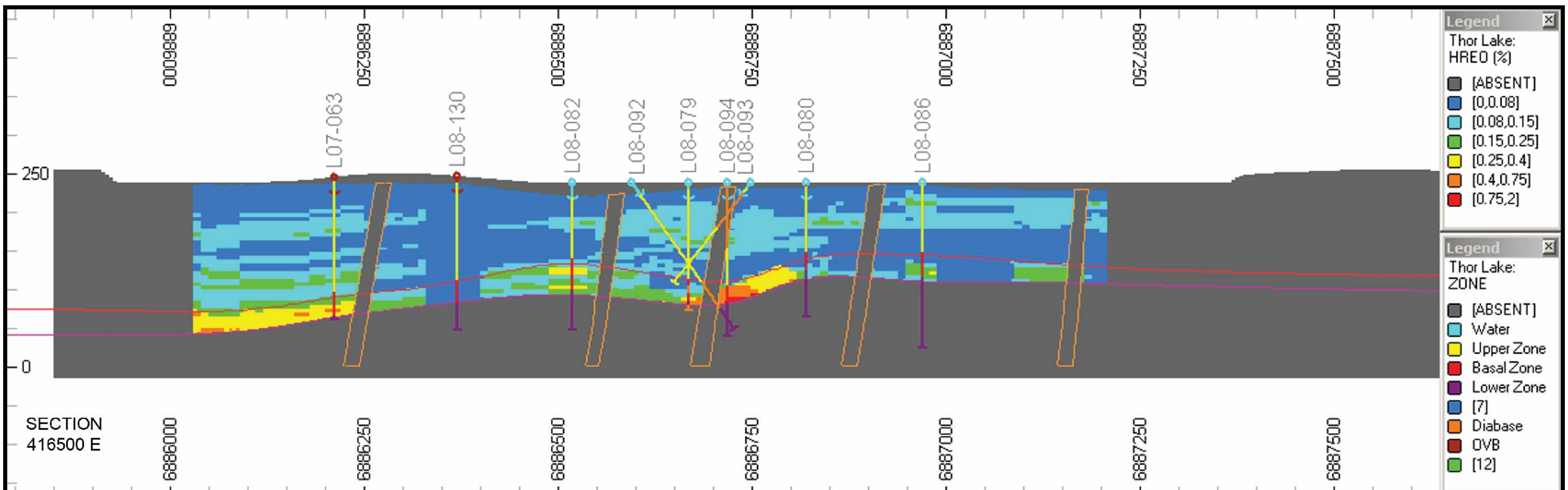

SECTION
417100 E
6886000
6886250
6886500
6886750
6887000
6887250
6887500
250
0
L08-117
L08-098
L08-097
L07-059
L07-060
L08-073
L08-068
Legend
Thor Lake:
HREO (%)
[ABSENT]
[0,0.08]
[0.08,0.15]
[0.15,0.25]
[0.25,0.4]
[0.4,0.75]
[0.75,2]
Legend
Thor Lake:
ZONE
[ABSENT]
Water
Upper Zone
Basal Zone
Lower Zone
[7]
Diabase
OVB
[12]


SECTION
416950 E
250
0
L08-129
L08-116
L08-114
L07-053
L08-091
L08-081
L08-074
L08-070
L08-066
L08-067
6886000
6886250
6886500
6886750
6887000
6887250
6887500
Legend
Thor Lake:
HREO (%)
[ABSENT]
[0,0.08]
[0.08,0.15]
[0.15,0.25]
[0.25,0.4]
[0.4,0.75]
[0.75,2]
Legend
Thor Lake:
ZONE
[ABSENT]
Water
Upper Zone
Basal Zone
Lower Zone
[7]
Diabase
OVB
[12]

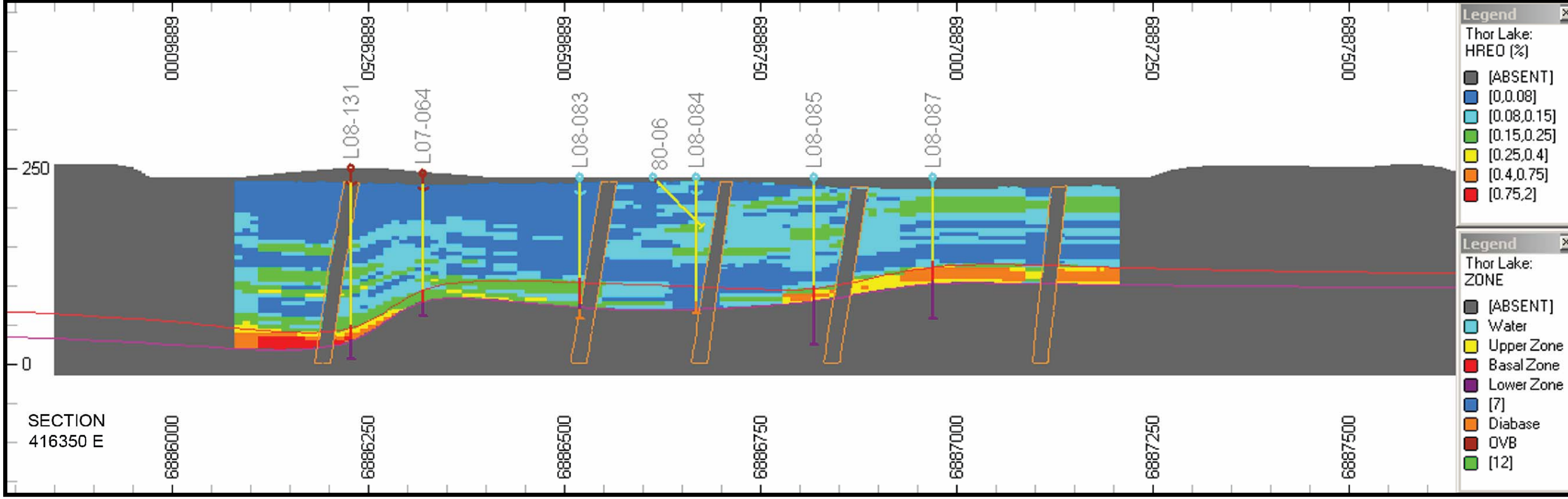

SECTION
416800 E
250
0
L08-115
L08-113
L08-112
L08-111
L08-110
L08-078
L08-096
81-01
L08-095
L08-077
L08-076
6886000
6886250
6886500
6886750
6887000
6887250
6887500
Legend
Thor Lake:
HREO (%)
[ABSENT]
[0,0.08]
[0.08,0.15]
[0.15,0.25]
[0.25,0.4]
[0.4,0.75]
[0.75,2]
Legend
Thor Lake:
ZONE
[ABSENT]
Water
Upper Zone
Basal Zone
Lower Zone
[7]
Diabase
OVB
[12]



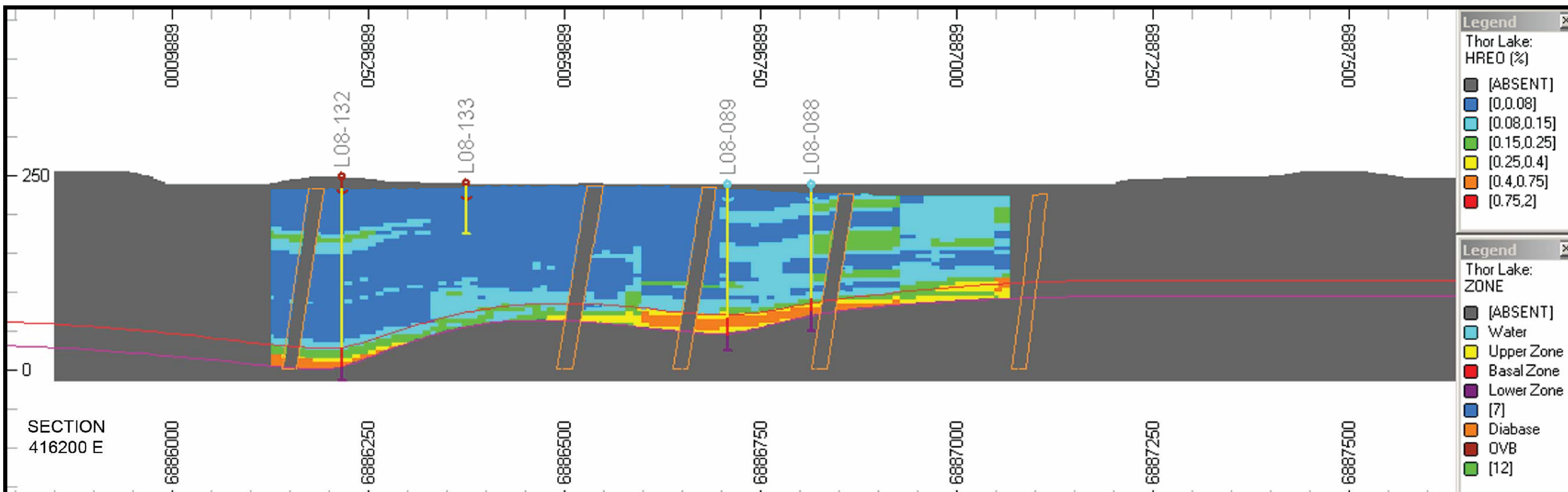
250
0
L08-090
L08-075
L08-075A
SECTION
416650 E
6886000
6886250
6886500
6886750
6887000
6887250
6887500
Legend
Thor Lake:
HREO (%)
[ABSENT]
[0,0.08]
[0.08,0.15]
[0.15,0.25]
[0.25,0.4]
[0.4,0.75]
[0.75,2]
Legend
Thor Lake:
ZONE
[ABSENT]
Water
Upper Zone
Basal Zone
Lower Zone
[7]
Diabase
OVB
[12]



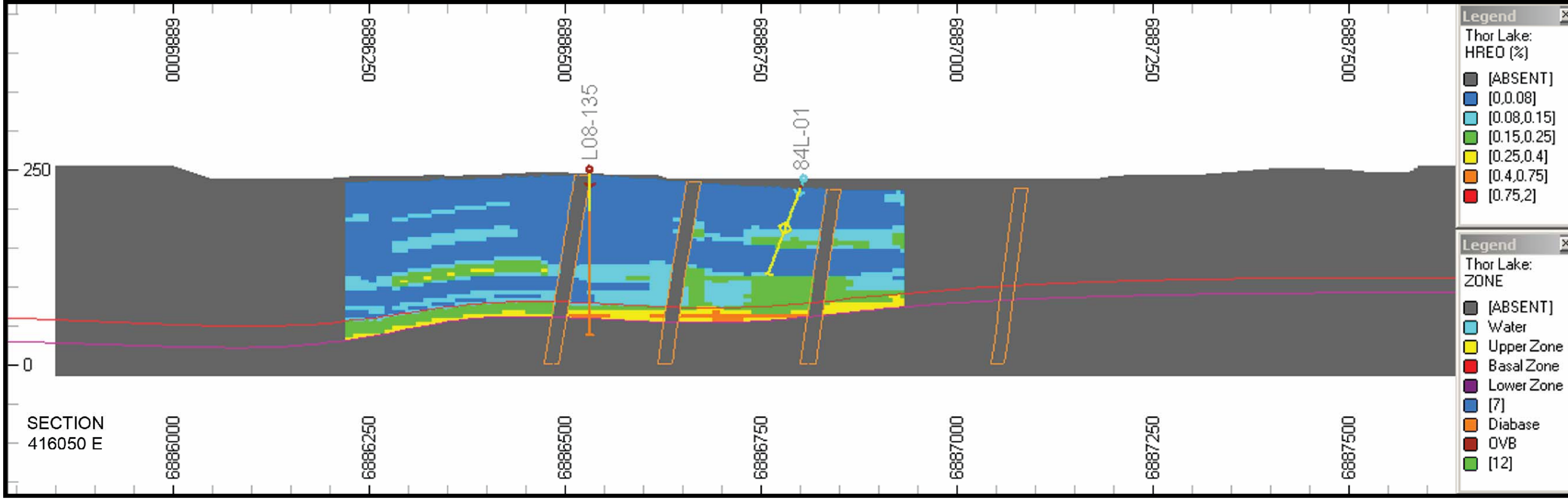
250
0
L07-063
L08-130
L08-082
L08-092
L08-079
L08-094
L08-093
L08-080
L08-086
SECTION
416500 E
6886000
6886250
6886500
6886750
6887000
6887250
6887500
Legend
Thor Lake:
HREO (%)
[ABSENT]
[0,0.08]
[0.08,0.15]
[0.15,0.25]
[0.25,0.4]
[0.4,0.75]
[0.75,2]
Legend
Thor Lake:
ZONE
[ABSENT]
Water
Upper Zone
Basal Zone
Lower Zone
[7]
Diabase
OVB
[12]

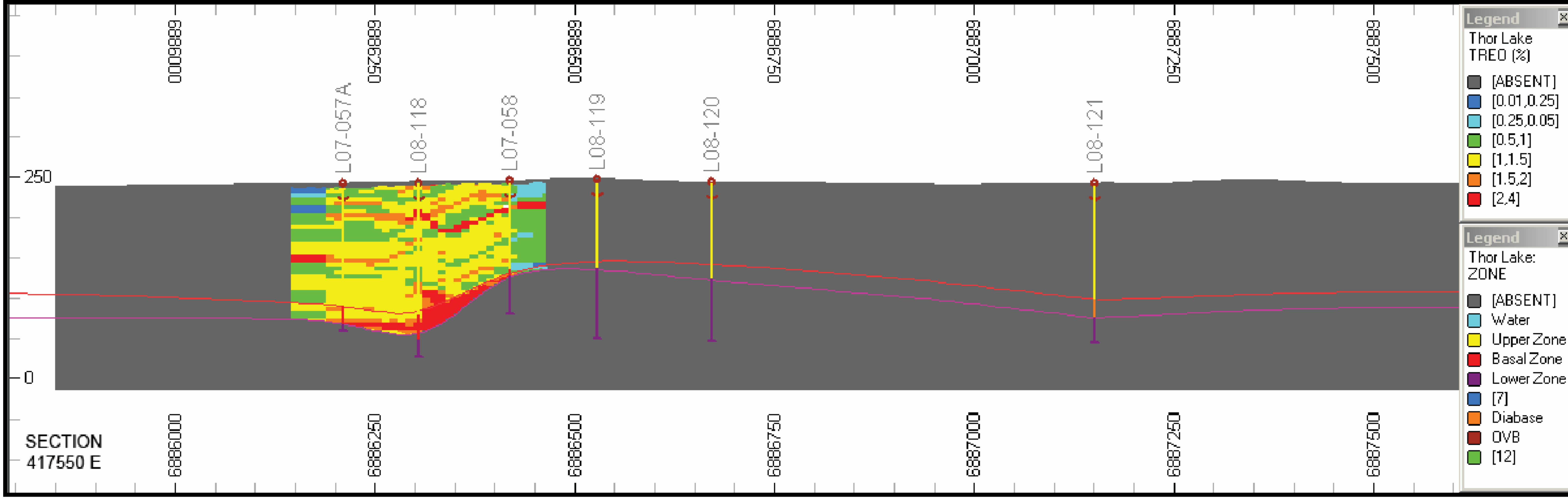


6886000
6886250
6886500
6886750
6887000
6887250
6887500
L08-131
L07-064
L08-083
80-06
L08-084
L08-085
L08-087
250
0
SECTION
416350 E
Legend
Thor Lake:
HREO (%)
[ABSENT]
[0,0.08]
[0.08,0.15]
[0.15,0.25]
[0.25,0.4]
[0.4,0.75]
[0.75,2]
Legend
Thor Lake:
ZONE
[ABSENT]
Water
Upper Zone
Basal Zone
Lower Zone
[7]
Diabase
OVB
[12]

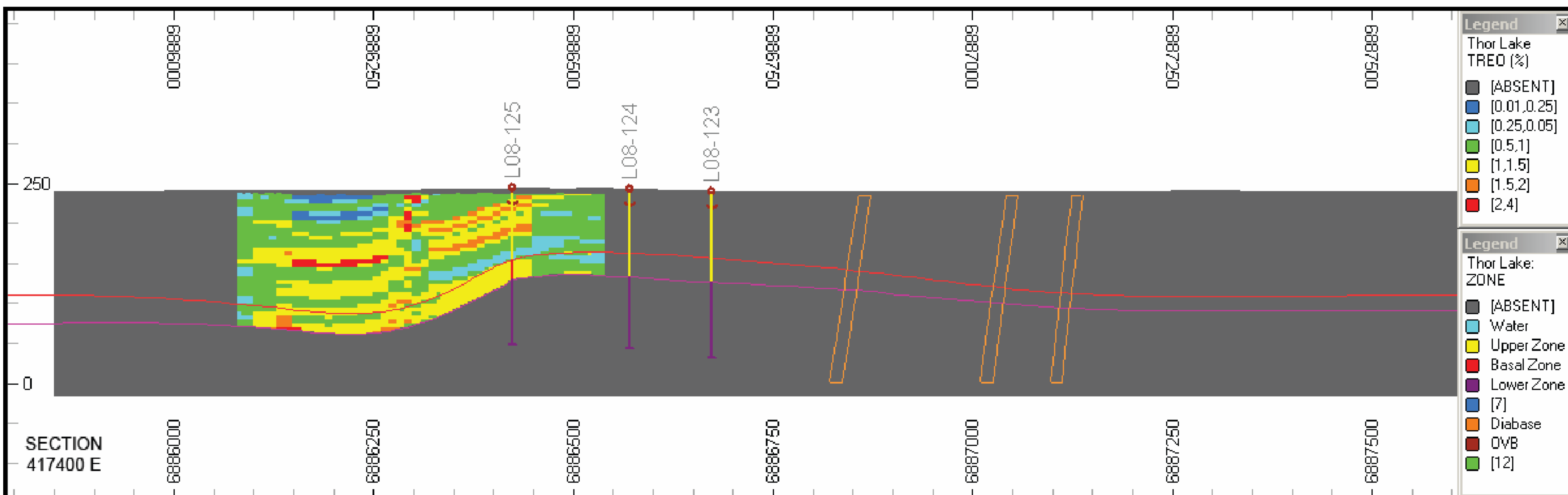


6886000
6886250
6886500
6886750
6887000
6887250
6887500
L08-132
L08-133
L08-089
L08-088
250
0
SECTION
416200 E
Legend
Thor Lake:
HREO (%)
[ABSENT]
[0,0.08]
[0.08,0.15]
[0.15,0.25]
[0.25,0.4]
[0.4,0.75]
[0.75,2]
Legend
Thor Lake:
ZONE
[ABSENT]
Water
Upper Zone
Basal Zone
Lower Zone
[7]
Diabase
OVB
[12]

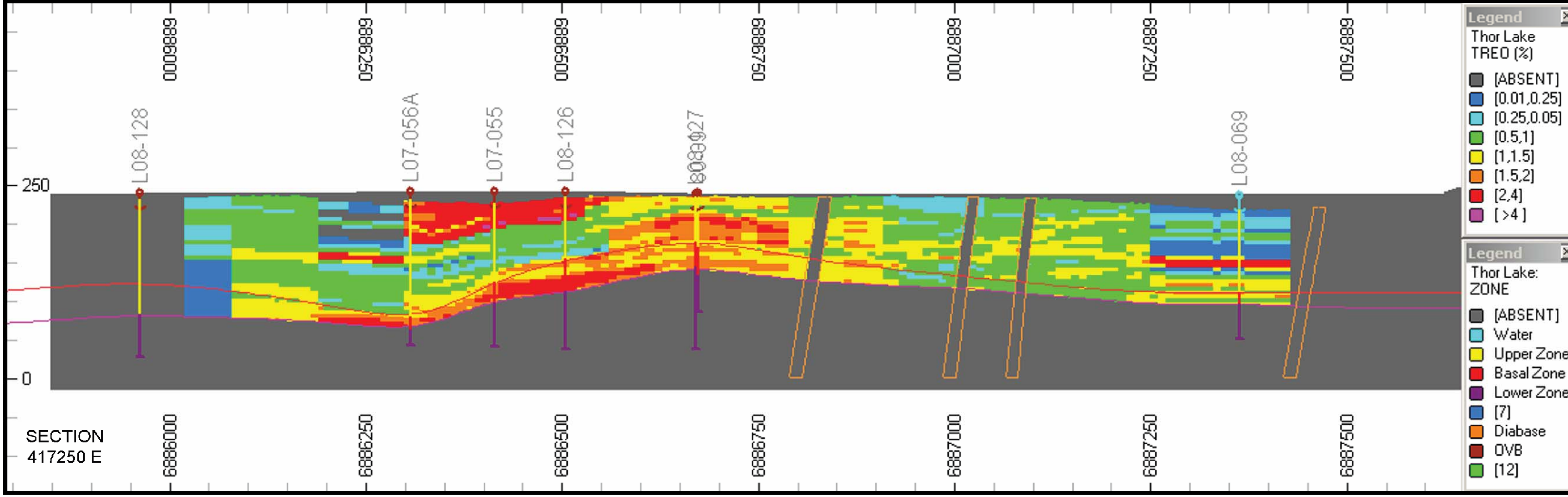

6886000
6886250
6886500
6886750
6887000
6887250
6887500
L08-135
84L-01
250
0
SECTION
416050 E
Legend
Thor Lake:
HREO (%)
[ABSENT]
[0,0.08]
[0.08,0.15]
[0.15,0.25]
[0.25,0.4]
[0.4,0.75]
[0.75,2]
Legend
Thor Lake:
ZONE
[ABSENT]
Water
Upper Zone
Basal Zone
Lower Zone
[7]
Diabase
OVB
[12]

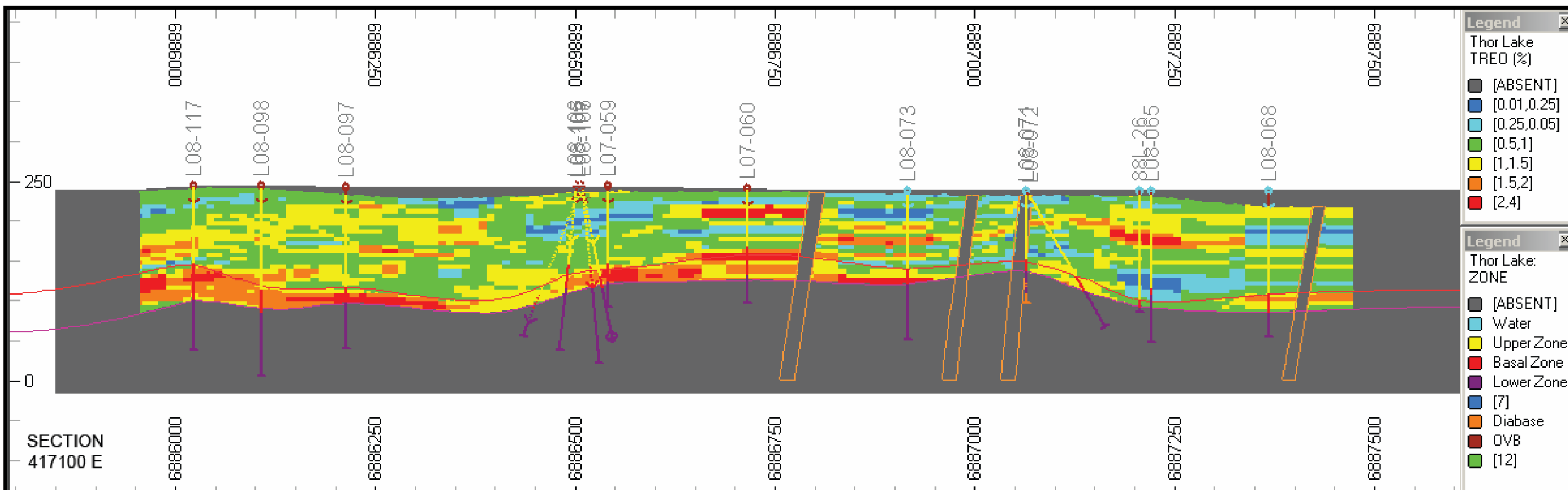


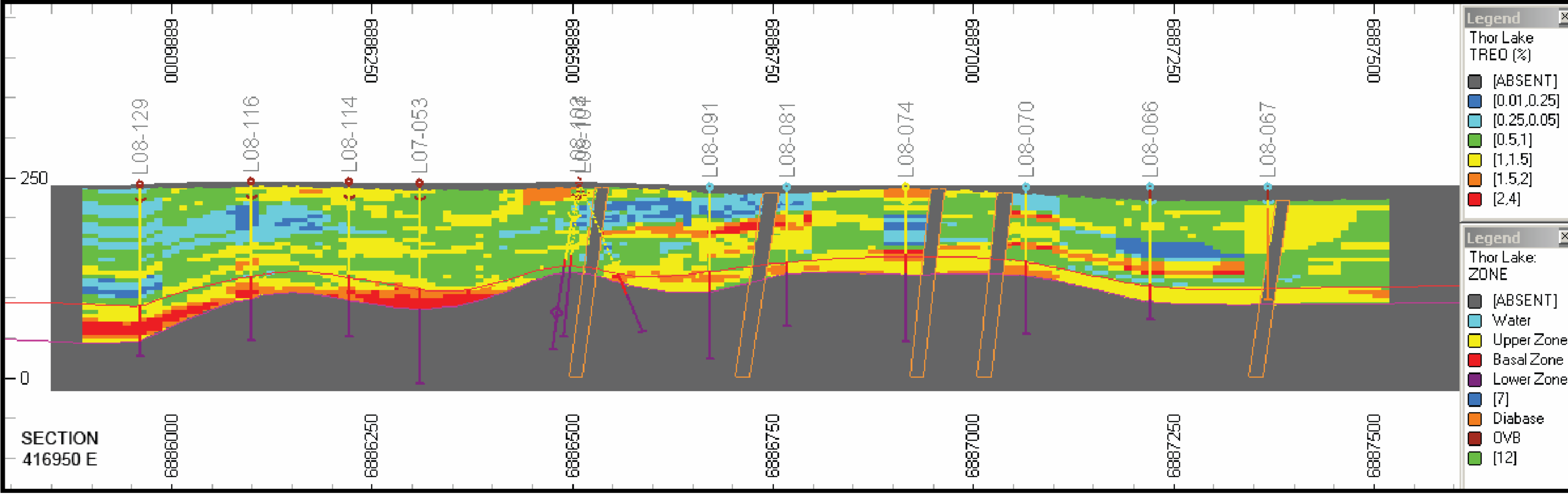
6886000
6886250
6886500
6886750
6887000
6887250
6887500
L07-057A
L08-118
L07-058
L08-119
L08-120
L08-121
250
0
SECTION
417550 E
Legend
Thor Lake
TREO (%)
[ABSENT]
[0.01,0.25]
[0.25,0.05]
[0.5,1]
[1,1.5]
[1.5,2]
[2,4]
Legend
Thor Lake:
ZONE
[ABSENT]
Water
Upper Zone
Basal Zone
Lower Zone
[7]
Diabase
OVB
[12]

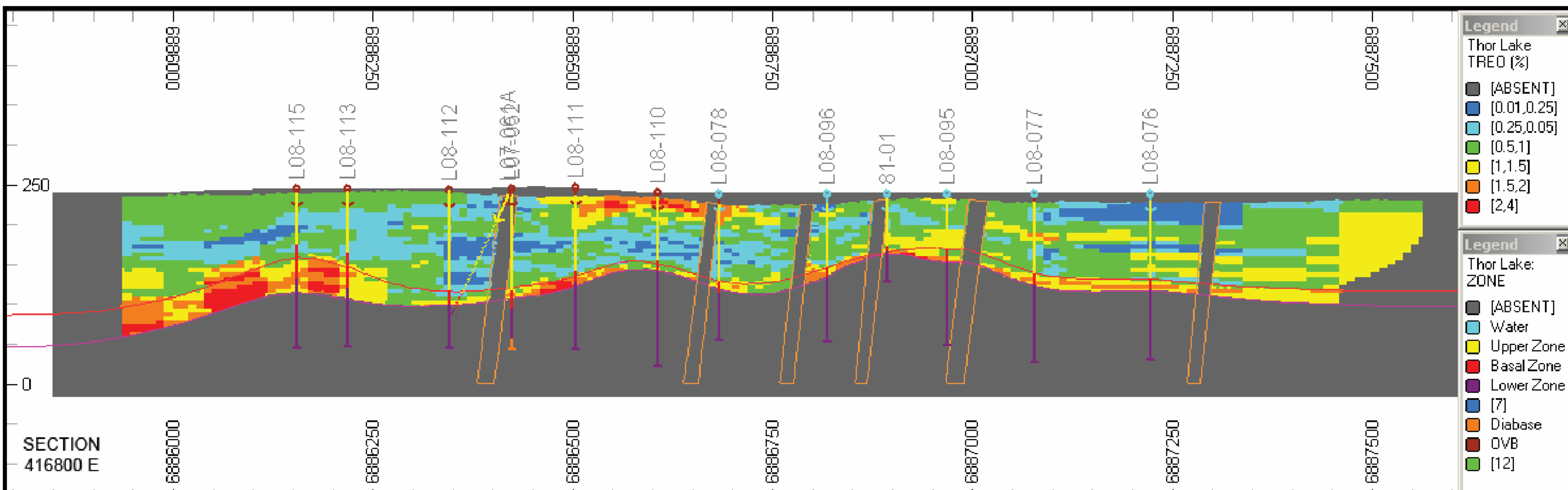


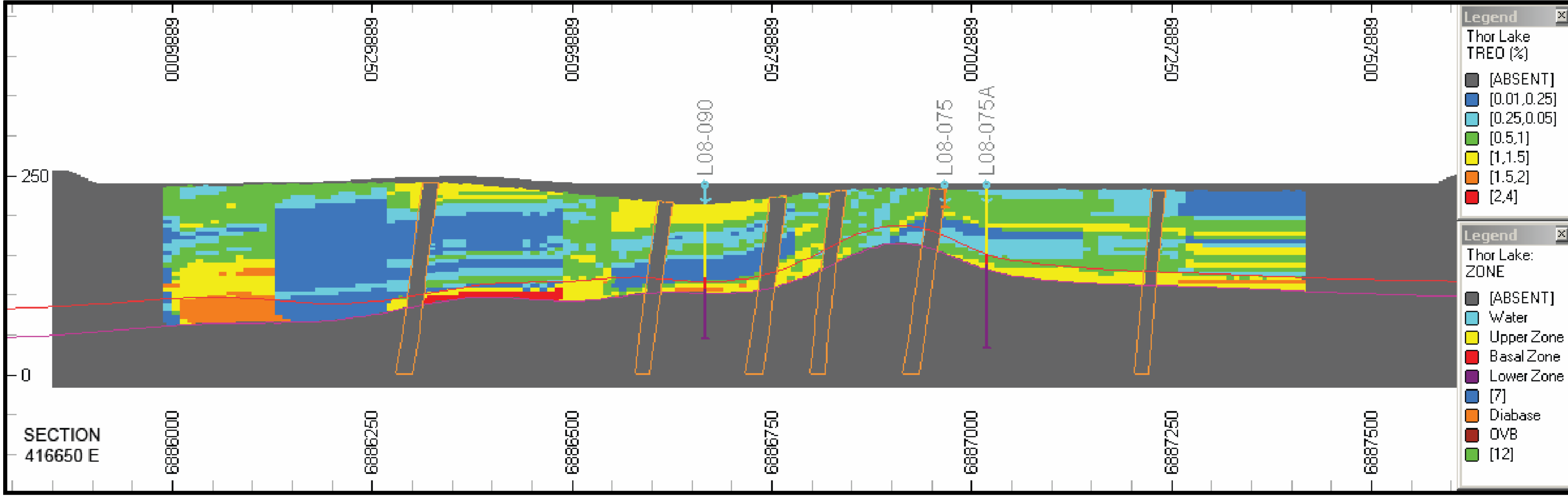
6886000
6886250
6886500
6886750
6887000
6887250
6887500
L08-125
L08-124
L08-123
250
0
SECTION
417400 E
Legend
Thor Lake
TREO (%)
[ABSENT]
[0.01,0.25]
[0.25,0.05]
[0.5,1]
[1,1.5]
[1.5,2]
[2,4]
Legend
Thor Lake:
ZONE
[ABSENT]
Water
Upper Zone
Basal Zone
Lower Zone
[7]
Diabase
OVB
[12]

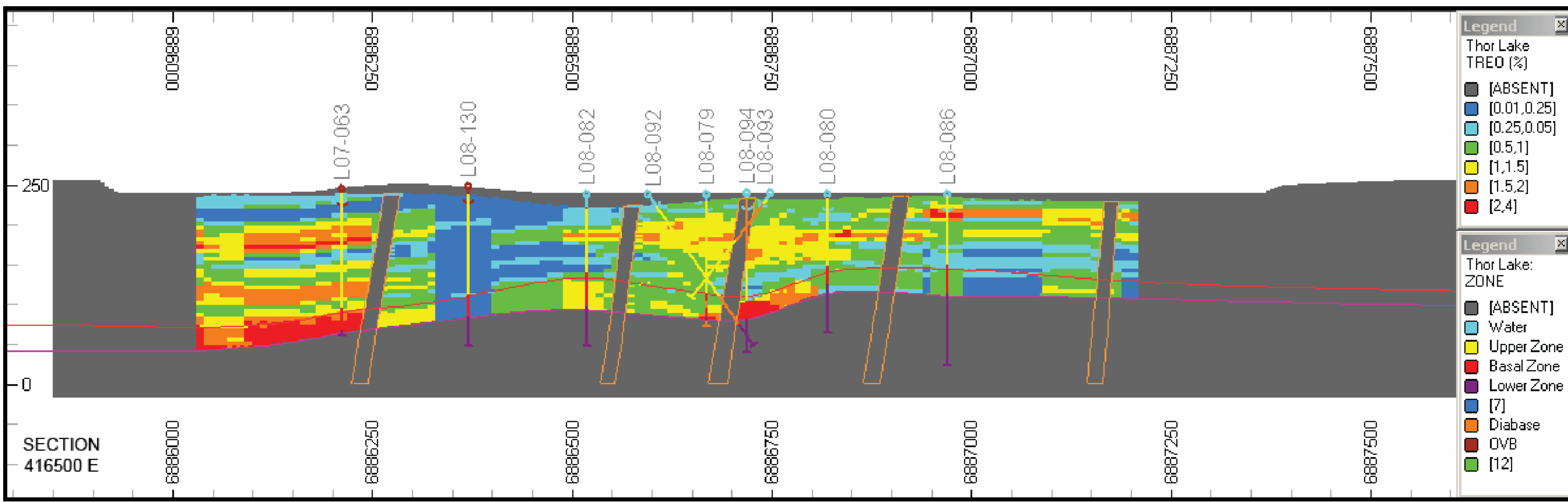

6886000
6886250
6886500
6886750
6887000
6887250
6887500
L08-128
L07-056A
L07-055
L08-126
L08-069
250
0
SECTION
417250 E
Legend
Thor Lake
TREO (%)
[ABSENT]
[0.01,0.25]
[0.25,0.05]
[0.5,1]
[1,1.5]
[1.5,2]
[2,4]
[>4]
Legend
Thor Lake:
ZONE
[ABSENT]
Water
Upper Zone
Basal Zone
Lower Zone
[7]
Diabase
OVB
[12]

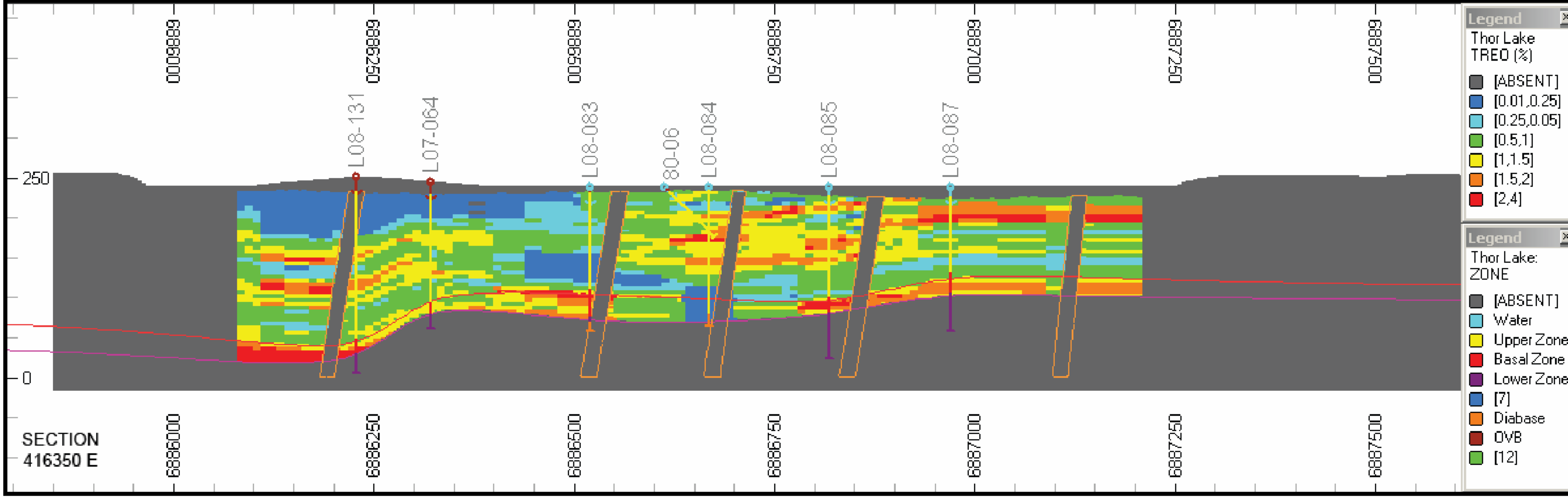

6886000
6886250
6886500
6886750
6887000
6887250
6887500
L08-117
L08-098
L08-097
L07-059
L07-060
L08-073
L08-065
L08-068
250
0
SECTION
417100 E
Legend
Thor Lake
TREO (%)
[ABSENT]
[0.01,0.25]
[0.25,0.05]
[0.5,1]
[1,1.5]
[1.5,2]
[2,4]
Legend
Thor Lake:
ZONE
[ABSENT]
Water
Upper Zone
Basal Zone
Lower Zone
[7]
Diabase
OVB
[12]


SECTION
416950 E
250
0
6886000
6886250
6886500
6886750
6887000
6887250
6887500
L08-129
L08-116
L08-114
L07-053
L08-091
L08-081
L08-074
L08-070
L08-066
L08-067
Legend
Thor Lake
TREO (%)
[ABSENT]
[0.01,0.25]
[0.25,0.05]
[0.5,1]
[1,1.5]
[1.5,2]
[2,4]
Legend
Thor Lake:
ZONE
[ABSENT]
Water
Upper Zone
Basal Zone
Lower Zone
[7]
Diabase
OVB
[12]

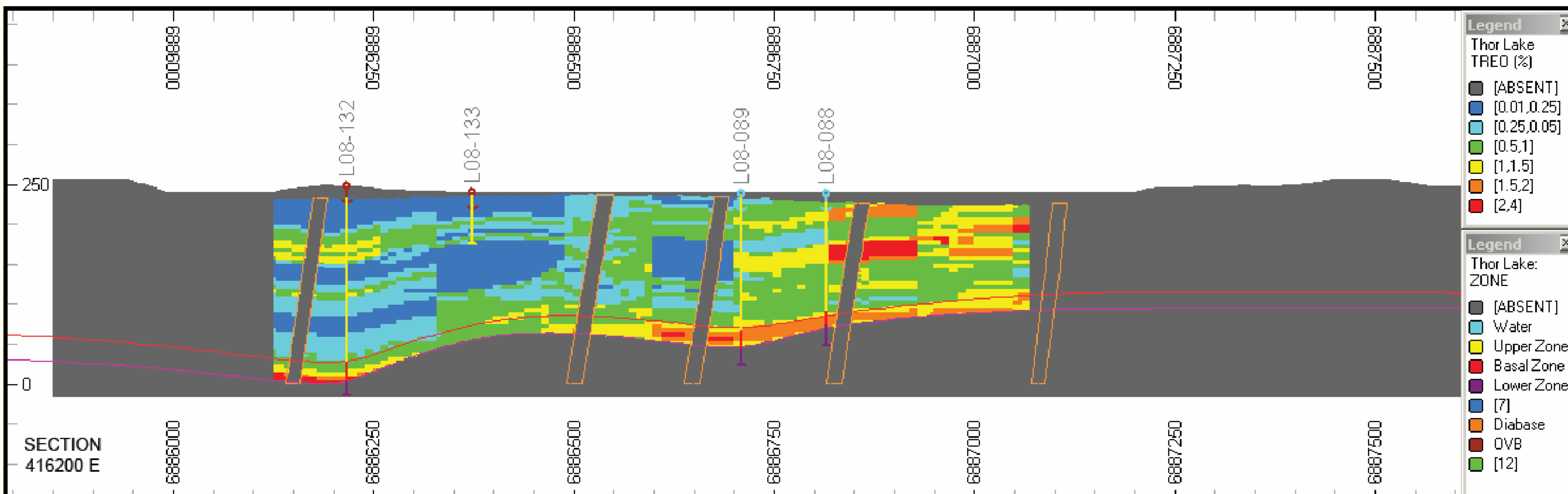

SECTION
416800 E
250
0
6886000
6886250
6886500
6886750
6887000
6887250
6887500
L08-115
L08-113
L08-112
L08-111
L08-110
L08-078
L08-096
81-01
L08-095
L08-077
L08-076
Legend
Thor Lake
TREO (%)
[ABSENT]
[0.01,0.25]
[0.25,0.05]
[0.5,1]
[1,1.5]
[1.5,2]
[2,4]
Legend
Thor Lake:
ZONE
[ABSENT]
Water
Upper Zone
Basal Zone
Lower Zone
[7]
Diabase
OVB
[12]


6886000
6886250
6886500
6886750
6887000
6887250
6887500
L08-090
L08-075
L08-075A
250
0
SECTION
416650 E
Legend
Thor Lake
TREO (%)
[ABSENT]
[0.01,0.25]
[0.25,0.05]
[0.5,1]
[1,1.5]
[1.5,2]
[2,4]
Legend
Thor Lake:
ZONE
[ABSENT]
Water
Upper Zone
Basal Zone
Lower Zone
[7]
Diabase
OVB
[12]

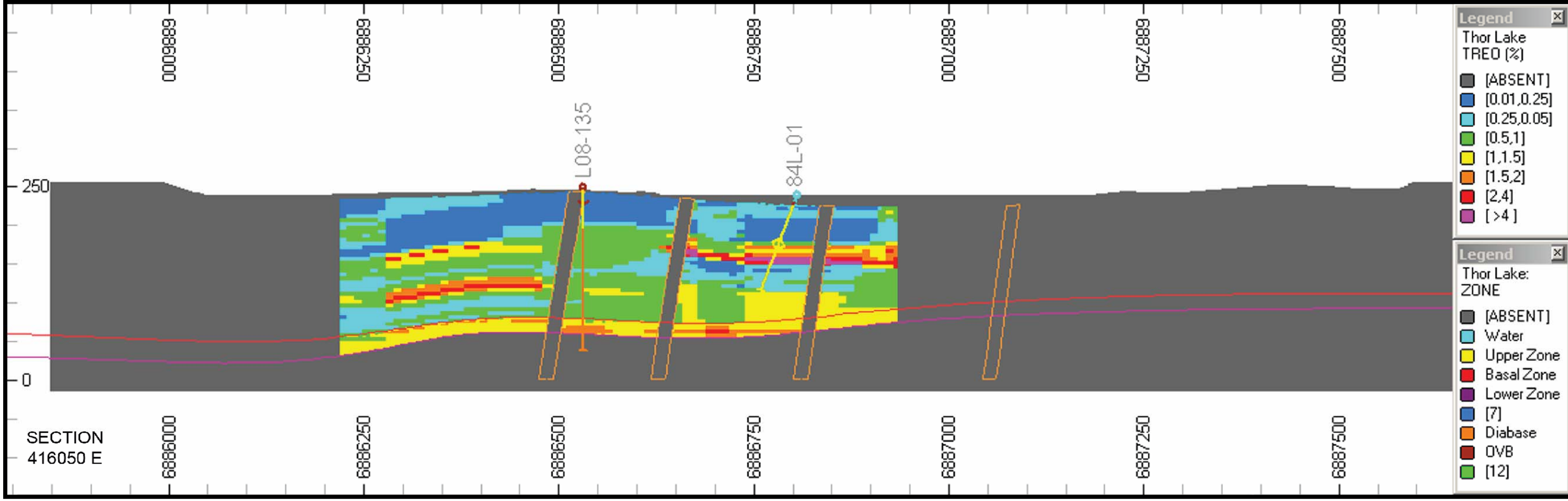

6886000
6886250
6886500
6886750
6887000
6887250
6887500
L07-063
L08-130
L08-082
L08-092
L08-079
L08-094
L08-093
L08-080
L08-086
250
0
SECTION
416500 E
Legend
Thor Lake
TREO (%)
[ABSENT]
[0.01,0.25]
[0.25,0.05]
[0.5,1]
[1,1.5]
[1.5,2]
[2,4]
Legend
Thor Lake:
ZONE
[ABSENT]
Water
Upper Zone
Basal Zone
Lower Zone
[7]
Diabase
OVB
[12]



SECTION
416350 E
250
0
6886000
6886250
6886500
6886750
6887000
6887250
6887500
L08-131
L07-064
L08-083
80-06
L08-084
L08-085
L08-087
Legend
Thor Lake
TREO (%)
[ABSENT]
[0.01,0.25]
[0.25,0.05]
[0.5,1]
[1,1.5]
[1.5,2]
[2,4]
Legend
Thor Lake:
ZONE
[ABSENT]
Water
Upper Zone
Basal Zone
Lower Zone
[7]
Diabase
OVB
[12]



SECTION
416200 E
250
0
6886000
6886250
6886500
6886750
6887000
6887250
6887500
L08-132
L08-133
L08-089
L08-088
Legend
Thor Lake
TREO (%)
[ABSENT]
[0.01,0.25]
[0.25,0.05]
[0.5,1]
[1,1.5]
[1.5,2]
[2,4]
Legend
Thor Lake:
ZONE
[ABSENT]
Water
Upper Zone
Basal Zone
Lower Zone
[7]
Diabase
OVB
[12]



6886000
6886250
6886500
6886750
6887000
6887250
6887500
L08-135
84L-01
250
0
SECTION
416050 E
Legend
Thor Lake
TREO (%)
[ABSENT]
[0.01,0.25]
[0.25,0.05]
[0.5,1]
[1,1.5]
[1.5,2]
[2,4]
[>4]
Legend
Thor Lake:
ZONE
[ABSENT]
Water
Upper Zone
Basal Zone
Lower Zone
[7]
Diabase
OVB
[12]

APPENDIX G

Preliminary Process Operating Cost Estimates
(Unless noted, all Costs are Cdn$)

Appendix G – Preliminary Process Operating Cost Estimates

0851530201-CAL-P0001-00 Updated: Jan. 28, 2009

Table 1- Operation Cost of Process Options Summary

Feed Grade TREO%		0.5		1.5		2		3	
Concentrate Grade TREO%		4.35		5.85		6.59		8.09	
Flotation Metal Recovery TREO%		80	85	80	85	80	85	80	85
Concentrate Mass%		9.2	9.8	20.5	21.8	24.3	25.8	29.7	31.5
Concentrate Tonnage at TREO Output of 4,000 tonnes		101048	101048	75139	75139	66701	66701	54334	54334
Mill Throughtput Required (Tonnes)		1,098,901	1,034,260	366,300	344,753	274,725	258,565	183,150	172,377
Process Option	**Process Discription**	Operating Cost ($/t mill feed)							
Type I	H2SO4 Bake 1:1 acid addition	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8
		60.70	63.39	119.32	125.67	141.28	149.01	176.89	186.84
Type II	Caustic Crack + HCl, 1:1 Caustic addtion, 5.6 t of 37% HCl	Case 9	Case 10	Case 11	Case 12	Case 13	Case 14	Case 15	Case 16
		115.80	121.93	242.22	256.26	286.76	303.58	354.64	375.70
Type III	Caustic Crack + HCl, 0.8:1 Caustic addtion, 3 t of 37% HCl	Case 17	Case 18	Case 19	Case 20	Case 21	Case 22	Case 23	Case 24
		84.41	88.58	**172.21**	**181.87**	203.89	215.53	253.39	268.12
Type IV	Caustic Crack + H2SO4, 0.8:1 Caustic addtion, 1.5 t of 100% H2SO4	Case 25	Case 26	Case 27	Case 28	Case 29	Case 30	Case 31	Case 32
		85.39	89.62	174.40	184.19	206.47	218.28	256.54	271.47

Annual TREO Output = **4,000 tonnes**

Output Options **Leach and SX recovery =** 91%

Equations for Operating Costs ($/t mill feed) at Different Feed Grades to Generate 4000 tonnes TREO output

3000	Feed Grade (% TREO)	0.5	1.5	2	3	**X is mill feed grade in % of TREO**
3500	Process Option Type I Recovery 80%	60.70	119.32	141.28	176.89	$1.6961X^3-16.577X^2+86.26X+21.501$
4000	Process Option Type I Recovery 85%	63.39	125.67	149.01	186.84	$1.8021X^3-17.613X^2+91.651X+21.741$
4500	Process OptionType II Recovery 80%	115.80	242.22	286.76	354.64	$4.3147X^3-42.168X^2+196.74X+27.426$
5000	Process Option Type II Recovery 85%	121.93	256.26	303.58	375.70	$4.5844X^3-44.804X^2+209.04X+28.036$
5500	Process Option Type III Recovery 80%	84.41	172.21	203.89	253.39	$2.8231X^3-27.591X^2+133.81X+24.051$
6000	Process Option Type III Recovery 85%	88.58	181.87	215.53	268.12	$2.9996X^3-29.315X^2+142.17X+24.45$
6500	Process Option Type IV Recovery 80%	85.39	174.40	206.47	256.54	$2.8696X^3-28.045X^2+135.77X+24.156$
7000	Process Option Type IV Recovery 85%	89.62	184.19	218.28	271.47	$3.049X^3-29.798X^2+144.26X+24.562$

Case1 Hydrometallurgical Plant Reagents Cost Process Type I, Head 0.5%, Recovery 80%

101,048 tonnes per year

Reagents	Function	Dosage (kg/t)	Price ($/t)	Annual Tonnage (tonne)	Annual Cost ($)
H2SO4	Baking	1000	210	101,048	21,220,159
D2EHPA	Extractant	0.015	8500	1.55	13,212
Isopar M	Diluent	0.121	3500	12.20	42,685
Tetraphenylborate		0.019	390	1.91	746
Total in 2002 Canadian Dollars					**21,276,802**
Escalated to Current Canadian Dollars (2008)					**24,674,567**

Case 2 Hydrometallurgical Plant Reagents Cost Process Type I, Head 0.5%, Recovery 85%

101,048 tonnes per year

Reagents	Function	Dosage (kg/t)	Price ($/t)	Annual Tonnage (tonne)	Annual Cost ($)
H2SO4	Baking	1000	210	101,048	21,220,159
D2EHPA	Extractant	0.015	8500	1.55	13,212
Isopar M	Diluent	0.121	3500	12.20	42,685
Tetraphenylborate		0.019	390	1.91	746
Total in 2002 Canadian Dollars					**21,276,802**
Escalated to Current Canadian Dollars (2008)					**24,674,567**

Case 3 Hydrometallurgical Plant Reagents Cost Process Type I, Head 1.5%, Recovery 80%

75,139 tonnes per year

Reagents	Function	Dosage (kg/t)	Price ($/t)	Annual Tonnage (tonne)	Annual Cost ($)
H2SO4	Baking	1000	210	75,139	15,779,093
D2EHPA	Extractant	0.015	8500	1.16	9,824
Isopar M	Diluent	0.121	3500	9.07	31,740
Tetraphenylborate		0.019	390	1.42	555
Total in 2002 Canadian Dollars					**15,821,212**
Escalated to Current Canadian Dollars (2008)					**18,347,755**

Case 4 Hydrometallurgical Plant Reagents Cost Process Type I, Head 1.5%, Recovery 85%

75,139 tonnes per year

Reagents	Function	Dosage (kg/t)	Price ($/t)	Annual Tonnage (tonne)	Annual Cost ($)
H2SO4	Baking	1000	210	75,139	15,779,093
D2EHPA	Extractant	0.015	8500	1.16	9,824
Isopar M	Diluent	0.121	3500	9.07	31,740
Tetraphenylborate		0.019	390	1.42	555
Total in 2002 Canadian Dollars					**15,821,212**
Escalated to Current Canadian Dollars (2008)					**18,347,755**

Case 5 Hydrometallurgical Plant Reagents Cost Process Type I, Head 2.0%, Recovery 80%

66,701 tonnes per year

Reagents	Function	Dosage (kg/t)	Price ($/t)	Annual Tonnage (tonne)	Annual Cost ($)
H2SO4	Baking	1000	210	66,701	14,007,237
D2EHPA	Extractant	0.015	8500	1.03	8,721
Isopar M	Diluent	0.121	3500	8.05	28,176
Tetraphenylborate		0.019	390	1.26	492
Total in 2002 Canadian Dollars					**14,044,627**
Escalated to Current Canadian Dollars (2008)					**16,287,461**

Case 6 Hydrometallurgical Plant Reagents Cost Process Type I, Head 2.0%, Recovery 85%

66,701 tonnes per year

Reagents	Function	Dosage (kg/t)	Price ($/t)	Annual Tonnage (tonne)	Annual Cost ($)
H2SO4	Baking	1000	210	66,701	14,007,237
D2EHPA	Extractant	0.015	8500	1.03	8,721
Isopar M	Diluent	0.121	3500	8.05	28,176
Tetraphenylborate		0.019	390	1.26	492
Total in 2002 Canadian Dollars					**14,044,627**
Escalated to Current Canadian Dollars (2008)					**16,287,461**

Case 7 Hydrometallurgical Plant Reagents Cost Process Type I, Head 3.0%, Recovery 80%

54,334 tonnes per year

Reagents	Function	Dosage	Price	Annual Tonnage	Annual Cost
		(kg/t)	($/t)	(tonne)	($)
H2SO4	Baking	1000	210	54,334	11,410,098
D2EHPA	Extractant	0.015	8500	0.84	7,104
Isopar M	Diluent	0.121	3500	6.56	22,952
Tetraphenylborate		0.019	390	1.03	401
Total in 2002 Canadian Dollars					**11,440,555**
Escalated to Current Canadian Dollars (2008)					**13,267,536**

Case 8 Hydrometallurgical Plant Reagents Cost Process Type I, Head 3.0%, Recovery 85%

54,334 tonnes per year

Reagents	Function	Dosage	Price	Annual Tonnage	Annual Cost
		(kg/t)	($/t)	(tonne)	($)
H2SO4	Baking	1000	210	54,334	11,410,098
D2EHPA	Extractant	0.015	8500	0.84	7,104
Isopar M	Diluent	0.121	3500	6.56	22,952
Tetraphenylborate		0.019	390	1.03	401
Total in 2002 Canadian Dollars					**11,440,555**
Escalated to Current Canadian Dollars (2008)					**13,267,536**

Case 9 Hydrometallurgical Plant Reagents Cost Process Type II, Head 0.5%, Recovery 80%

101,048 tonnes per year

Reagents	Function	Dosage	Price	Annual Tonnage	Annual Cost
		(kg/t)	($/t)	(tonne)	($)
NaOH	Cracking	1000	180	101,048	18,188,708
HCl (12N)	Leach	5600	90	565,871	50,928,382
D2EHPA	Extractant	0.015	8500	1.55	13,212
Isopar M	Diluent	0.121	3500	12.20	42,685
Tetraphenylborate		0.019	390	1.91	746
Total in 2002 Canadian Dollars					**69,173,733**
Escalated to Current Canadian Dollars (2008)					**80,220,323**

Case 10 Hydrometallurgical Plant Reagents Cost Process Type II, Head 0.5%, Recovery 85%

101,048 tonnes per year

Reagents	Function	Dosage	Price	Annual Tonnage	Annual Cost
		(kg/t)	($/t)	(tonne)	($)
NaOH	Cracking	1000	180	101,048	18,188,708
HCl (12N)	Leach	5600	90	565,871	50,928,382
D2EHPA	Extractant	0.015	8500	1.55	13,212
Isopar M	Diluent	0.121	3500	12.20	42,685
Tetraphenylborate		0.019	390	1.91	746
Total in 2002 Canadian Dollars					**69,173,733**
Escalated to Current Canadian Dollars (2008)					**80,220,323**

Case 11 Hydrometallurgical Plant Reagents Cost Process Type II, Head 1.5%, Recovery 80%

75,139 tonnes per year

Reagents	Function	Dosage	Price	Annual Tonnage	Annual Cost
		(kg/t)	($/t)	(tonne)	($)
NaOH	Cracking	1000	180	75,139	13,524,937
HCl (12N)	Leach	5600	90	420,776	37,869,822
D2EHPA	Extractant	0.015	8500	1.16	9,824
Isopar M	Diluent	0.121	3500	9.07	31,740
Tetraphenylborate		0.019	390	1.42	555
Total in 2002 Canadian Dollars					**51,436,878**
Escalated to Current Canadian Dollars (2008)					**59,651,009**

Case 12 Hydrometallurgical Plant Reagents Cost Process Type II, Head 1.5%, Recovery 85%

75,139 tonnes per year

Reagents	Function	Dosage	Price	Annual Tonnage	Annual Cost
		(kg/t)	($/t)	(tonne)	($)
NaOH	Cracking	1000	180	75,139	13,524,937
HCl (12N)	Leach	5600	90	420,776	37,869,822
D2EHPA	Extractant	0.015	8500	1.16	9,824
Isopar M	Diluent	0.121	3500	9.07	31,740
Tetraphenylborate		0.019	390	1.42	555
Total in 2002 Canadian Dollars					**51,436,878**
Escalated to Current Canadian Dollars (2008)					**59,651,009**

Case 13 Hydrometallurgical Plant Reagents Cost Process Type II, Head 2.0%, Recovery 80%

66,701 tonnes per year

Reagents	Function	Dosage	Price	Annual Tonnage	Annual Cost
		(kg/t)	($/t)	(tonne)	($)
NaOH	Cracking	1000	180	66,701	12,006,203
HCl (12N)	Leach	5600	90	373,526	33,617,369
D2EHPA	Extractant	0.015	8500	1.03	8,721
Isopar M	Diluent	0.121	3500	8.05	28,176
Tetraphenylborate		0.019	390	1.26	492
Total in 2002 Canadian Dollars					**45,660,962**
Escalated to Current Canadian Dollars (2008)					**52,952,717**

Case 14 Hydrometallurgical Plant Reagents Cost Process Type II, Head 2.0%, Recovery 85%

66,701 tonnes per year

Reagents	Function	Dosage	Price	Annual Tonnage	Annual Cost
		(kg/t)	($/t)	(tonne)	($)
NaOH	Cracking	1000	180	66,701	12,006,203
HCl (12N)	Leach	5600	90	373,526	33,617,369
D2EHPA	Extractant	0.015	8500	1.03	8,721
Isopar M	Diluent	0.121	3500	8.05	28,176
Tetraphenylborate		0.019	390	1.26	492
Total in 2002 Canadian Dollars					**45,660,962**
Escalated to Current Canadian Dollars (2008)					**52,952,717**

Case 15 Hydrometallurgical Plant Reagents Cost Process Type II, Head 3.0%, Recovery 80%

54,334 tonnes per year

Reagents	Function	Dosage	Price	Annual Tonnage	Annual Cost
		(kg/t)	($/t)	(tonne)	($)
NaOH	Cracking	1000	180	54,334	9,780,084
HCl (12N)	Leach	5600	90	304,269	27,384,235
D2EHPA	Extractant	0.015	8500	0.84	7,104
Isopar M	Diluent	0.121	3500	6.56	22,952
Tetraphenylborate		0.019	390	1.03	401
Total in 2002 Canadian Dollars					**37,194,776**
Escalated to Current Canadian Dollars (2008)					**43,134,537**

Case 16 Hydrometallurgical Plant Reagents Cost Process Type II, Head 3.0%, Recovery 85%

54,334 tonnes per year

Reagents	Function	Dosage	Price	Annual Tonnage	Annual Cost
		(kg/t)	($/t)	(tonne)	($)
NaOH	Cracking	1000	180	54,334	9,780,084
HCl (12N)	Leach	5600	90	304,269	27,384,235
D2EHPA	Extractant	0.015	8500	0.84	7,104
Isopar M	Diluent	0.121	3500	6.56	22,952
Tetraphenylborate		0.019	390	1.03	401
Total in 2002 Canadian Dollars					**37,194,776**
Escalated to Current Canadian Dollars (2008)					**43,134,537**

Case 17 Hydrometallurgical Plant Reagents Cost Process Type III, Head 0.5%, Recovery 80%

101,048 tonnes per year

Reagents	Function	Dosage	Price	Annual Tonnage	Annual Cost
		(kg/t)	($/t)	(tonne)	($)
NaOH	Cracking	800	180	80,839	14,550,966
HCl (12N)	Leach	3000	90	303,145	27,283,062
D2EHPA	Extractant	0.015	8500	1.55	13,212
Isopar M	Diluent	0.121	3500	12.20	42,685
Tetraphenylborate		0.019	390	1.91	746
Total in 2002 Canadian Dollars					**41,890,671**
Escalated to Current Canadian Dollars (2008)					**48,580,335**

Case 18 Hydrometallurgical Plant Reagents Cost Process Type III, Head 0.5%, Recovery 85%

101,048 tonnes per year

Reagents	Function	Dosage	Price	Annual Tonnage	Annual Cost
		(kg/t)	($/t)	(tonne)	($)
NaOH	Cracking	800	180	80,839	14,550,966
HCl (12N)	Leach	3000	90	303,145	27,283,062
D2EHPA	Extractant	0.015	8500	1.55	13,212
Isopar M	Diluent	0.121	3500	12.20	42,685
Tetraphenylborate		0.019	390	1.91	746
Total in 2002 Canadian Dollars					**41,890,671**
Escalated to Current Canadian Dollars (2008)					**48,580,335**

Case 19 Hydrometallurgical Plant Reagents Cost Process Type III, Head 1.5%, Recovery 80%

75,139 tonnes per year

Reagents	Function	Dosage	Price	Annual Tonnage	Annual Cost
		(kg/t)	($/t)	(tonne)	($)
NaOH	Cracking	800	180	60,111	10,819,949
HCl (12N)	Leach	3000	90	225,416	20,287,405
D2EHPA	Extractant	0.015	8500	1.16	9,824
Isopar M	Diluent	0.121	3500	9.07	31,740
Tetraphenylborate		0.019	390	1.42	555
Total in 2002 Canadian Dollars					**31,149,473**
Escalated to Current Canadian Dollars (2008)					**36,123,839**

Case 20 Hydrometallurgical Plant Reagents Cost Process Type III, Head 1.5%, Recovery 85%

75,139 tonnes per year

Reagents	Function	Dosage	Price	Annual Tonnage	Annual Cost
		(kg/t)	($/t)	(tonne)	($)
NaOH	Cracking	800	180	60,111	10,819,949
HCl (12N)	Leach	3000	90	225,416	20,287,405
D2EHPA	Extractant	0.015	8500	1.16	9,824
Isopar M	Diluent	0.121	3500	9.07	31,740
Tetraphenylborate		0.019	390	1.42	555
Total in 2002 Canadian Dollars					**31,149,473**
Escalated to Current Canadian Dollars (2008)					**36,123,839**

Case 21 Hydrometallurgical Plant Reagents Cost Process Type III, Head 2.0%, Recovery 80%

66,701 tonnes per year

Reagents	Function	Dosage	Price	Annual Tonnage	Annual Cost
		(kg/t)	($/t)	(tonne)	($)
NaOH	Cracking	800	180	53,361	9,604,963
HCl (12N)	Leach	3000	90	200,103	18,009,305
D2EHPA	Extractant	0.015	8500	1.03	8,721
Isopar M	Diluent	0.121	3500	8.05	28,176
Tetraphenylborate		0.019	390	1.26	492
Total in 2002 Canadian Dollars					**27,651,657**
Escalated to Current Canadian Dollars (2008)					**32,067,444**

Case 22 Hydrometallurgical Plant Reagents Cost Process Type III, Head 2.0%, Recovery 85%

66,701 tonnes per year

Reagents	Function	Dosage	Price	Annual Tonnage	Annual Cost
		(kg/t)	($/t)	(tonne)	($)
NaOH	Cracking	800	180	53,361	9,604,963
HCl (12N)	Leach	3000	90	200,103	18,009,305
D2EHPA	Extractant	0.015	8500	1.03	8,721
Isopar M	Diluent	0.121	3500	8.05	28,176
Tetraphenylborate		0.019	390	1.26	492
Total in 2002 Canadian Dollars					**27,651,657**
Escalated to Current Canadian Dollars (2008)					**32,067,444**

Case 23 Hydrometallurgical Plant Reagents Cost Process Type III, Head 3.0%, Recovery 80%

54,334 tonnes per year

Reagents	Function	Dosage	Price	Annual Tonnage	Annual Cost
		(kg/t)	($/t)	(tonne)	($)
NaOH	Cracking	800	180	43,467	7,824,067
HCl (12N)	Leach	3000	90	163,001	14,670,126
D2EHPA	Extractant	0.015	8500	0.84	7,104
Isopar M	Diluent	0.121	3500	6.56	22,952
Tetraphenylborate		0.019	390	1.03	401
Total in 2002 Canadian Dollars					**22,524,650**
Escalated to Current Canadian Dollars (2008)					**26,121,688**

Case 24 Hydrometallurgical Plant Reagents Cost Process Type III, Head 3.0%, Recovery 85%

54,334 tonnes per year

Reagents	Function	Dosage	Price	Annual Tonnage	Annual Cost
		(kg/t)	($/t)	(tonne)	($)
NaOH	Cracking	800	180	43,467	7,824,067
HCl (12N)	Leach	3000	90	163,001	14,670,126
D2EHPA	Extractant	0.015	8500	0.84	7,104
Isopar M	Diluent	0.121	3500	6.56	22,952
Tetraphenylborate		0.019	390	1.03	401
Total in 2002 Canadian Dollars					**22,524,650**
Escalated to Current Canadian Dollars (2008)					**26,121,688**

Case 25 Hydrometallurgical Plant Reagents Cost Process Type IV, Head 0.5%, Recovery 80%

101,048 tonnes per year

Reagents	Function	Dosage	Price	Annual Tonnage	Annual Cost
		(kg/t)	($/t)	(tonne)	($)
NaOH	Cracking	800	204	80,839	16,463,083
H2SO4 (100%)	Leach	1500	210	151,573	31,830,239
D2EHPA	Extractant	0.015	9617	1.55	14,948
Isopar M	Diluent	0.121	3960	12.20	48,294
Tetraphenylborate		0.019	441	1.91	844
Total in 2007 Canadian Dollars					**48,357,408**
Escalated to Current Canadian Dollars (2008)					**49,566,343**

Case 26 Hydrometallurgical Plant Reagents Cost Process Type VI, Head 0.5%, Recovery 85%

101,048 tonnes per year

Reagents	Function	Dosage	Price	Annual Tonnage	Annual Cost
		(kg/t)	($/t)	(tonne)	($)
NaOH	Cracking	800	204	80,839	16,463,083
H2SO4 (100%)	Leach	1500	210	151,573	31,830,239
D2EHPA	Extractant	0.015	9617	1.55	14,948
Isopar M	Diluent	0.121	3960	12.20	48,294
Tetraphenylborate		0.019	441	1.91	844
Total in 2007 Canadian Dollars					**48,357,408**
Escalated to Current Canadian Dollars (2008)					**49,566,343**

Case 27 Hydrometallurgical Plant Reagents Cost Process Type IV, Head 1.5%, Recovery 80%

75,139 tonnes per year

Reagents	Function	Dosage	Price	Annual Tonnage	Annual Cost
		(kg/t)	($/t)	(tonne)	($)
NaOH	Cracking	800	204	60,111	12,241,779
H2SO4 (100%)	Leach	1500	210	112,708	23,668,639
D2EHPA	Extractant	0.015	9617	1.16	11,115
Isopar M	Diluent	0.121	3960	9.07	35,911
Tetraphenylborate		0.019	441	1.42	628
Total in 2007 Canadian Dollars					**35,958,072**
Escalated to Current Canadian Dollars (2008)					**36,857,024**

Case 28 Hydrometallurgical Plant Reagents Cost Process Type IV, Head 1.5%, Recovery 85%

75,139 tonnes per year

Reagents	Function	Dosage	Price	Annual Tonnage	Annual Cost
		(kg/t)	($/t)	(tonne)	($)
NaOH	Cracking	800	204	60,111	12,241,779
H2SO4 (100%)	Leach	1500	210	112,708	23,668,639
D2EHPA	Extractant	0.015	9617	1.16	11,115
Isopar M	Diluent	0.121	3960	9.07	35,911
Tetraphenylborate		0.019	441	1.42	628
Total in 2007 Canadian Dollars					**35,958,072**
Escalated to Current Canadian Dollars (2008)					**36,857,024**

Case 29 Hydrometallurgical Plant Reagents Cost Process Type IV, Head 2.0%, Recovery 80%

66,701 tonnes per year

Reagents	Function	Dosage	Price	Annual Tonnage	Annual Cost
		(kg/t)	($/t)	(tonne)	($)
NaOH	Cracking	800	204	53,361	10,867,134
H2SO4 (100%)	Leach	1500	210	100,052	21,010,856
D2EHPA	Extractant	0.015	9617	1.03	9,867
Isopar M	Diluent	0.121	3960	8.05	31,878
Tetraphenylborate		0.019	441	1.26	557
Total in 2007 Canadian Dollars					**31,920,292**
Escalated to Current Canadian Dollars (2008)					**32,718,299**

Case 30 Hydrometallurgical Plant Reagents Cost Process Type IV, Head 2.0%, Recovery 85%

66,701 tonnes per year

Reagents	Function	Dosage	Price	Annual Tonnage	Annual Cost
		(kg/t)	($/t)	(tonne)	($)
NaOH	Cracking	800	204	53,361	10,867,134
H2SO4 (100%)	Leach	1500	210	100,052	21,010,856
D2EHPA	Extractant	0.015	9617	1.03	9,867
Isopar M	Diluent	0.121	3960	8.05	31,878
Tetraphenylborate		0.019	441	1.26	557
Total in 2007 Canadian Dollars					**31,920,292**
Escalated to Current Canadian Dollars (2008)					**32,718,299**

Case 31 Hydrometallurgical Plant Reagents Cost Process Type IV, Head 3.0%, Recovery 80%

54,334 tonnes per year

Reagents	Function	Dosage	Price	Annual Tonnage	Annual Cost
		(kg/t)	($/t)	(tonne)	($)
NaOH	Cracking	800	204	43,467	8,852,214
H2SO4 (100%)	Leach	1500	210	81,501	17,115,147
D2EHPA	Extractant	0.015	9617	0.84	8,038
Isopar M	Diluent	0.121	3960	6.56	25,968
Tetraphenylborate		0.019	441	1.03	454
Total in 2007 Canadian Dollars					**26,001,820**
Escalated to Current Canadian Dollars (2008)					**26,651,866**

Case 32 Hydrometallurgical Plant Reagents Cost Process Type IV, Head 3.0%, Recovery 85%

54,334 tonnes per year

Reagents	Function	Dosage	Price	Annual Tonnage	Annual Cost
		(kg/t)	($/t)	(tonne)	($)
NaOH	Cracking	800	204	43,467	8,852,214
H2SO4 (100%)	Leach	1500	210	81,501	17,115,147
D2EHPA	Extractant	0.015	9617	0.84	8,038
Isopar M	Diluent	0.121	3960	6.56	25,968
Tetraphenylborate		0.019	441	1.03	454
Total in 2007 Canadian Dollars					**26,001,820**
Escalated to Current Canadian Dollars (2008)					**26,651,866**

Process Operating Cost, Cases 1 to 8

Annual Throughput (tonnes)	1098901	1034260	366300	344753	274725	258565	183150	172377
Concentrate Tonnes	101048	101048	75139	75139	66701	66701	54334	54334
Flotation Plant Operating Cost	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8
Variable	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost
	(CND$)	(CND$)	(CND$)	(CND$)	(CND$)	(CND$)	(CND$)	(CND$)
Salary	2716494	2716494	2716494	2716494	2716494	2716494	2716494	2716494
Grinding Media and Maintenance Supplies	2527473	2378798	842491	792933	631868	594699	421245	396466
Power	6263736	5895281	2087912	1965094	1565934	1473820	1043956	982547
Flotation Reagent	7761025	7304494	2587008	2434831	1940256	1826124	1293504	1217416
Tails Disposal	1098901	1034260	366300	344753	274725	258565	183150	172377
Subtotal	20367629	19329327	8600206	8254105	7129278	6869703	5658350	5485300
Concentrate Transport	0							
Flotation Concentrate	10407983	10407983	7739269	7739269	6870216	6870216	5596381	5596381
Subtotal	10407983	10407983	7739269	7739269	6870216	6870216	5596381	5596381
Chemical & SX Plant Operating Cost								
Salary	3344969	3344969	3344969	3344969	3344969	3344969	3344969	3344969
Consumable	895853	895853	666147	666147	591345	591345	481701	481701
Chemicals	24674567	24674567	18347755	18347755	16287461	16287461	13267536	13267536
Subtotal	28915390	28915390	22358872	22358872	20223775	20223775	17094206	17094206
Fixed Cost								
G & A @ 4% of variable	2387640	2346108	1547934	1534090	1368931	1358548	1133958	1127036
Marketing @ 5% of variable	2984550	2932635	1934917	1917612	1711163	1698185	1417447	1408794
Camp Operation at $35/manday	166075	166075	166075	166075	166075	166075	166075	166075
Transportation Yellowknife↔Site @ 500 per one way trip	52000	52000	52000	52000	52000	52000	52000	52000
Plant Insurance	400000	400000	400000	400000	400000	400000	400000	400000
Freight of supplies @ 40 per tonne	171121	161055	57040	53685	42780	40264	28520	26842
Winter Road Yellowknife and Hay River to Site	300000	300000	300000	300000	300000	300000	300000	300000
Outside Travel	50000	50000	50000	50000	50000	50000	50000	50000
Head Office Cost	500000	500000	500000	500000	500000	500000	500000	500000
Subtotal	7011386	6907873	5007967	4973462	4590949	4565071	4048000	4030747
Over All Process Operating Cost	66702388	65560573	43706313	43325708	38814219	38528765	32396938	32206635
Cost per Tonne of Mill Feed	61	63	119	126	141	149	177	187
Cost per Tonne of TREO Produced	16676	16390	10927	10831	9704	9632	8099	8052
	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8

Process Operating Costs, Cases 9 to 16

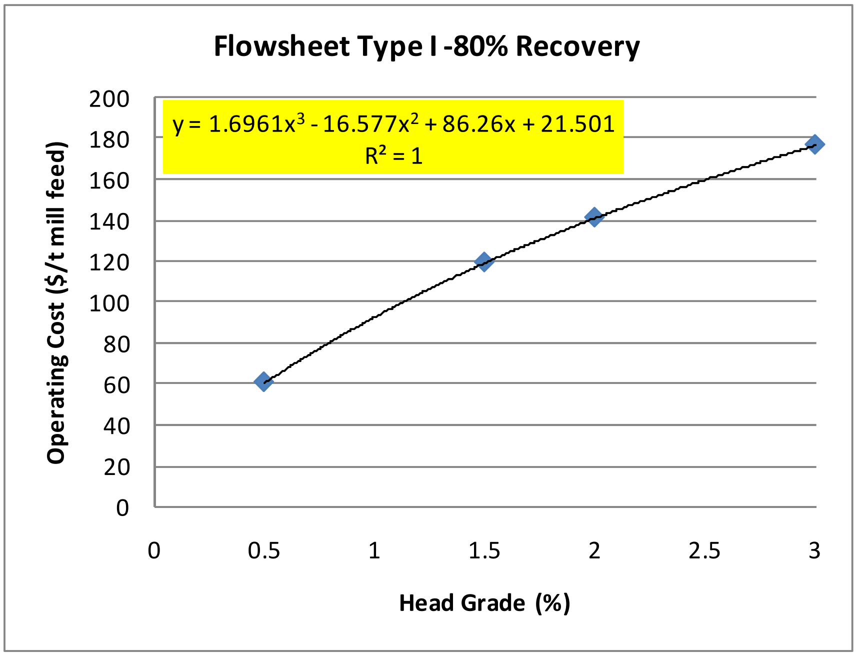
Annual Throughput (tonnes)	1098901	1034260	366300	344753	274725	258565	183150	172377
Concentrate Tonnes	101048	101048	75139	75139	66701	66701	54334	54334
Flotation Plant Operating Cost	Case 9	Case 10	Case 11	Case 12	Case 13	Case 14	Case 15	Case 16
Variable	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost
	(CND$)	(CND$)	(CND$)	(CND$)	(CND$)	(CND$)	(CND$)	(CND$)
Salary	2716494	2716494	2716494	2716494	2716494	2716494	2716494	2716494
Grinding Media and Maintenance Supplies	2527473	2378798	842491	792933	631868	594699	421245	396466
Power	6263736	5895281	2087912	1965094	1565934	1473820	1043956	982547
Flotation Reagent	7761025	7304494	2587008	2434831	1940256	1826124	1293504	1217416
Tails Disposal	1098901	1034260	366300	344753	274725	258565	183150	172377
Subtotal	20367629	19329327	8600206	8254105	7129278	6869703	5658350	5485300
Concentrate Transport								
Flotation Concentrate	10407983	10407983	7739269	7739269	6870216	6870216	5596381	5596381
Subtotal	10407983	10407983	7739269	7739269	6870216	6870216	5596381	5596381
Chemical & SX Plant Operating Cost								
Salary	3344969	3344969	3344969	3344969	3344969	3344969	3344969	3344969
Consumable	895853	895853	666147	666147	591345	591345	481701	481701
Chemicals	80220323	80220323	59651009	59651009	52952717	52952717	43134537	43134537
Subtotal	84461145	84461145	63662126	63662126	56889031	56889031	46961207	46961207
Fixed Cost								
G & A @ 4% of variable	4609470	4567938	3200064	3186220	2835541	2825158	2328638	2321716
Marketing @ 5% of variable	5761838	5709923	4000080	3982775	3544426	3531447	2910797	2902144
Camp Operation at $35/manday	166075	166075	166075	166075	166075	166075	166075	166075
Transportation Yellowknife↔Site @ 500 per one way trip	52000	52000	52000	52000	52000	52000	52000	52000
Plant Insurance	400000	400000	400000	400000	400000	400000	400000	400000
Freight of supplies @ 40 per tonne	171121	161055	57040	53685	42780	40264	28520	26842
Winter Road Yellowknife and Hay River to Site	300000	300000	300000	300000	300000	300000	300000	300000
Outside Travel	50000	50000	50000	50000	50000	50000	50000	50000
Head Office Cost	500000	500000	500000	500000	500000	500000	500000	500000
Subtotal	12010504	11906991	8725259	8690755	7890822	7864944	6736030	6718777
Over All Process Operating Cost	127247261	126105446	88726860	88346255	78779347	78493894	64951968	64761666
Cost per Tonne of Mill Feed	116	122	242	256	287	304	355	376
Cost per Tonne of TREO Produced	31812	31526	22182	22087	19695	19623	16238	16190
	Case 9	Case 10	Case 11	Case 12	Case 13	Case 14	Case 15	Case 16

Process Operating Costs, Cases 17-24

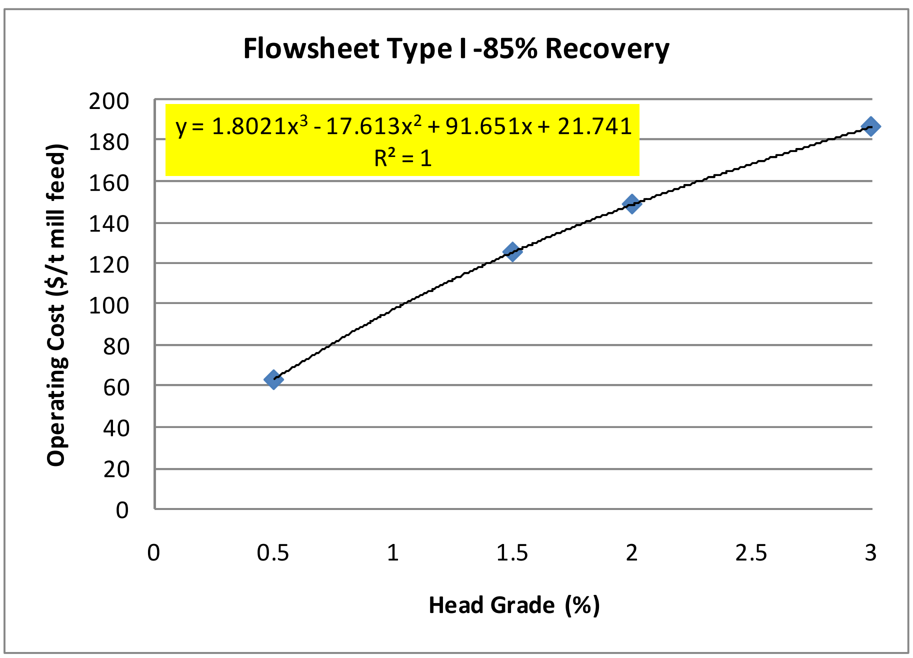
Annual Throughput (tonnes)	1098901	1034260	366300	344753	274725	258565	183150	172377
Concentrate Tonnes	101048	101048	75139	75139	66701	66701	54334	54334
Flotation Plant Operating Cost	Case 17	Case 18	Case 19	Case 20	Case 21	Case 22	Case 23	Case 24
Variable	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost
	(CND$)	(CND$)	(CND$)	(CND$)	(CND$)	(CND$)	(CND$)	(CND$)
Salary	2716494	2716494	2716494	2716494	2716494	2716494	2716494	2716494
Grinding Media and Maintenance Supplies	2527473	2378798	842491	792933	631868	594699	421245	396466
Power	6263736	5895281	2087912	1965094	1565934	1473820	1043956	982547
Flotation Reagent	7761025	7304494	2587008	2434831	1940256	1826124	1293504	1217416
Tails Disposal	1098901	1034260	366300	344753	274725	258565	183150	172377
Subtotal	20367629	19329327	8600206	8254105	7129278	6869703	5658350	5485300
Concentrate Transport								
Flotation Concentrate	10407983	10407983	7739269	7739269	6870216	6870216	5596381	5596381
Subtotal	10407983	10407983	7739269	7739269	6870216	6870216	5596381	5596381
Chemical & SX Plant Operating Cost								
Salary	3344969	3344969	3344969	3344969	3344969	3344969	3344969	3344969
Consumable	895853	895853	666147	666147	591345	591345	481701	481701
Chemicals	48580335	48580335	36123839	36123839	32067444	32067444	26121688	26121688
Subtotal	52821158	52821158	40134956	40134956	36003758	36003758	29948359	29948359
Fixed Cost								
G & A @ 4% of variable	3343871	3302339	2258977	2245133	2000130	1989747	1648124	1641202
Marketing @ 5% of variable	4179839	4127923	2823722	2806417	2500163	2487184	2060155	2051502
Camp Operation at $35/manday	166075	166075	166075	166075	166075	166075	166075	166075
Transportation Yellowknife↔Site @ 500 per one way trip	52000	52000	52000	52000	52000	52000	52000	52000
Plant Insurance	400000	400000	400000	400000	400000	400000	400000	400000
Freight of supplies @ 40 per tonne	171121	161055	57040	53685	42780	40264	28520	26842
Winter Road Yellowknife and Hay River to Site	300000	300000	300000	300000	300000	300000	300000	300000
Outside Travel	50000	50000	50000	50000	50000	50000	50000	50000
Head Office Cost	500000	500000	500000	500000	500000	500000	500000	500000
Subtotal	9162905	9059392	6607814	6573310	6011148	5985270	5204873	5187621
Over All Process Operating Cost	92759675	91617860	63082245	62701640	56014401	55728947	46407963	46217661
Cost per Tonne of Mill Feed	84	89	172	182	204	216	253	268
Cost per Tonne of TREO Produced	23190	22904	15771	15675	14004	13932	11602	11554
	Case 17	Case 18	Case 19	Case 20	Case 21	Case 22	Case 23	Case 24

Process Operating Costs, Cases 25 to 32

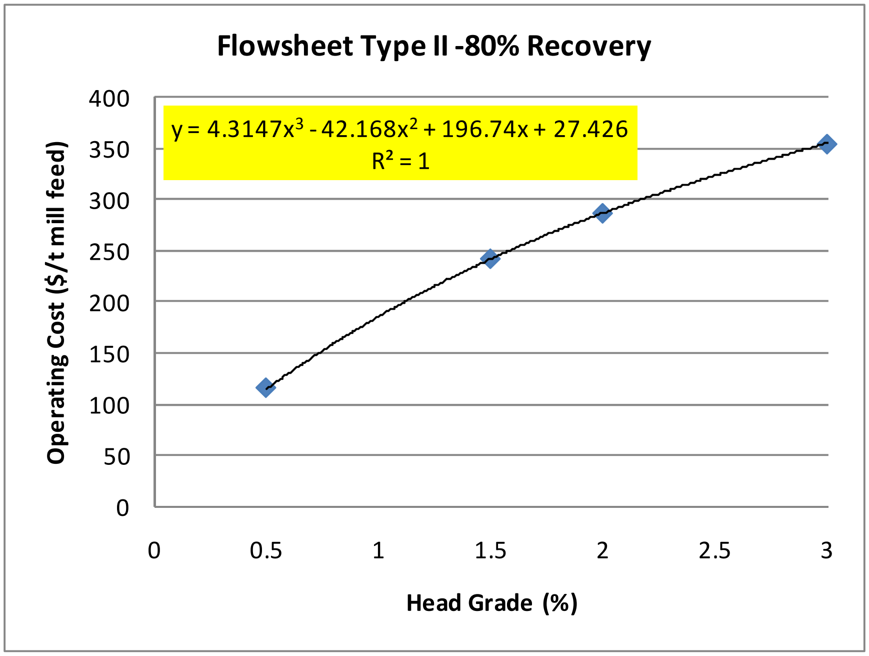
Annual Throughput (tonnes)	1098901	1034260	366300	344753	274725	258565	183150	172377
Concentrate Tonnes	101048	101048	75139	75139	66701	66701	54334	54334
Flotation Plant Operating Cost	Case 25	Case 26	Case 27	Case 28	Case 29	Case 30	Case 31	Case 32
Variable	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost
	(CND$)	(CND$)	(CND$)	(CND$)	(CND$)	(CND$)	(CND$)	(CND$)
Salary	2716494	2716494	2716494	2716494	2716494	2716494	2716494	2716494
Grinding Media and Maintenance Supplies	2527473	2378798	842491	792933	631868	594699	421245	396466
Power	6263736	5895281	2087912	1965094	1565934	1473820	1043956	982547
Flotation Reagent	7761025	7304494	2587008	2434831	1940256	1826124	1293504	1217416
Tails Disposal	1098901	1034260	366300	344753	274725	258565	183150	172377
Subtotal	20367629	19329327	8600206	8254105	7129278	6869703	5658350	5485300
Concentrate Transport								
Flotation Concentrate	10407983	10407983	7739269	7739269	6870216	6870216	5596381	5596381
Subtotal	10407983	10407983	7739269	7739269	6870216	6870216	5596381	5596381
Chemical & SX Plant Operating Cost								
Salary	3344969	3344969	3344969	3344969	3344969	3344969	3344969	3344969
Consumable	895853	895853	666147	666147	591345	591345	481701	481701
Chemicals	49566343	49566343	36857024	36857024	32718299	32718299	26651866	26651866
Subtotal	53807165	53807165	40868141	40868141	36654613	36654613	30478536	30478536
Fixed Cost								
G & A @ 4% of variable	3383311	3341779	2288305	2274461	2026164	2015781	1669331	1662409
Marketing @ 5% of variable	4229139	4177224	2860381	2843076	2532705	2519727	2086663	2078011
Camp Operation at $35/manday	166075	166075	166075	166075	166075	166075	166075	166075
Transportation Yellowknife↔Site @ 500 per one way trip	52000	52000	52000	52000	52000	52000	52000	52000
Plant Insurance	400000	400000	400000	400000	400000	400000	400000	400000
Freight of supplies @ 40 per tonne	171121	161055	57040	53685	42780	40264	28520	26842
Winter Road Yellowknife and Hay River to Site	300000	300000	300000	300000	300000	300000	300000	300000
Outside Travel	50000	50000	50000	50000	50000	50000	50000	50000
Head Office Cost	500000	500000	500000	500000	500000	500000	500000	500000
Subtotal	9251646	9148133	6673801	6639296	6069725	6043847	5252589	5235337
Over All Process Operating Cost	93834423	92692608	63881417	63500812	56723832	56438379	46985856	46795554
Cost per Tonne of Mill Feed	85	90	174	184	206	218	257	271
Cost per Tonne of TREO Produced	23459	23173	15970	15875	14181	14110	11746	11699
	Case 25	Case 26	Case 27	Case 28	Case 29	Case 30	Case 31	Case 32



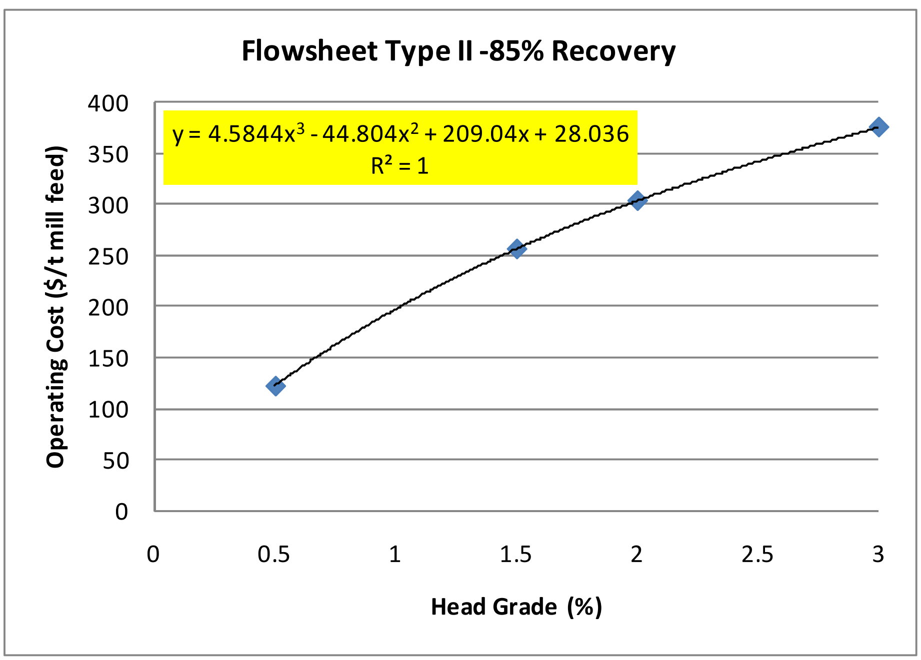
Process Operating Costs vs. Feed Head Grade – Flow Sheet Option Type I at 80% Flotation Recovery



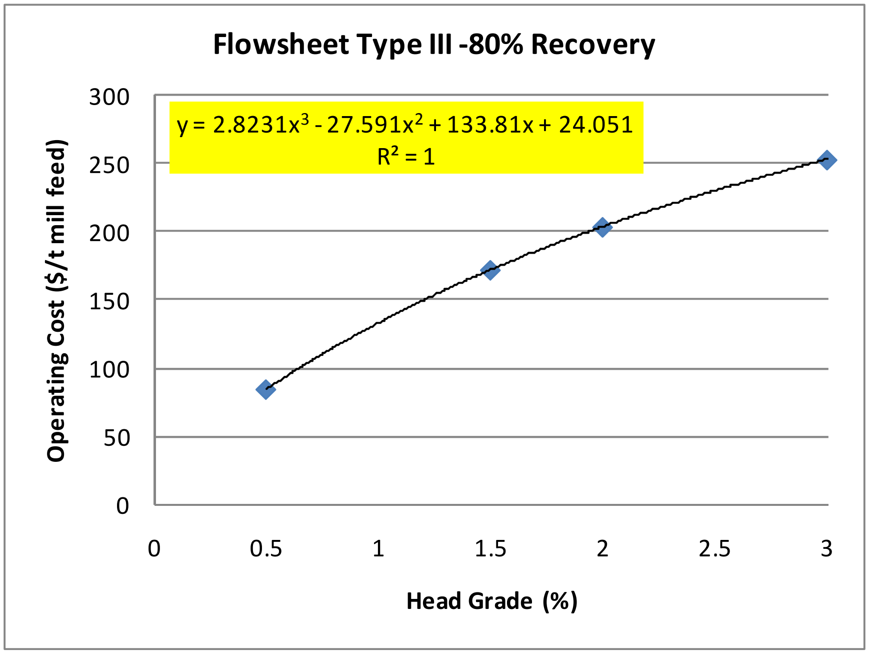
Process Operating Costs vs. Feed Head Grade – Flow Sheet Option Type I at 85% Flotation Recovery



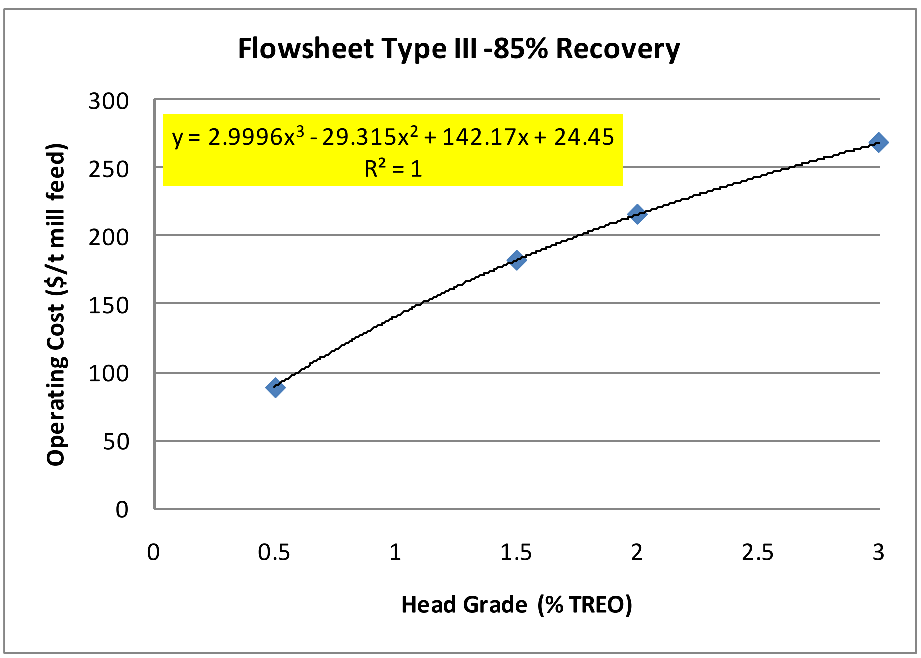
Process Operating Costs vs. Feed Head Grade – Flow Sheet Option Type II at 80% Flotation Recovery



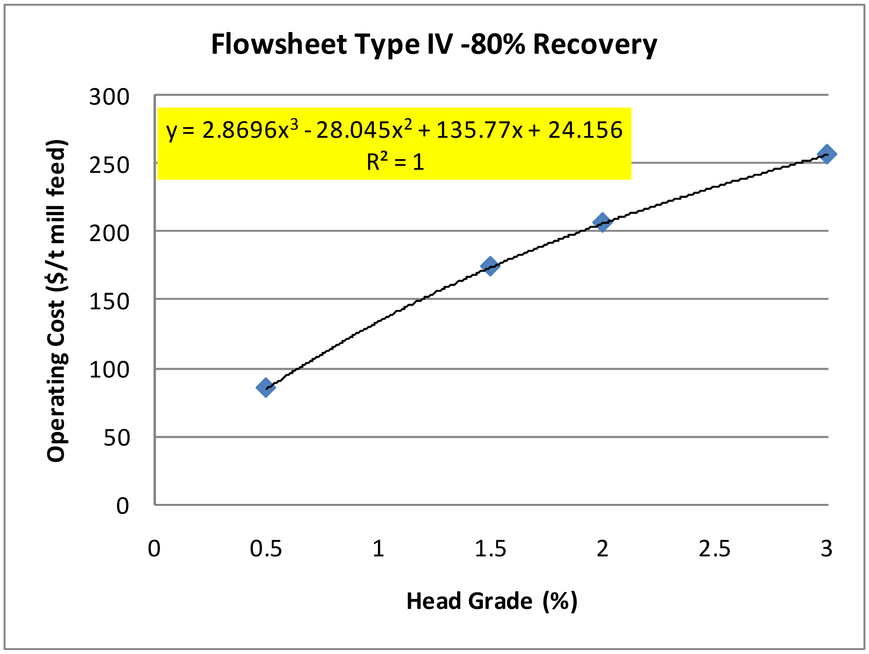
Process Operating Costs vs. Feed Head Grade – Flow Sheet Option Type II at 85% Flotation Recovery



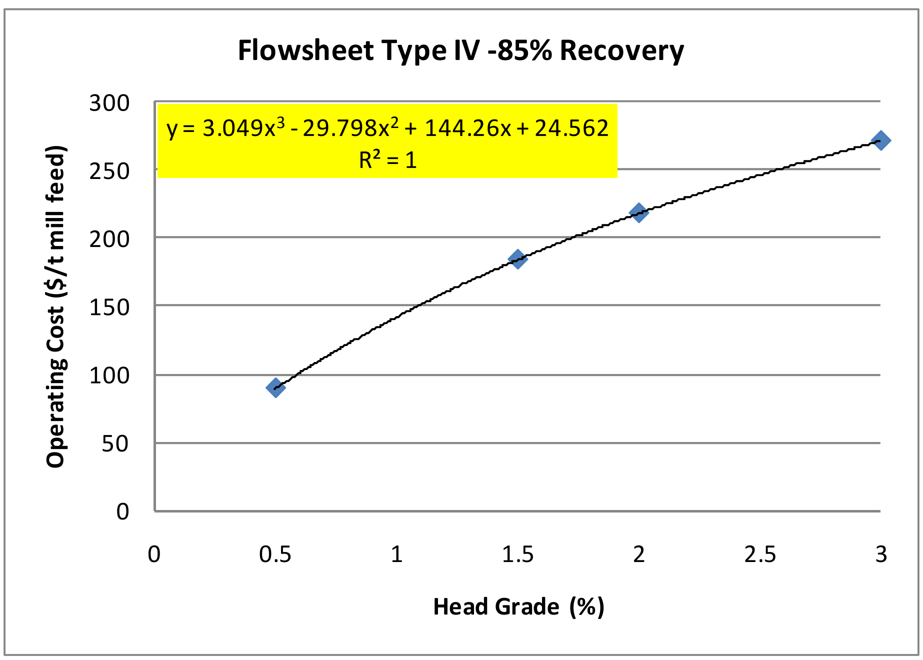
Process Operating Costs vs. Feed Head Grade – Flow Sheet Option Type III at 80% Flotation Recovery



Process Operating Costs vs. Feed Head Grade – Flow Sheet Option Type III at 85% Flotation Recovery



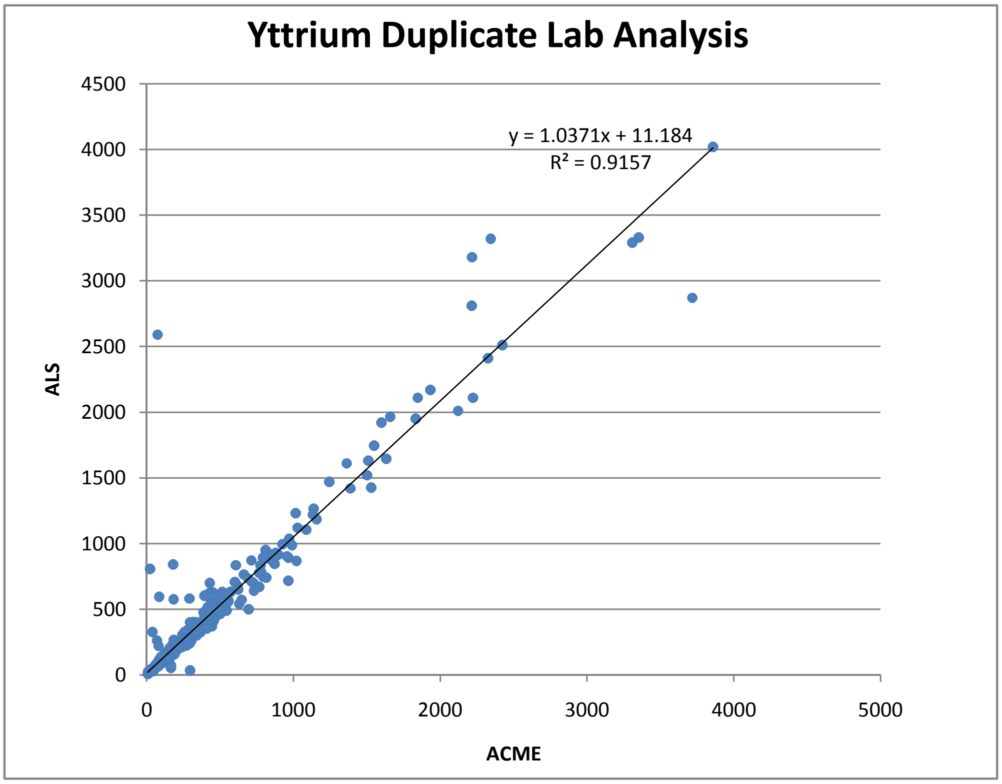
Process Operating Costs vs. Feed Head Grade – Flow Sheet Option Type IV at 80% Flotation Recovery



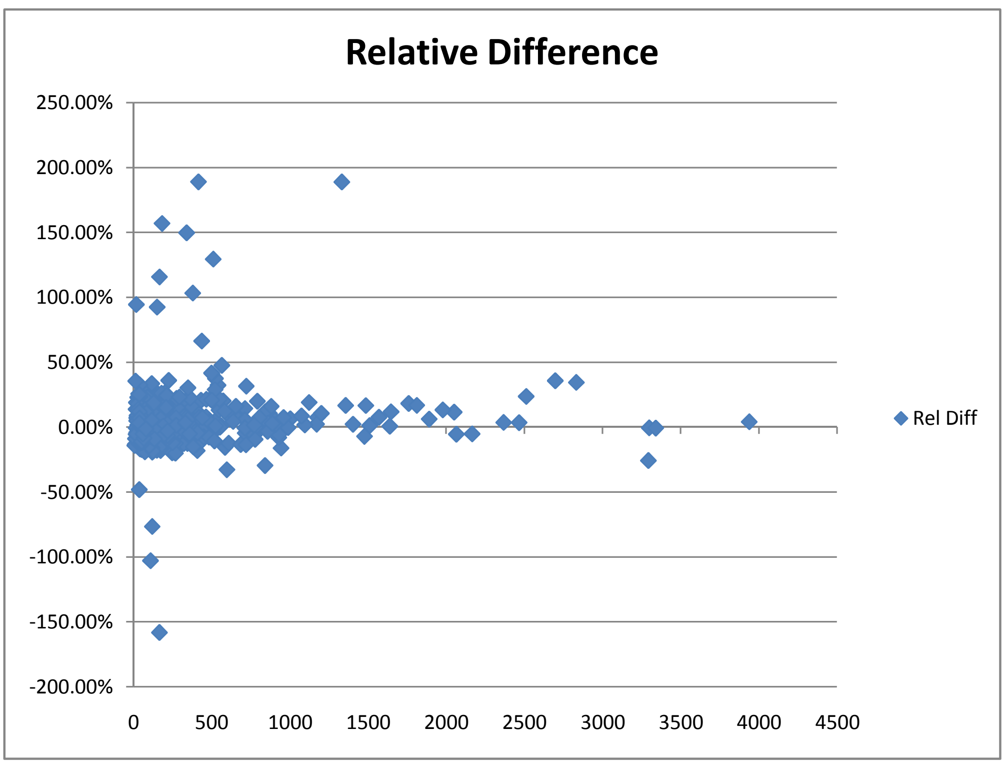
Process Operating Costs vs. Feed Head Grade – Flow Sheet Option Type IV at 85% Flotation Recovery

APPENDIX H

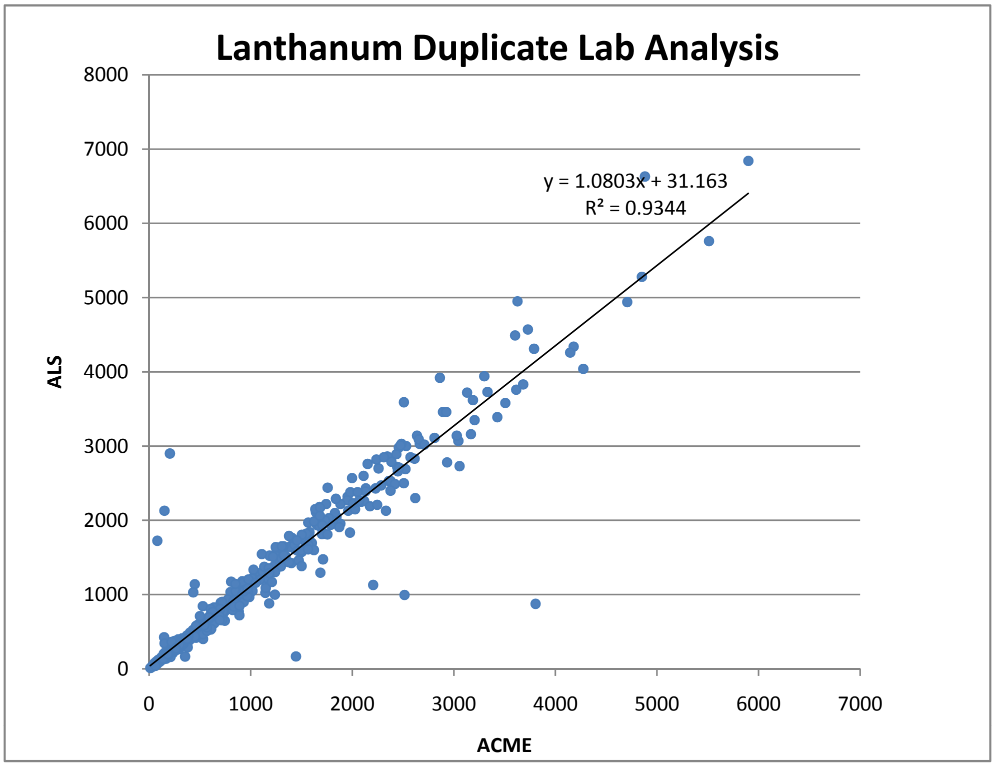
DUPLICATE LAB ANALYSIS

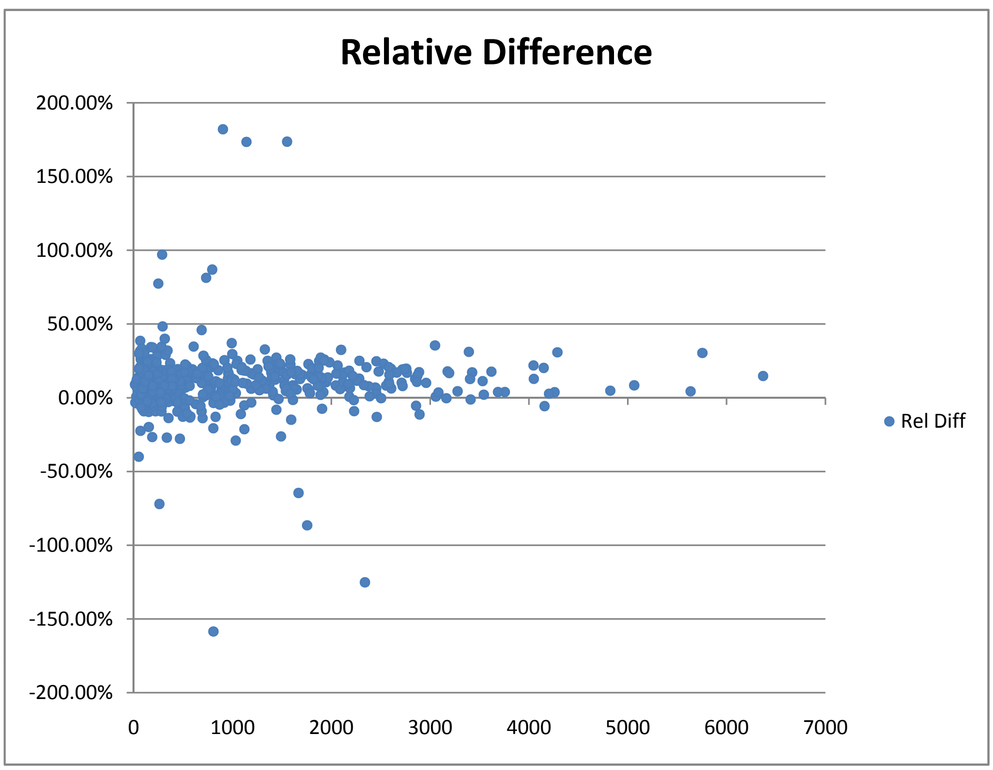


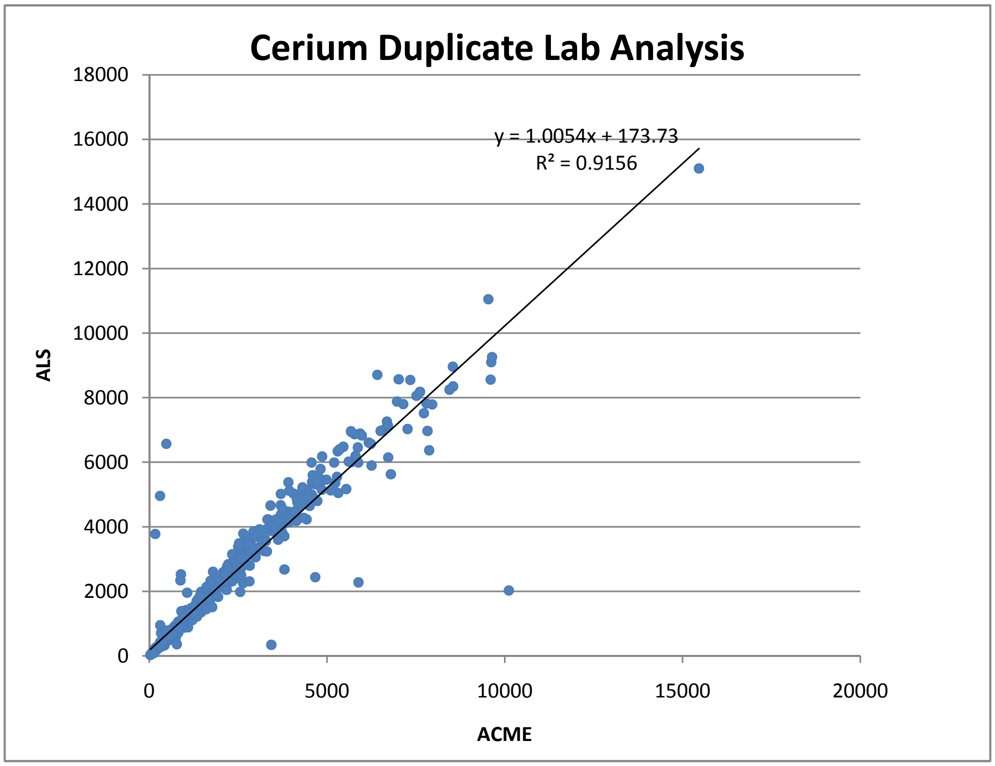
Yttrium Duplicate Lab Analysis
y = 1.0371x + 11.184
R² = 0.9157
ALS
ACME
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000

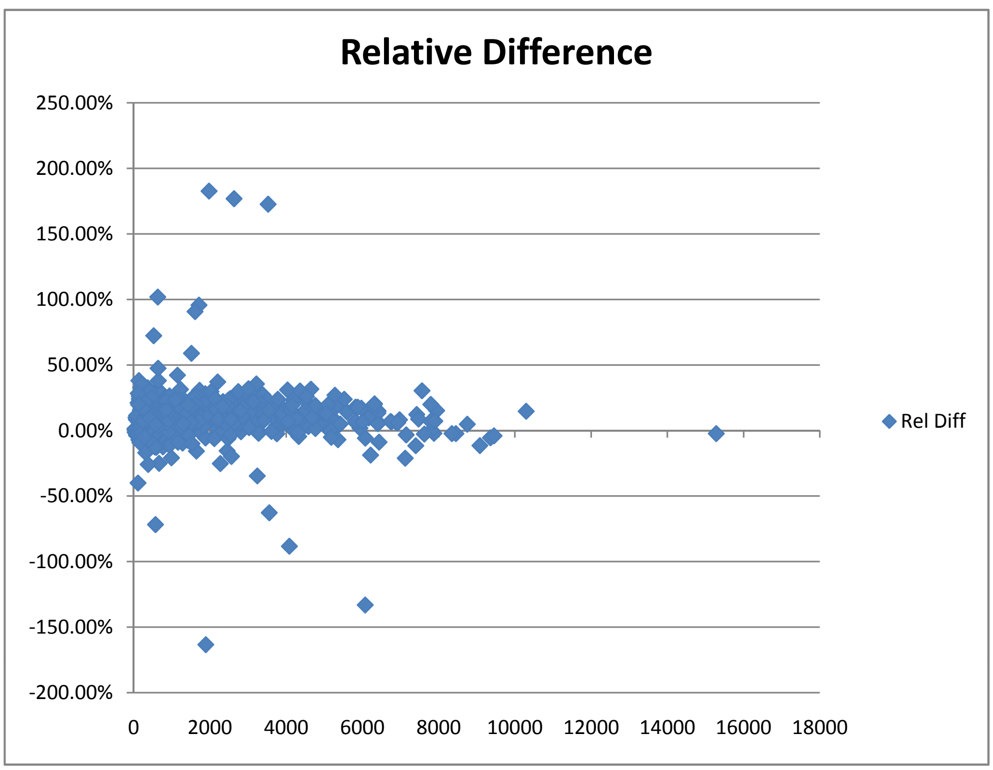


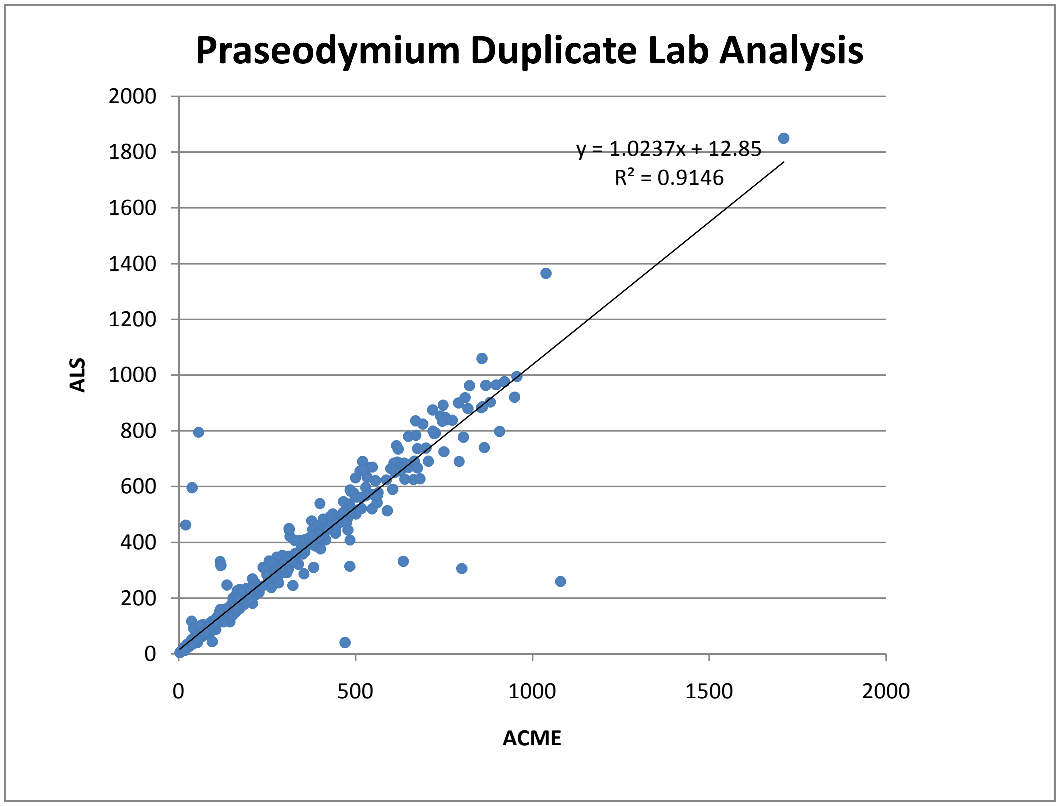
Relative Difference
250.00%
200.00%
150.00%
100.00%
50.00%
0.00%
-50.00%
-100.00%
-150.00%
-200.00%
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Rel Diff

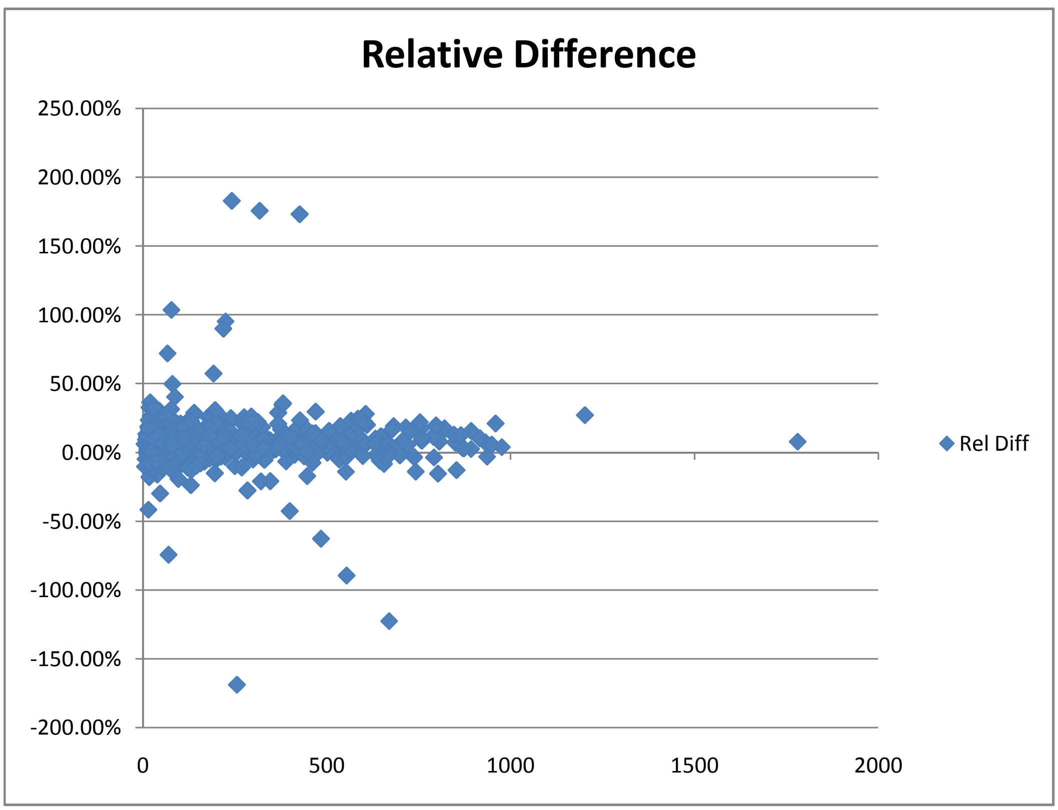

Lanthanum Duplicate Lab Analysis
y = 1.0803x + 31.163
R² = 0.9344
ALS
ACME
0
1000
2000
3000
4000
5000
6000
7000
8000

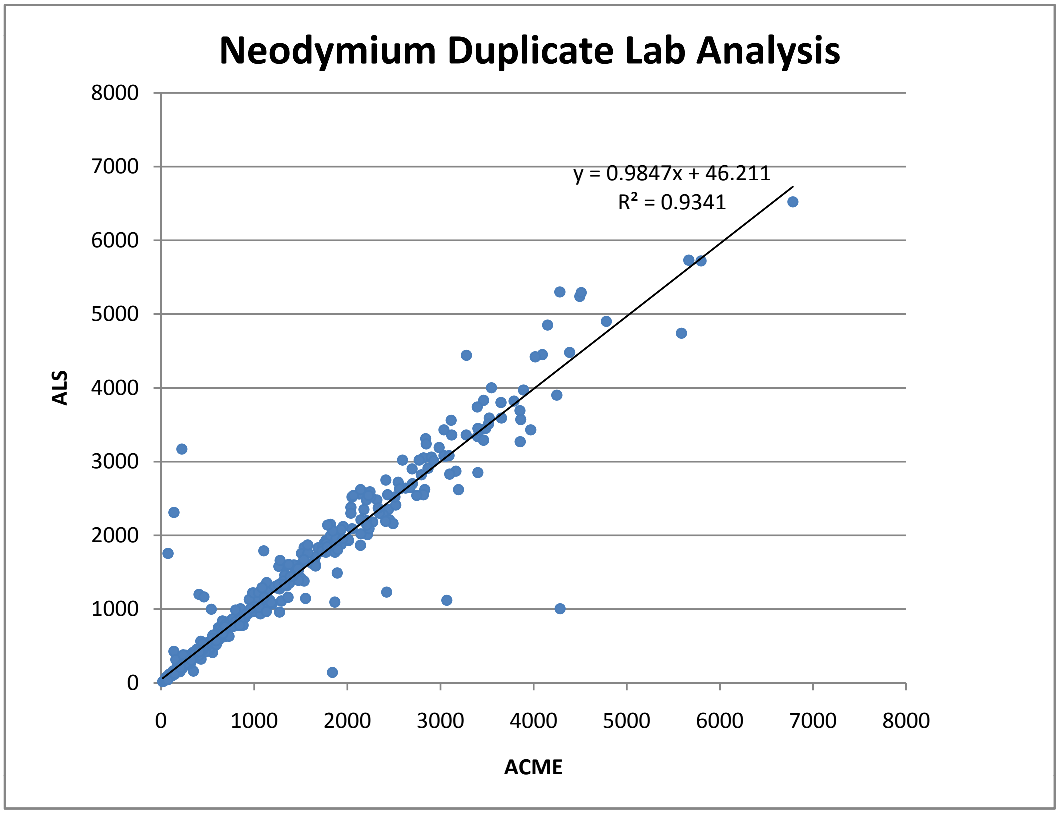

Relative Difference
200.00%
150.00%
100.00%
50.00%
0.00%
-50.00%
-100.00%
-150.00%
-200.00%
0
1000
2000
3000
4000
5000
6000
7000
Rel Diff

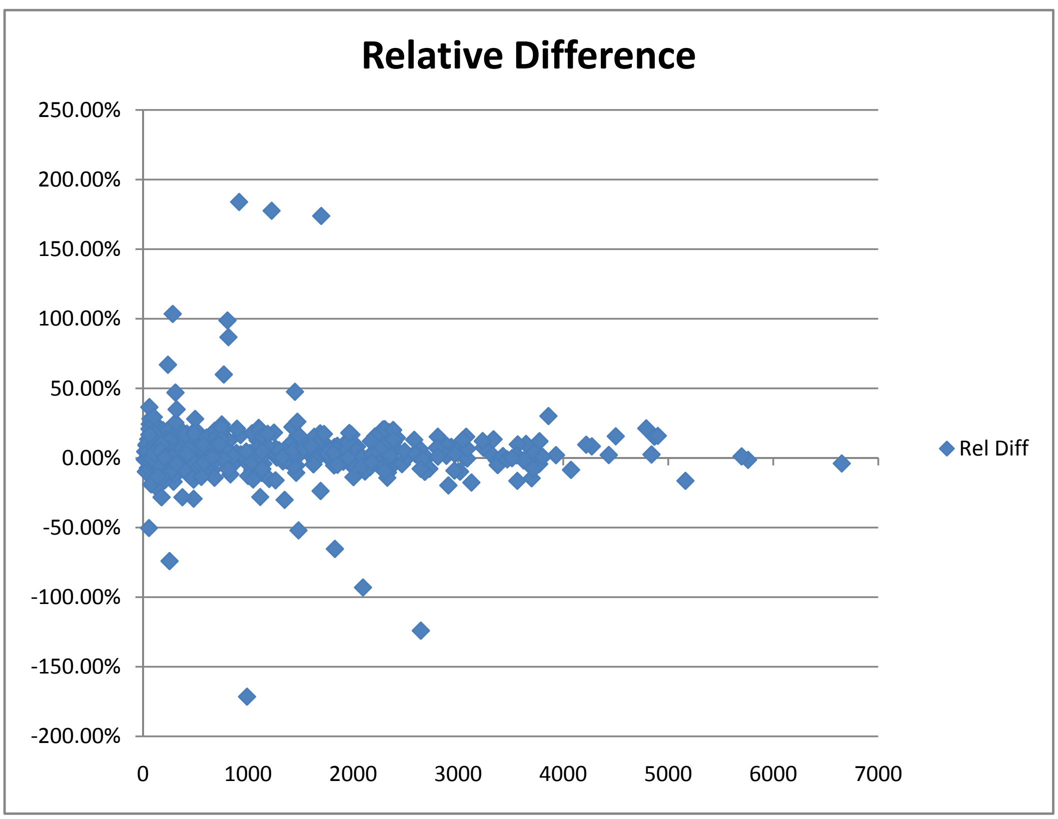

Cerium Duplicate Lab Analysis
y = 1.0054x + 173.73
R² = 0.9156
ALS
ACME
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
0
5000
10000
15000
20000

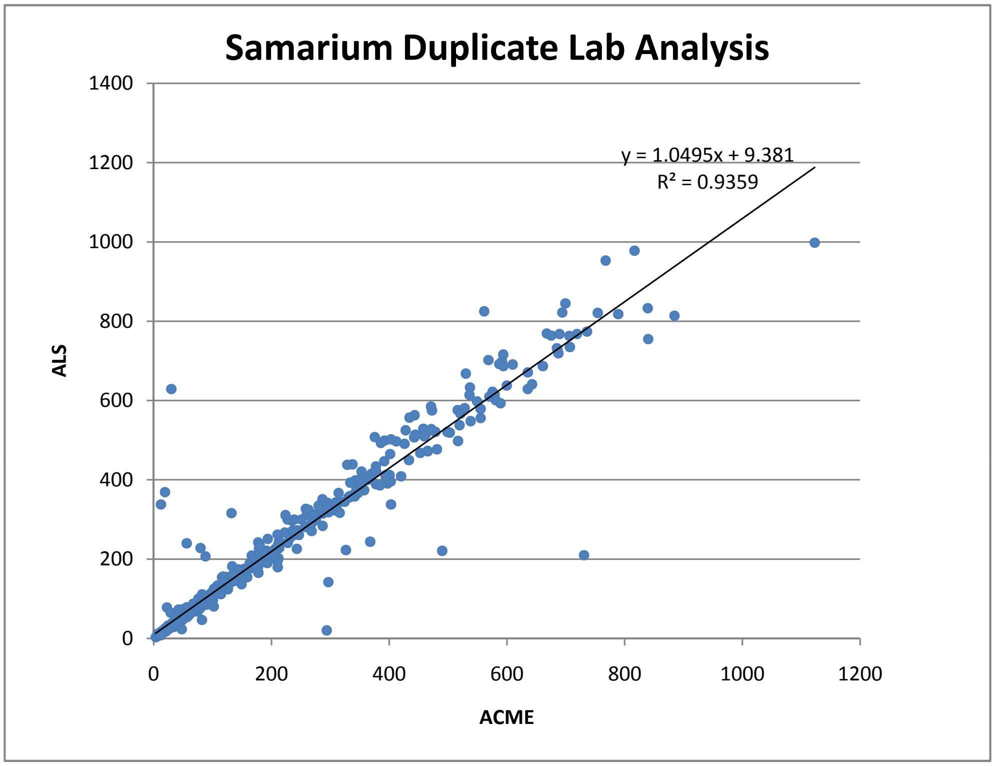

Relative Difference
Rel Diff
250.00%
200.00%
150.00%
100.00%
50.00%
0.00%
-50.00%
-100.00%
-150.00%
-200.00%
0
2000
4000
6000
8000
10000
12000
14000
16000
18000


Praseodymium Duplicate Lab Analysis
y = 1.0237x + 12.85
R² = 0.9146
ALS
ACME
0
200
400
600
800
1000
1200
1400
1600
1800
2000
0
500
1000
1500
2000

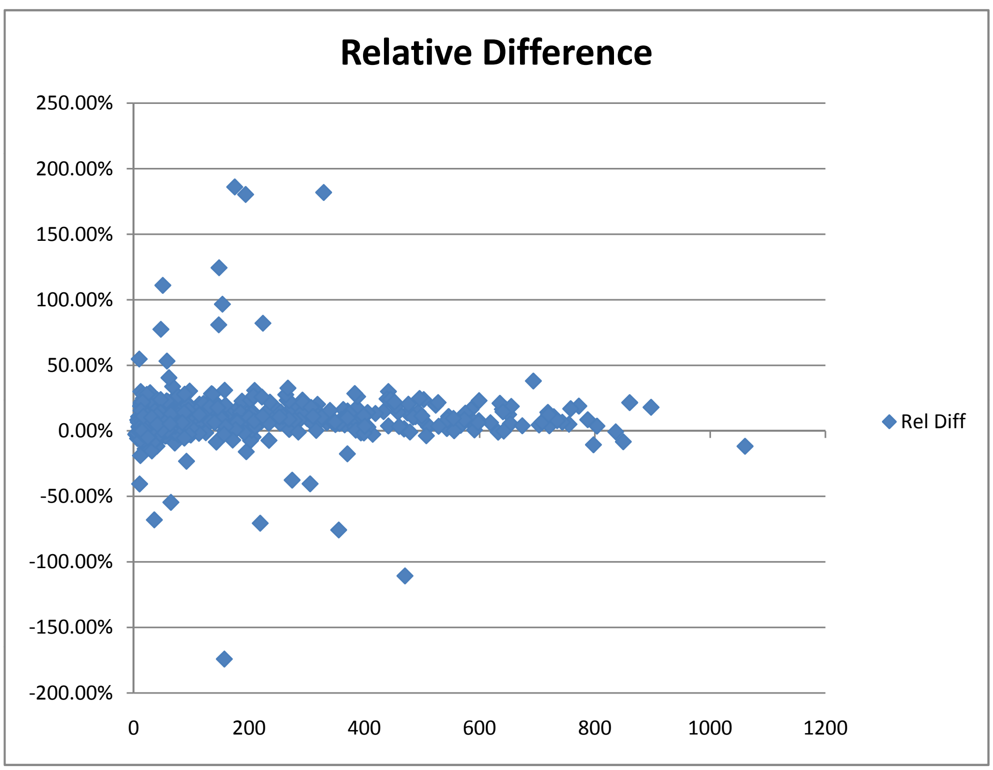

Relative Difference
250.00%
200.00%
150.00%
100.00%
50.00%
0.00%
-50.00%
-100.00%
-150.00%
-200.00%
0
500
1000
1500
2000
Rel Diff


Neodymium Duplicate Lab Analysis
y = 0.9847x + 46.211
R² = 0.9341
ALS
ACME
0
1000
2000
3000
4000
5000
6000
7000
8000

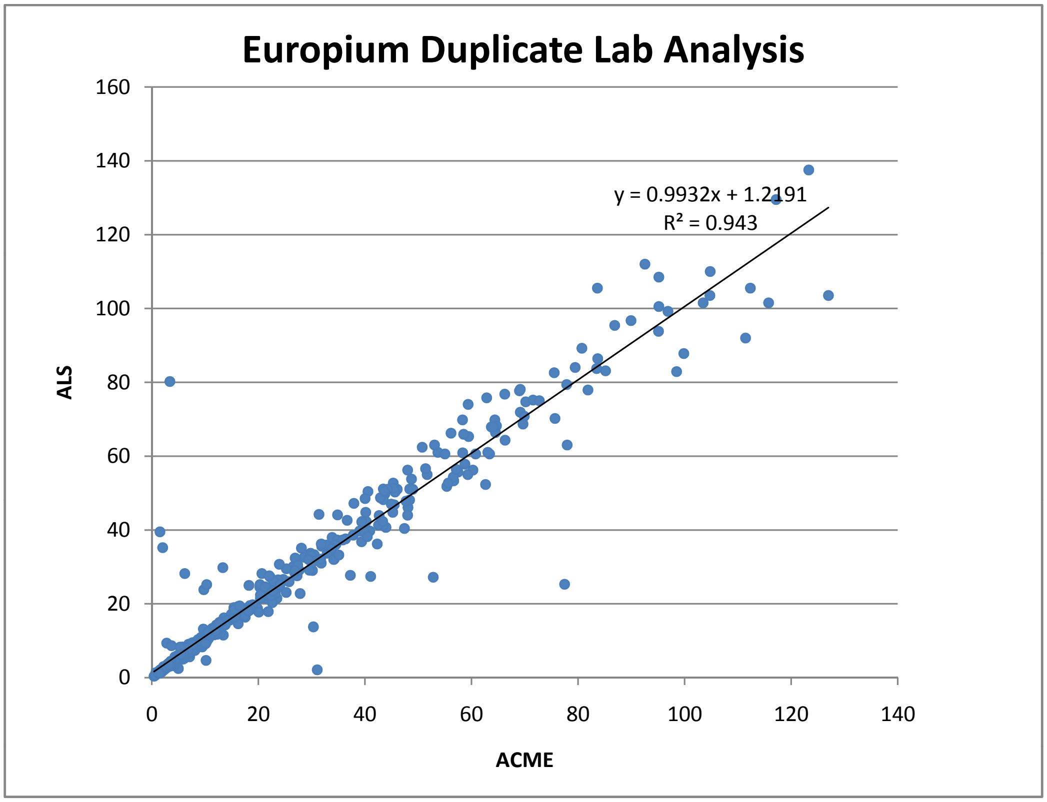

Relative Difference
250.00%
200.00%
150.00%
100.00%
50.00%
0.00%
-50.00%
-100.00%
-150.00%
-200.00%
0
1000
2000
3000
4000
5000
6000
7000
Rel Diff



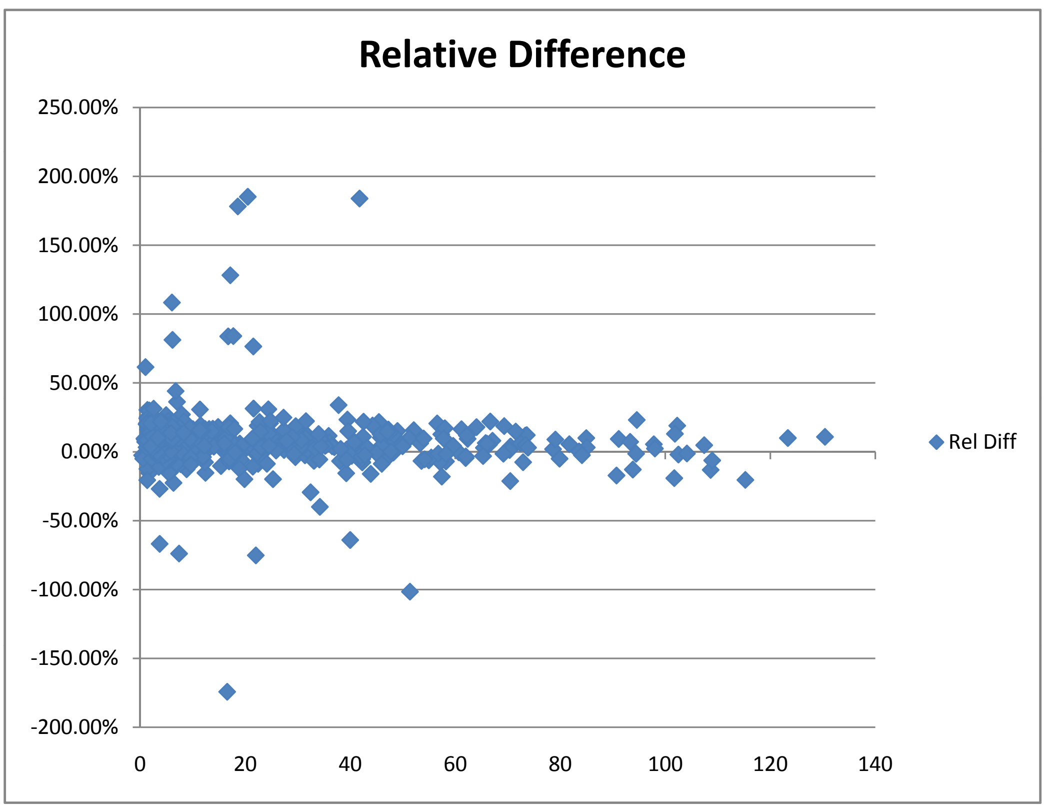
Samarium Duplicate Lab Analysis
y = 1.0495x + 9.381
R² = 0.9359
ALS
ACME
1400
1200
1000
800
600
400
200
0
0
200
400
600
800
1000
1200



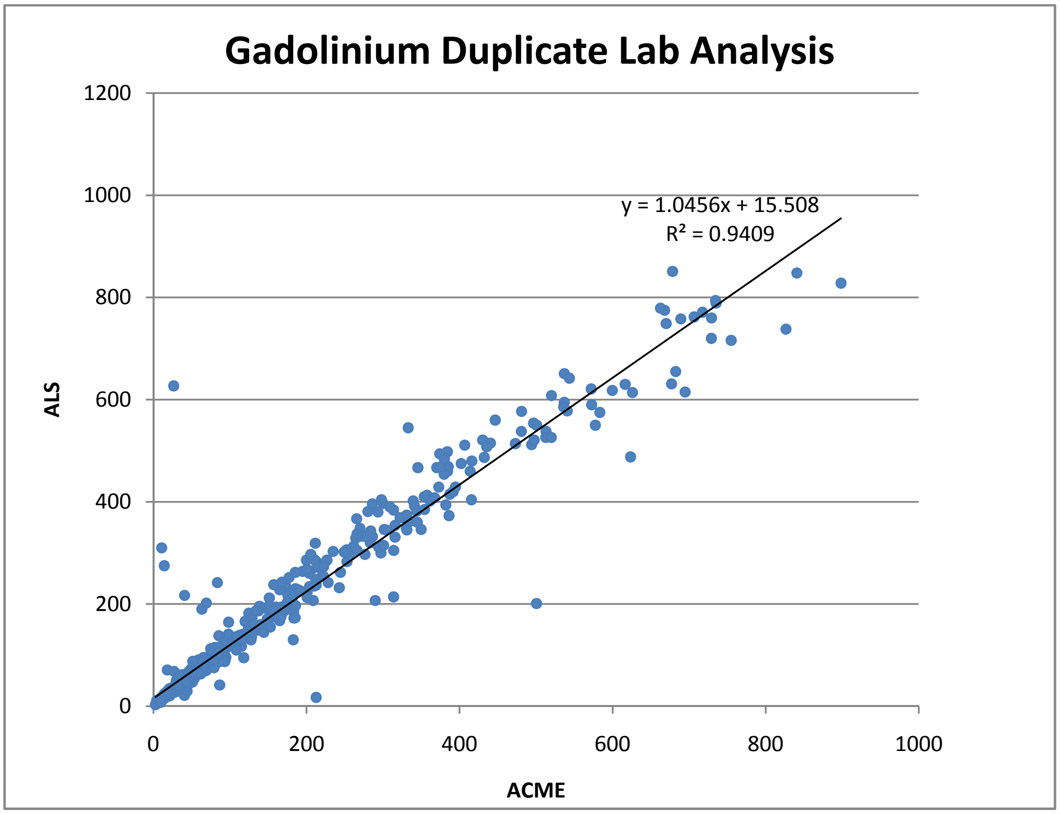
Relative Difference
250.00%
200.00%
150.00%
100.00%
50.00%
0.00%
-50.00%
-100.00%
-150.00%
-200.00%
0
200
400
600
800
1000
1200
Rel Diff



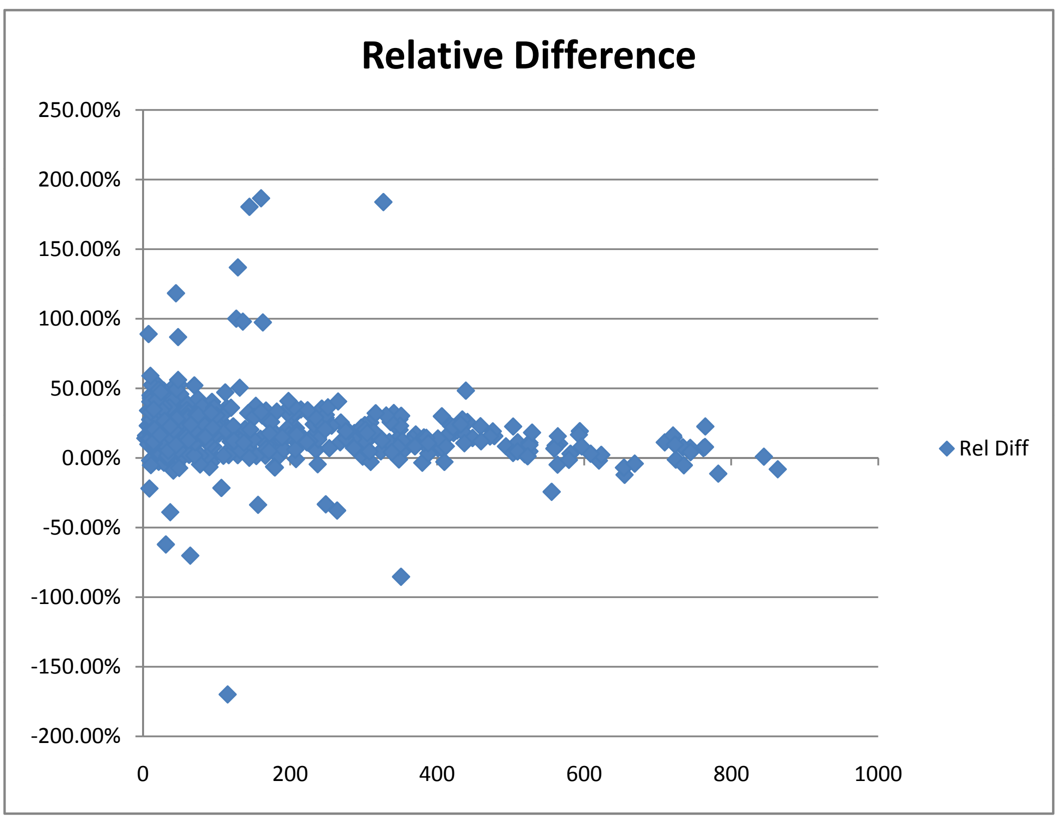
Europium Duplicate Lab Analysis
y = 0.9932x + 1.2191
R² = 0.943
ALS
ACME
0
20
40
60
80
100
120
140
160



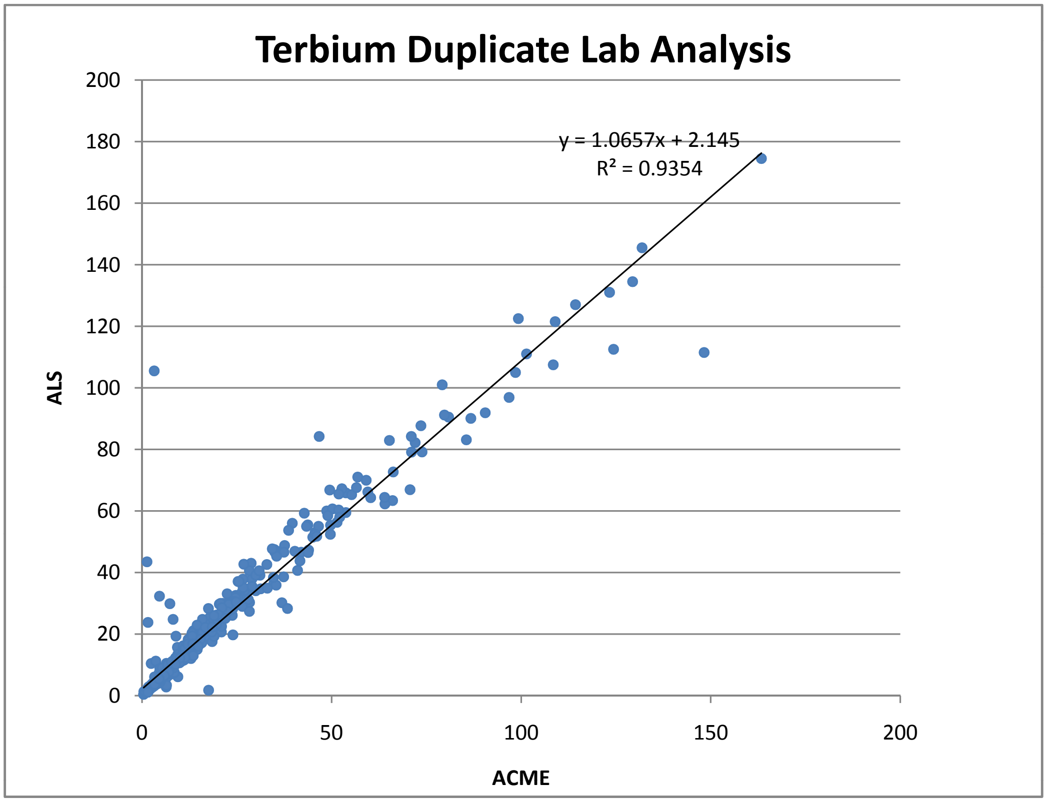
Relative Difference
250.00%
200.00%
150.00%
100.00%
50.00%
0.00%
-50.00%
-100.00%
-150.00%
-200.00%
0
20
40
60
80
100
120
140
Rel Diff

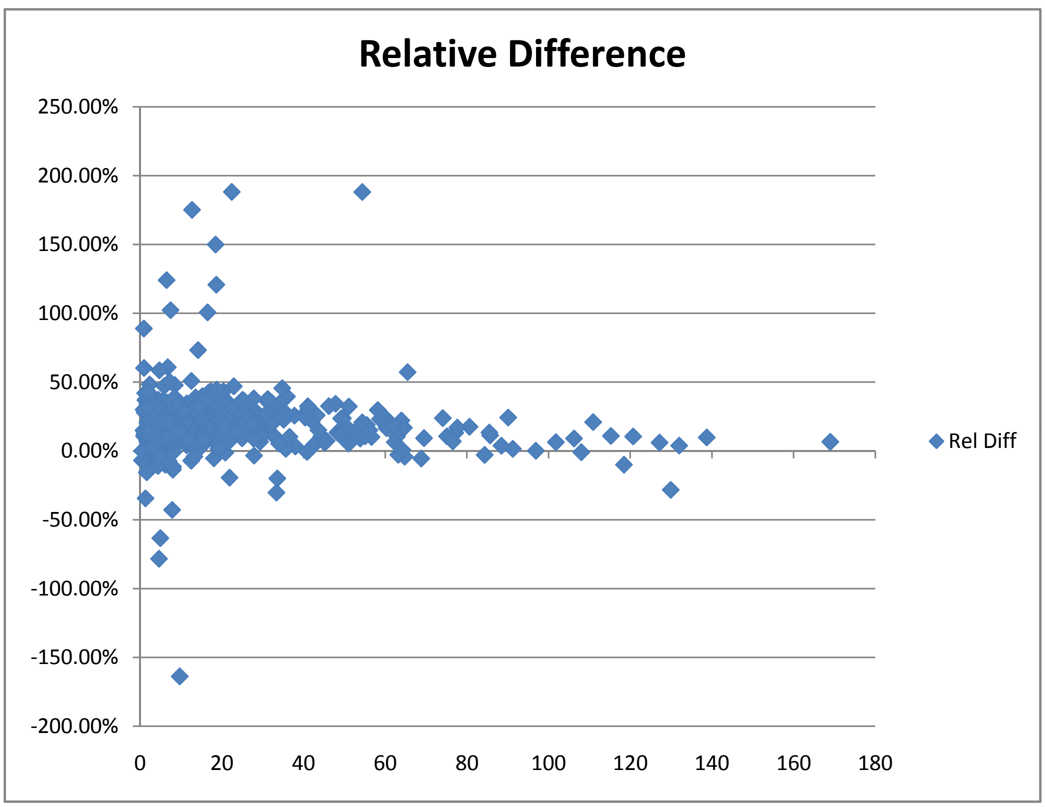


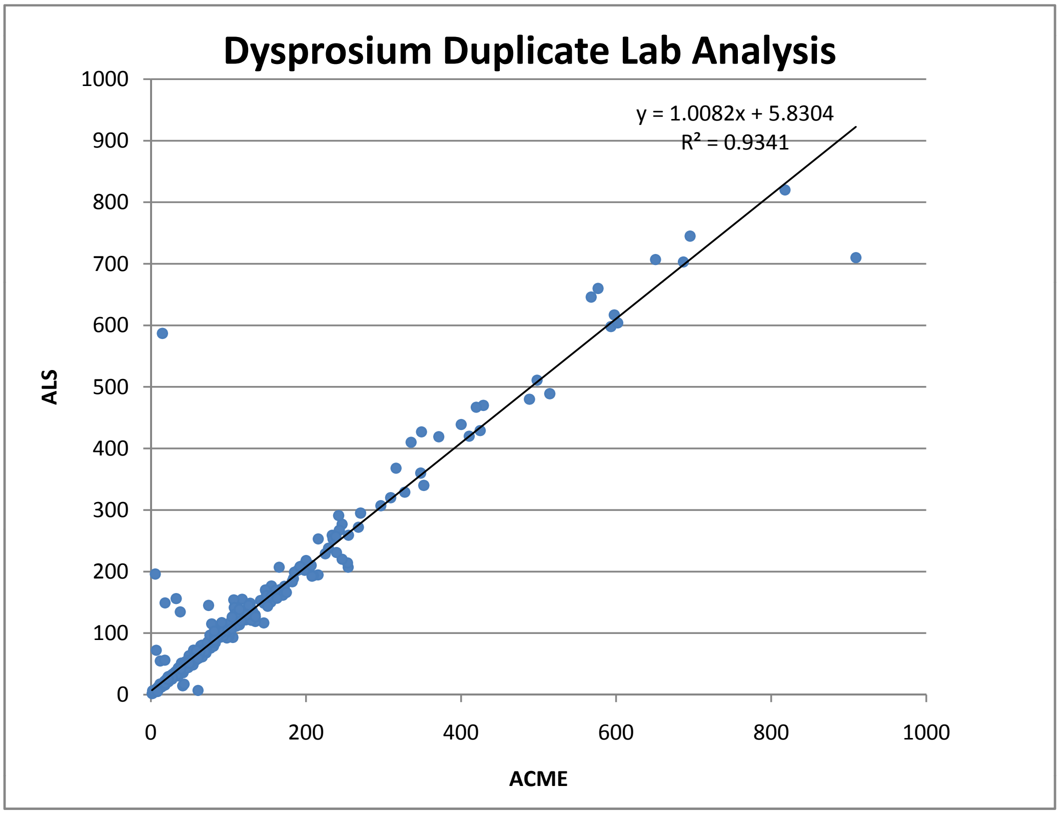
Gadolinium Duplicate Lab Analysis
y = 1.0456x + 15.508
R² = 0.9409
ALS
ACME
0
200
400
600
800
1000
1200

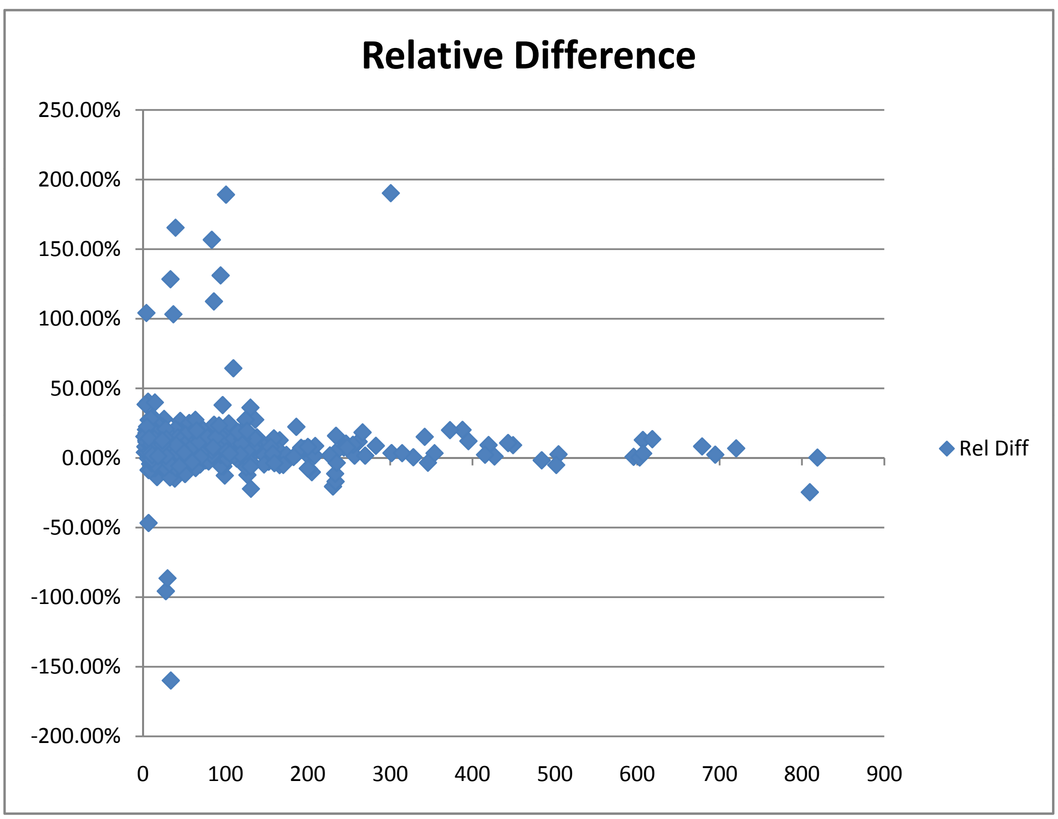


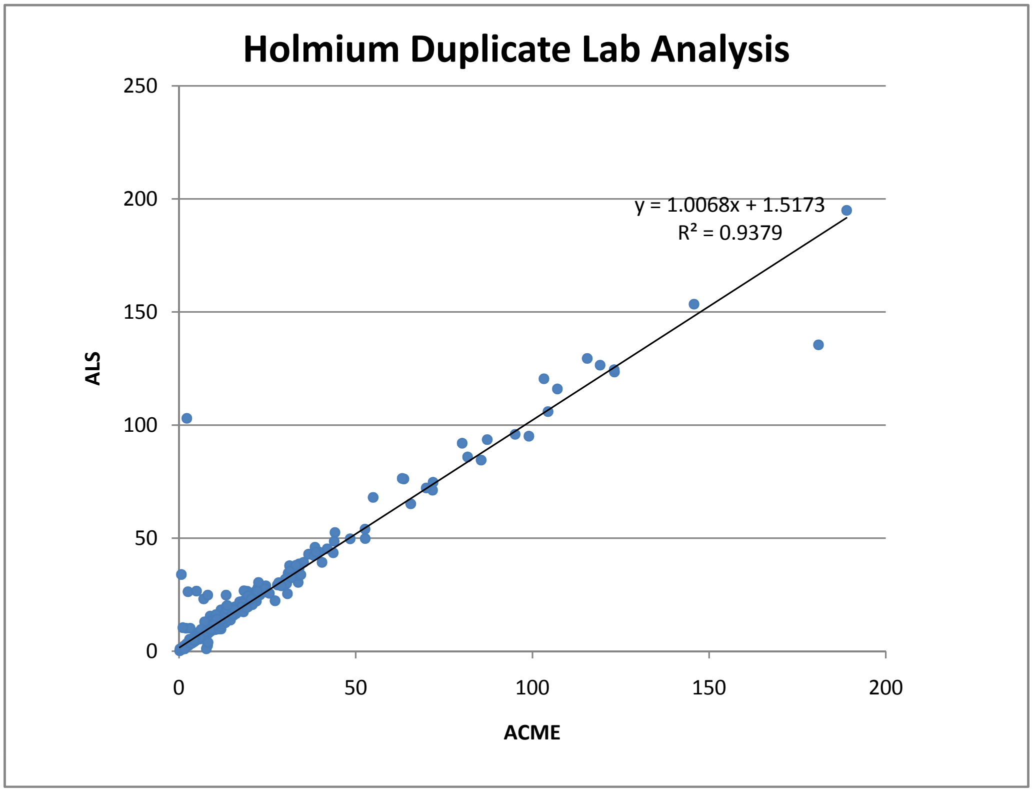
Relative Difference
250.00%
200.00%
150.00%
100.00%
50.00%
0.00%
-50.00%
-100.00%
-150.00%
-200.00%
0
200
400
600
800
1000
Rel Diff


Terbium Duplicate Lab Analysis
y = 1.0657x + 2.145
R² = 0.9354
ALS
ACME
0
20
40
60
80
100
120
140
160
180
200
0
50
100
150
200

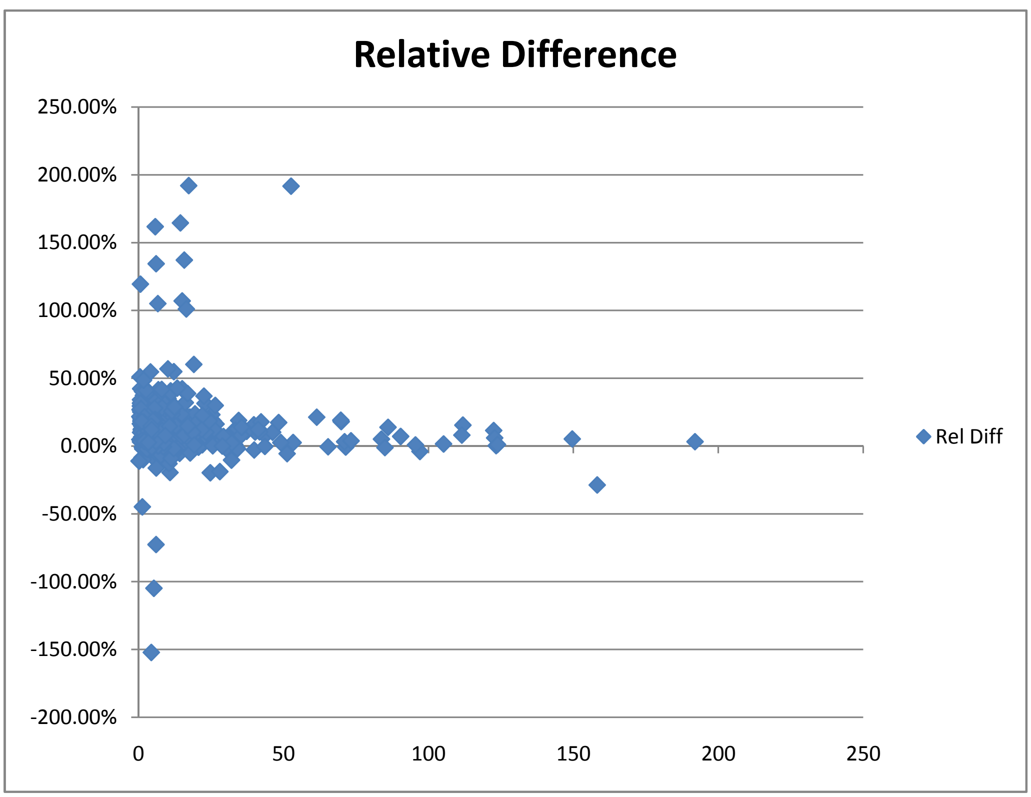

Relative Difference
250.00%
200.00%
150.00%
100.00%
50.00%
0.00%
-50.00%
-100.00%
-150.00%
-200.00%
0
20
40
60
80
100
120
140
160
180
Rel Diff


Dysprosium Duplicate Lab Analysis
y = 1.0082x + 5.8304
R² = 0.9341
ALS
ACME
0
100
200
300
400
500
600
700
800
900
1000

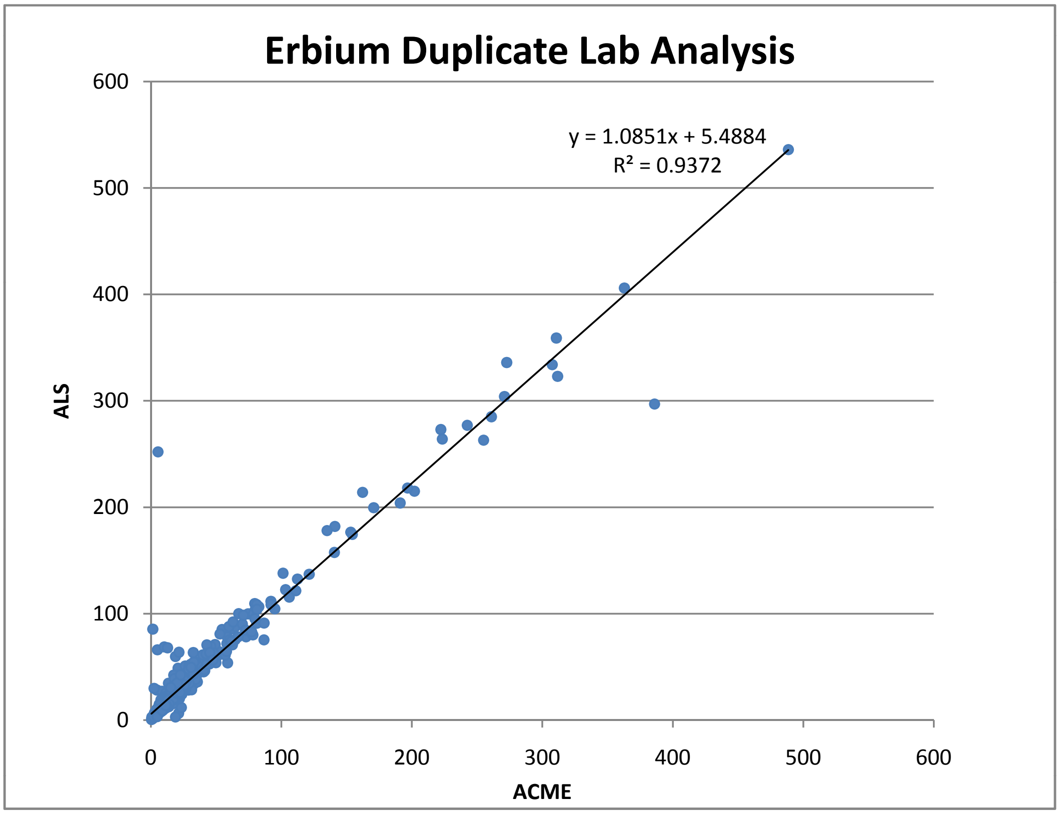

Relative Difference
250.00%
200.00%
150.00%
100.00%
50.00%
0.00%
-50.00%
-100.00%
-150.00%
-200.00%
0
100
200
300
400
500
600
700
800
900
Rel Diff

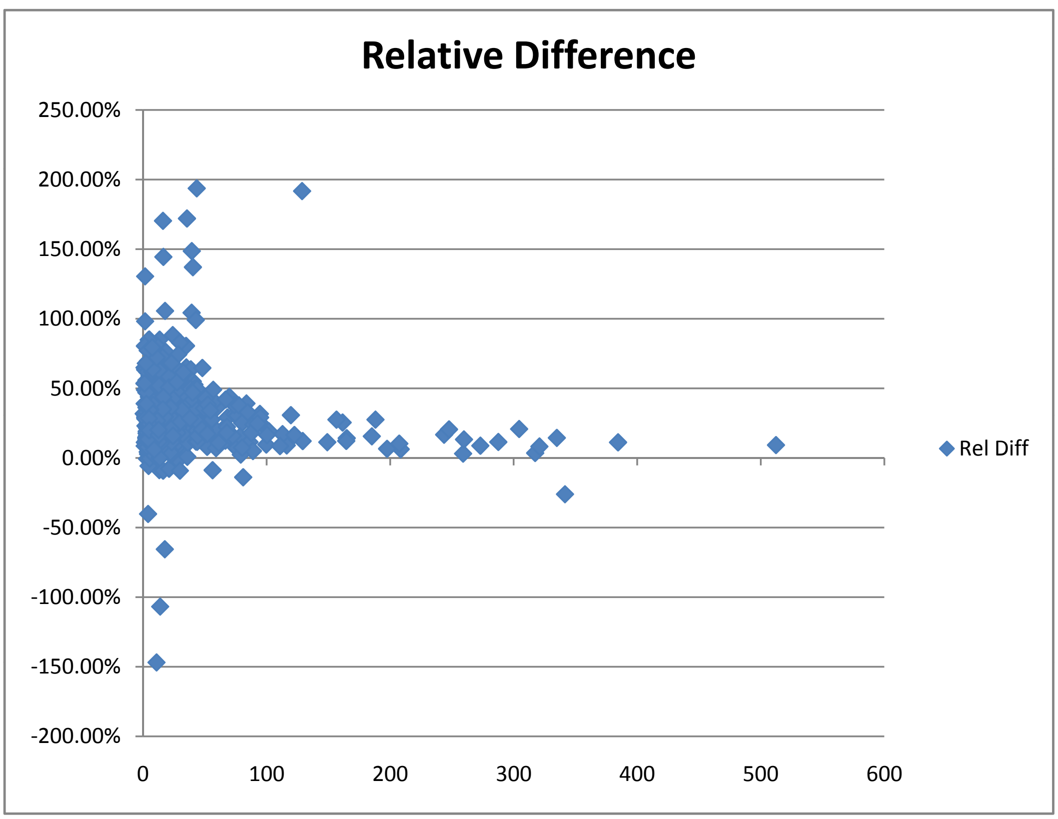


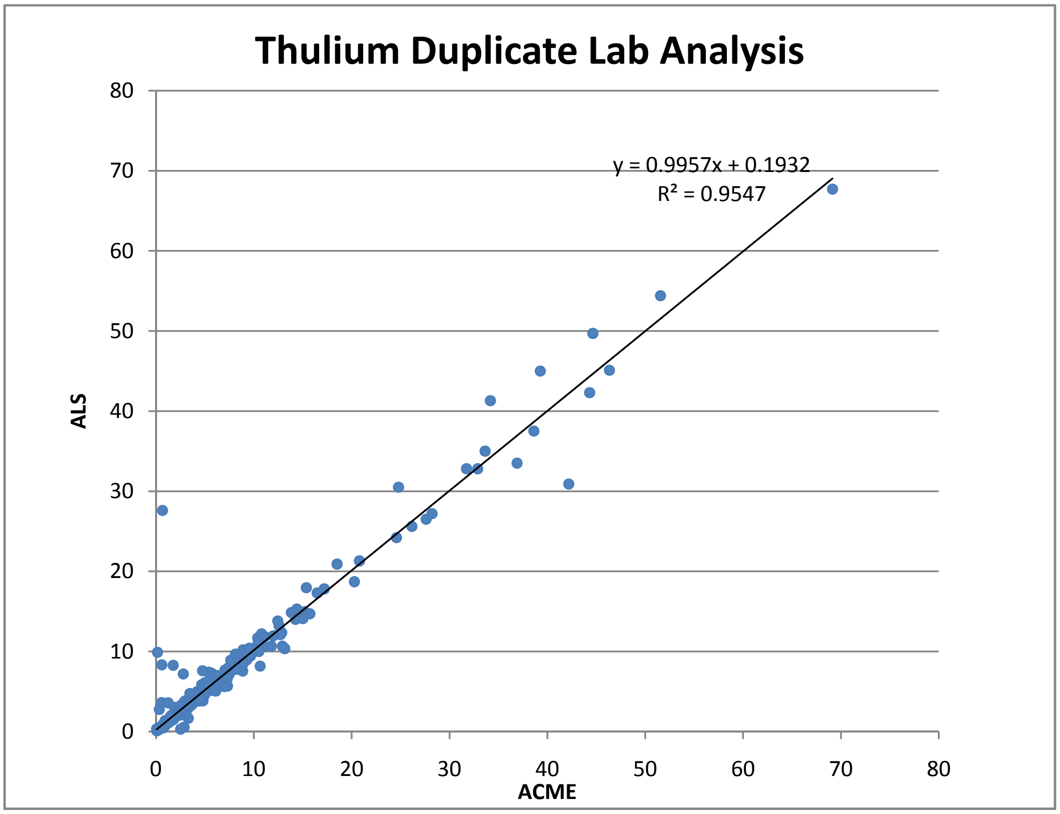
Holmium Duplicate Lab Analysis
y = 1.0068x + 1.5173
R² = 0.9379
ALS
ACME
250
200
150
100
50
0
0
50
100
150
200



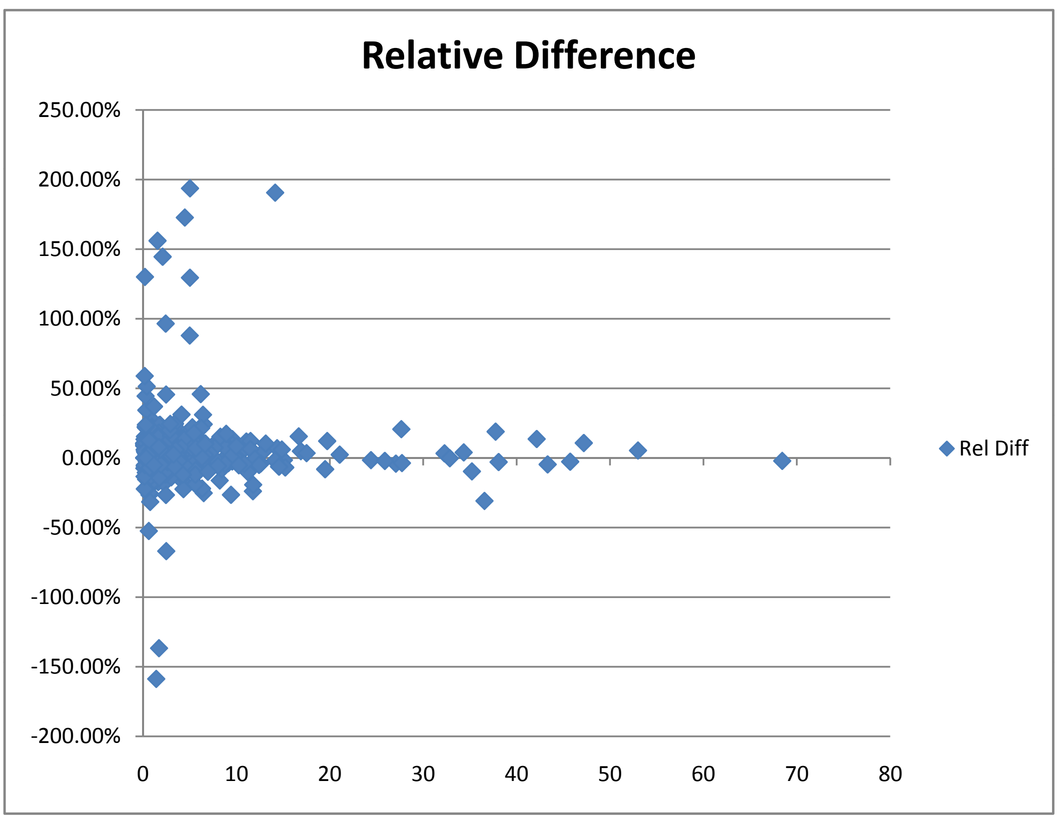
Relative Difference
250.00%
200.00%
150.00%
100.00%
50.00%
0.00%
-50.00%
-100.00%
-150.00%
-200.00%
0
50
100
150
200
250
Rel Diff


Erbium Duplicate Lab Analysis
y = 1.0851x + 5.4884
R² = 0.9372
ALS
ACME
0
100
200
300
400
500
600

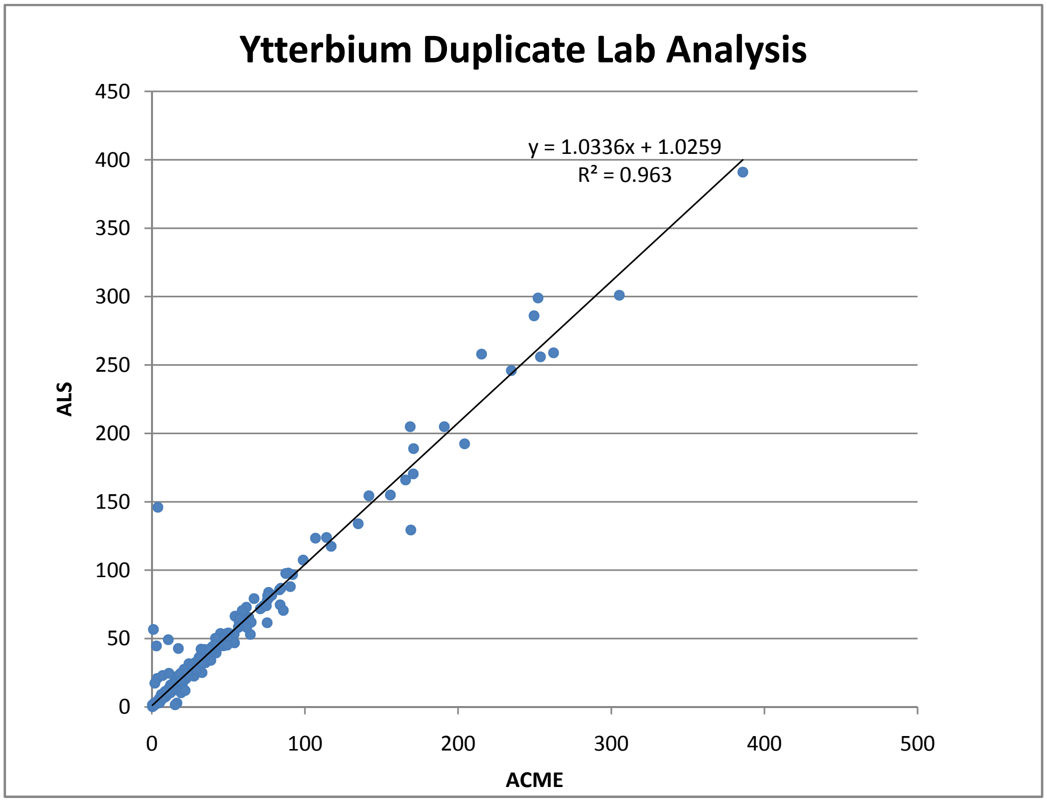

Relative Difference
250.00%
200.00%
150.00%
100.00%
50.00%
0.00%
-50.00%
-100.00%
-150.00%
-200.00%
0
100
200
300
400
500
600
Rel Diff

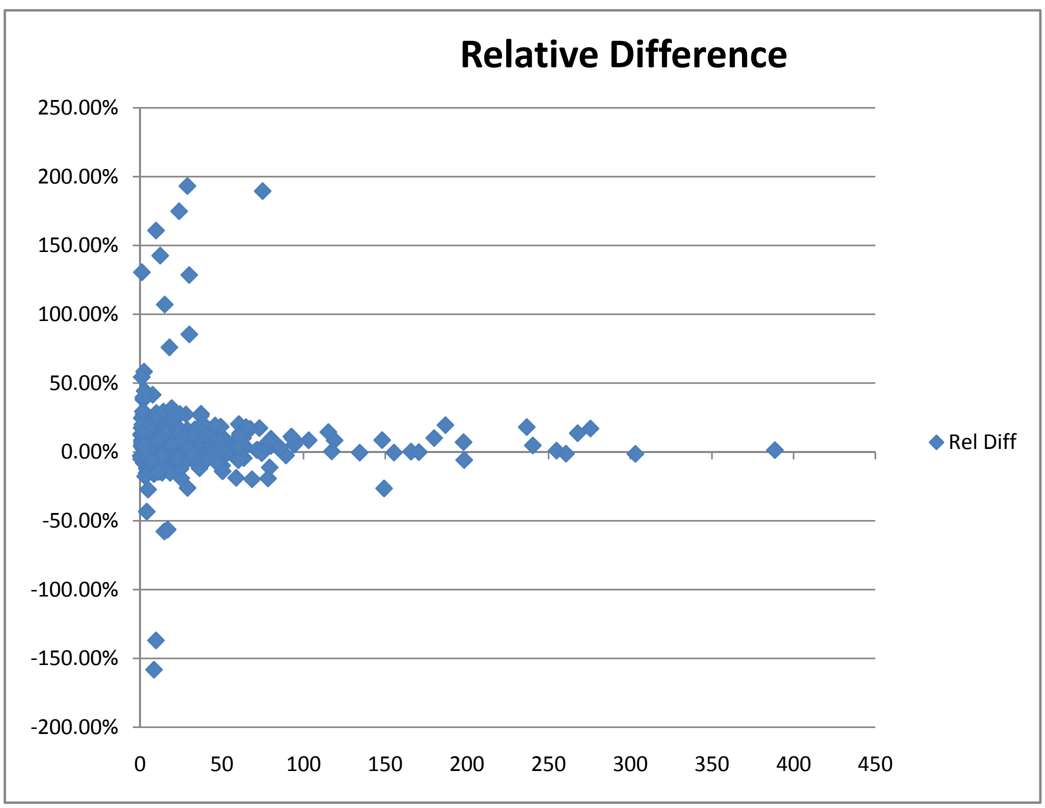


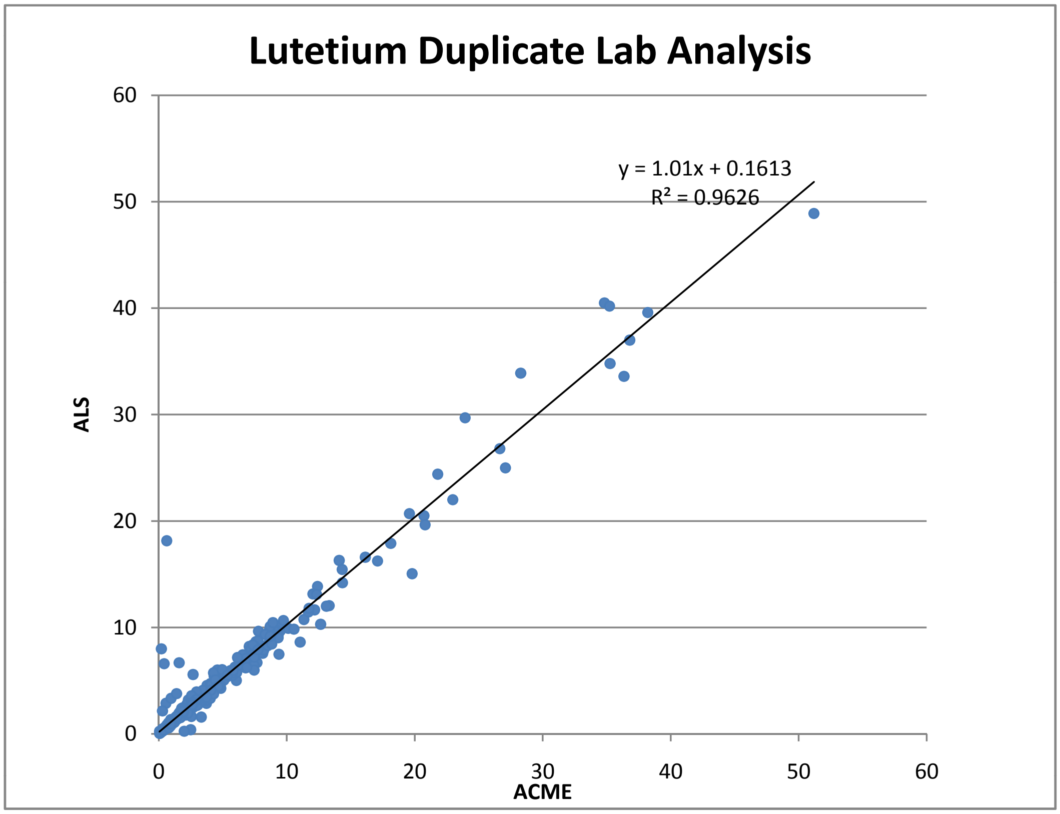
Thulium Duplicate Lab Analysis
y = 0.9957x + 0.1932
R² = 0.9547
ALS
ACME
0
10
20
30
40
50
60
70
80



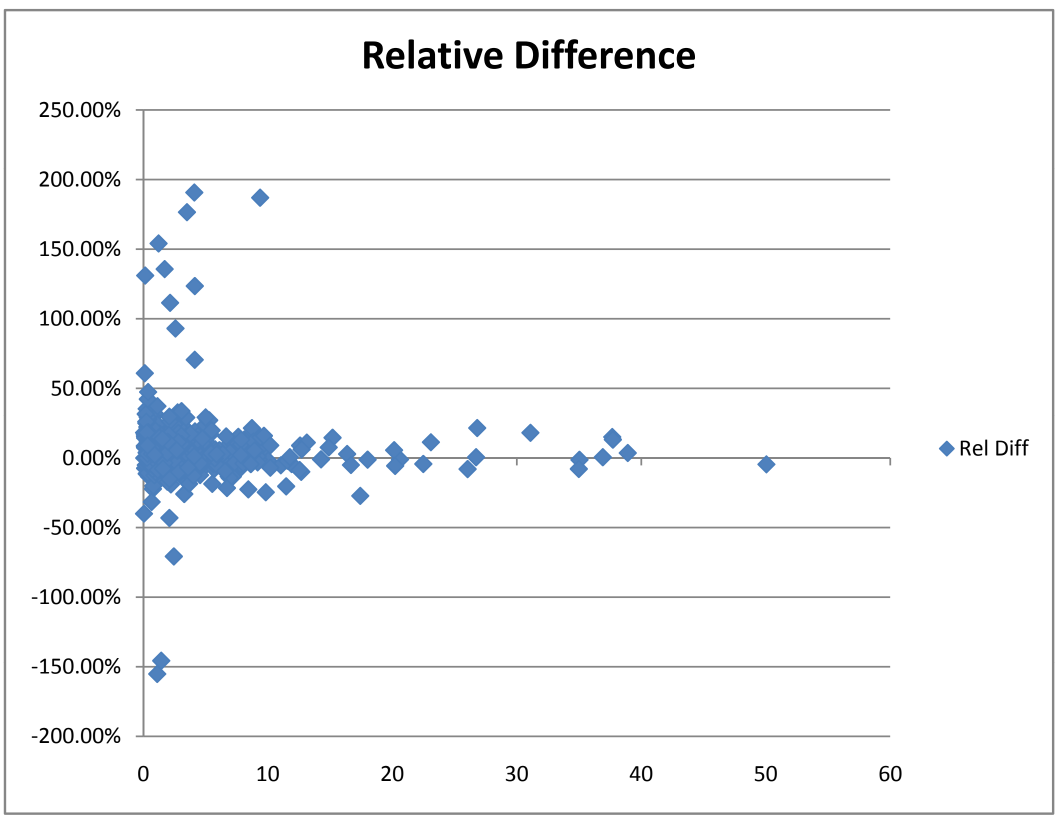
Relative Difference
250.00%
200.00%
150.00%
100.00%
50.00%
0.00%
-50.00%
-100.00%
-150.00%
-200.00%
0
10
20
30
40
50
60
70
80
Rel Diff


Ytterbium Duplicate Lab Analysis
y = 1.0336x + 1.0259
R² = 0.963
ALS
ACME
0
50
100
150
200
250
300
350
400
450
0
100
200
300
400
500


Relative Difference
250.00%
200.00%
150.00%
100.00%
50.00%
0.00%
-50.00%
-100.00%
-150.00%
-200.00%
0
50
100
150
200
250
300
350
400
450
Rel Diff



Lutetium Duplicate Lab Analysis
y = 1.01x + 0.1613
R² = 0.9626
ALS
ACME
0
10
20
30
40
50
60



Relative Difference
250.00%
200.00%
150.00%
100.00%
50.00%
0.00%
-50.00%
-100.00%
-150.00%
-200.00%
0
10
20
30
40
50
60
Rel Diff