

**MODULE 2- ZINC MINING IN CANADA**

At the end of 2015, there were five mines in commercial operation producing significant quantities of zinc in Canada. These mines are listed in Table 1 which illustrates recent production figures and also forecasts production to 2022. As illustrated, all but one will exhaust known reserves within roughly six years.

**Table 1 Historic and Projected Canadian Zinc Mine Production**

Mine	Owner	Status	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Brunswick	Glencore	cl	185.7	52	0	0	0	0	0	0	0	0	0
Perseverance/Bracemac-McLeod	Glencore	cl/op	125.2	74.5	74.8	52	60	60	50	50	40	0	0
Kidd Creek	Glencore	op	78.1	67.8	61	63.2	65	65	65	65	55	45	10
Caribou	Trevali	ru	0	0	0	13	35	40	40	40	40	40	20
Duck Pond	Teck	cl	18.9	12.2	15.6	8	0	0	0	0	0	0	0
La Ronde	Agnico Eagle	op	45.4	19.8	10.5	3.5	4.1	5	5	5	5	5	5
Flin Flon Mill (777)	Hudbay	op	63.7	51.8	40.7	33.7	35	47	47	47	24	0	0
Snow Lake Mill (Chisel N/Lalor)	Hudbay	cl/op	17.2	34.7	41.9	69.2	77	75	73	72	70	70	70
Langlois	Nyrstar	op	32	36	38	39.9	40	40	40	40	30	0	0
Myra Falls	Nyrstar	c&m	32	27	27	9	0	0	0	0	0	0	0
Yukon Zinc		fl	24.4	37	23	4.1	0	0	0	0	0	0	0
<b>Total</b>			<b>622.6</b>	<b>412.8</b>	<b>332.5</b>	<b>295.6</b>	<b>316.1</b>	<b>332</b>	<b>320</b>	<b>319</b>	<b>264</b>	<b>160</b>	<b>105</b>

cl= closed, op= operating, ru= ramping up, c&m= on care and maintenance, fl= currently flooding

One past producer (Caribou) re-entered production in late 2015 and two additional past producers remain shuttered as illustrated.

Agnico Eagle's La Ronde mine has mined through the zinc rich portion of the predominantly gold ore body so is not expected to be a significant producer going forward.

The well-known Brunswick and Perseverance mines closed in 2013, Teck's Duck Pond Mine closed in 2015 and Hudbay exhausted reserves at the Chisel Mine in 2012 but utilized workings to access the new Lalor mine nearby.

A key point to make from Table 1 is that all of the current operations are relatively small scale when compared to recent past Canadian producers listed in Table 2. Many of Canada's base metal deposits

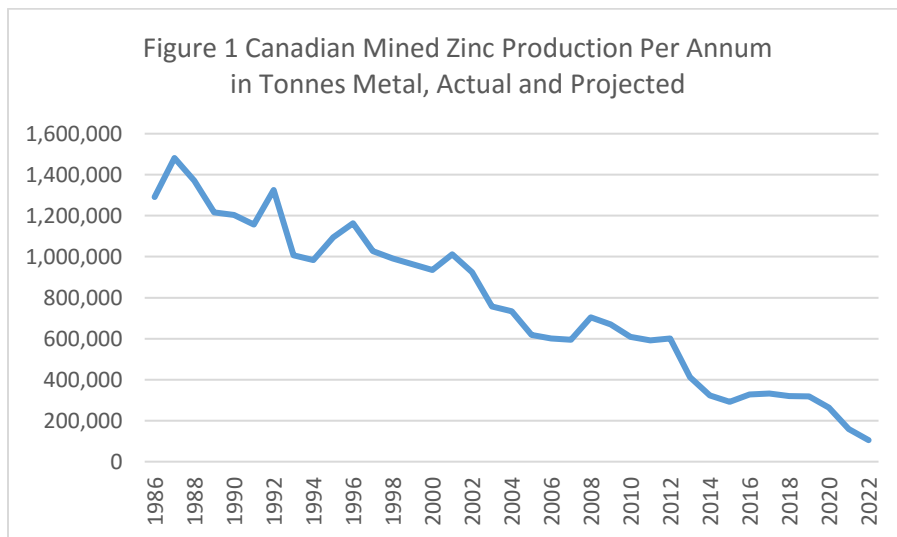
were discovered in the 1950’s and 60’s due to advances in airborne geophysics. Most of these deposits are now mined out.

**Table 2 Past Producing Zinc Mines in Canada**

Mine	Steady State Zinc Production per annum (T)	Year closed	Metals Produced
Sullivan	90,000	2001	Zn/Pb/Ag
Polaris	150,000	2003	Zn/Pb/Ag
Pine Point	125,000	1987	Zn/Pb/Ag
Faro	150,000	1998	Zn/Pb/Ag
Kidd Creek	150,000	~2022	Cu/Zn/Ag
Brunswick	250,000	2013	Zn/Pb/Cu/Ag
Mattabi	50,000	1993	Zn/Cu/Ag
Mattagami Lake	60,000	~1982	Zn/Cu/Ag
Geco	40,000	1995	Cu/Zn/Ag
H/W	55,000	c&m	Cu/Zn/Ag/Au
Perseverance	125,000	2013	Zn/Cu/Ag
Trout Lake	40,000	2011	Zn/Cu/Ag/Au
Nanisivik	50,000	2002	Zn/Ag

Kidd Creek is projected to be exhausted in 2022. The H/W (Myra Falls) mine is for sale.

Table 3 and Figure 1 illustrate the demise of the Canadian zinc mining industry since the mid-80’s. There are no signs that Canada will reverse the fall in zinc production unless there is a sharp and sustained increase in zinc prices combined with the discovery of additional deposits. Known unmined deposits have failed economic hurdles in the past and without a step change in zinc prices in particular, will likely fail once again. From a position of dominance in the mid-80’s Canada could be down to one mine only at current zinc prices by 2022 (Hudbay’s Lalor).





**Status of Current Producers**

**Hudbay- 777 Mine and Lalor Mine**

**777 Mine**

The 777 mine is located in Flin Flon Manitoba and has been in production since 2004. Based on remaining reserves, the mine is expected to be exhausted in 2020. This underground mine uses blasthole stoping to mine 1.2-1.6 million tonnes of ore per annum. Table 4 lists remaining reserves and 2015 production figures. Copper rich areas have been targeted in preference to zinc meaning that the remaining years of the mine life should be more zinc rich instead.

**Table 4 777 Mine Reserves as of Jan. 1,2016 and 2015 Production**

	<b>Tonnes</b>	<b>Cu%</b>	<b>Zn%</b>	<b>Au (g/t)</b>	<b>Ag (g/t)</b>
<b>P+P Reserves</b>	6,302,000	1.66	4.82	1.88	27.23
<b>2015 Production</b>	1,235,053	1.99	3.04	1.58	19.42

2015 costs were \$C60.33/tonne ore mined and a further \$C14.04/tonne for milling. Finding additional resources for mining are not expected and there are minimal current resources that could be converted to reserves.



## Lalor

Production at the new Lalor mine near Snow Lake has been ramping up since 2012. The 3,000 tpd mill can treat over 1 MT of ore per annum. Initial mining has focused on higher zinc grade resources while production was ramping up. Table 5 illustrates the current reserves and 2015 production figures. The potential to increase reserves is very good. The mined zinc grade is decreasing steadily towards the average reserve grade so zinc production is not likely to increase appreciably despite mining more tonnage a year. Hudbay has also acquired the Britannia mill in Snow Lake to allow a further increase in treatment capacity. It is uncertain however whether this mill will be strictly used for the milling of gold rich/base metal poor zones or general run of mine ore. Nevertheless, Hudbay has not announced the expenditure of capital for this project as yet. Mining and milling costs in 2015 were \$C75.20/tonne and \$C26.78/tonne respectively. The unit costs listed for both mines provide retail investors with a good benchmark when reviewing underground base metal mining PEA's.

**Table 5 Lalor Reserves as of Jan. 1,2016 and 2015 Production Results**

	<b>Tonnes</b>	<b>Cu%</b>	<b>Zn%</b>	<b>Au (g/t)</b>	<b>Ag (g/t)</b>
<b>P+P Reserves</b>	15,285,000	0.72	5.65	2.54	25.29
<b>2015 Production</b>	934,277	0.71	8.18	2.53	21.38



When the 777 Mine is depleted, the zinc in concentrate produced at the existing Snow Lake mill may not be sufficient to operate the zinc plant (110,000 tpa) in Flin Flon at full capacity so an alternate feed source may be necessary.

**Langlois**

In January 2016 Nyrstar, the operator of the Langlois mine amongst others, put the mine up for sale.

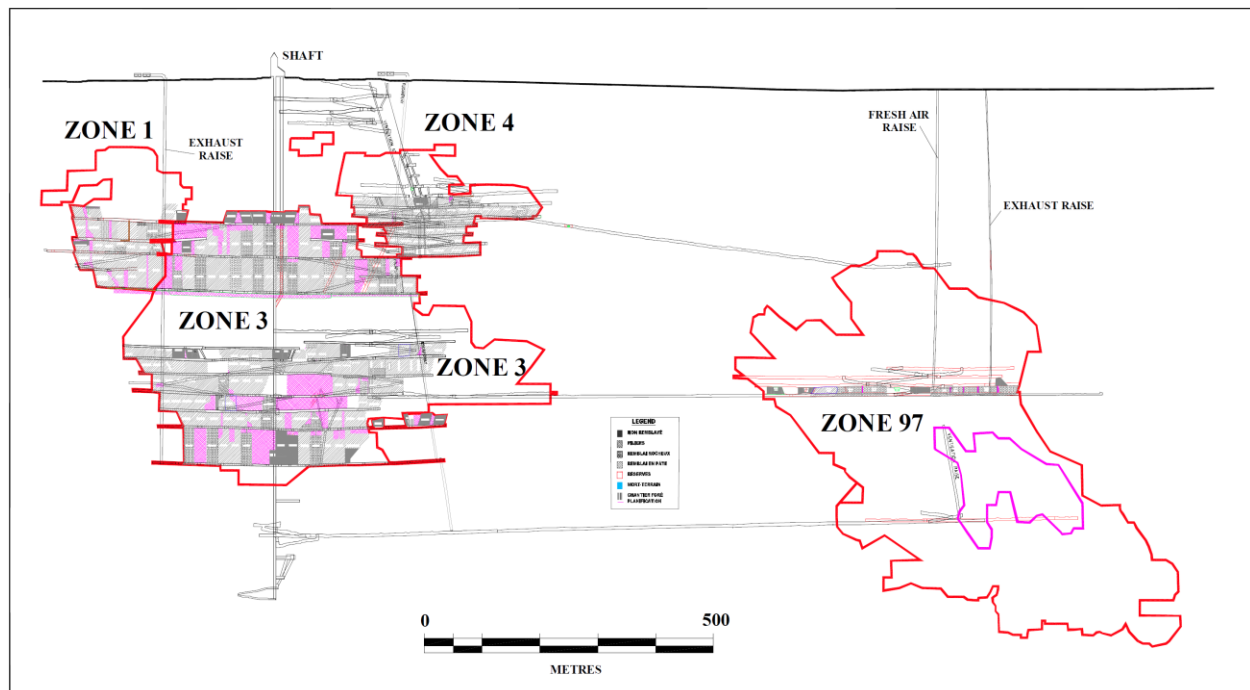
The Langlois zinc deposit consists of four steeply dipping narrow width (1-8m) lenses of predominantly zinc mineralization. Blasthole stoping is the mining method used and this has led at times to high waste dilution in the ore due to blast overbreak. Proven and probable reserves are listed in Table 6. Although mill capacity is over 800,000 tpa, the mine typically only supplies roughly 500,000 tpa with grades in the 8-9% zinc range. Nyrstar does not report annual metrics apart from mine zinc output and tonnage mined so the grade for 2015 production illustrated is based on assumed mill recoveries of 92% Zn.

**Table 6 Langlois Reserves as of Jan. 1,2016 and Estimated 2015 Production Results**

	Tonnes	Cu%	Zn%	Pb%	Au (g/t)	Ag (g/t)
<b>P+P Reserves</b>	1,370,000	0.66	9.41	0.23	0.05	46.78
<b>2015 Production</b>	511,000	0.60	8.5	0.20	0.04	40

Minimal exploration appears to have been conducted since 2012 so I presume the mine will close in about four years’ time assuming some conversion of resources into additional reserves. Modest extensions to current zones are possible but it is uncertain whether there is any financial incentive currently to pursue a mine life extension particularly since the owner has decided to exit the mining business.

**Extent of Mine Workings as of 2010 (from NI 43-101)**

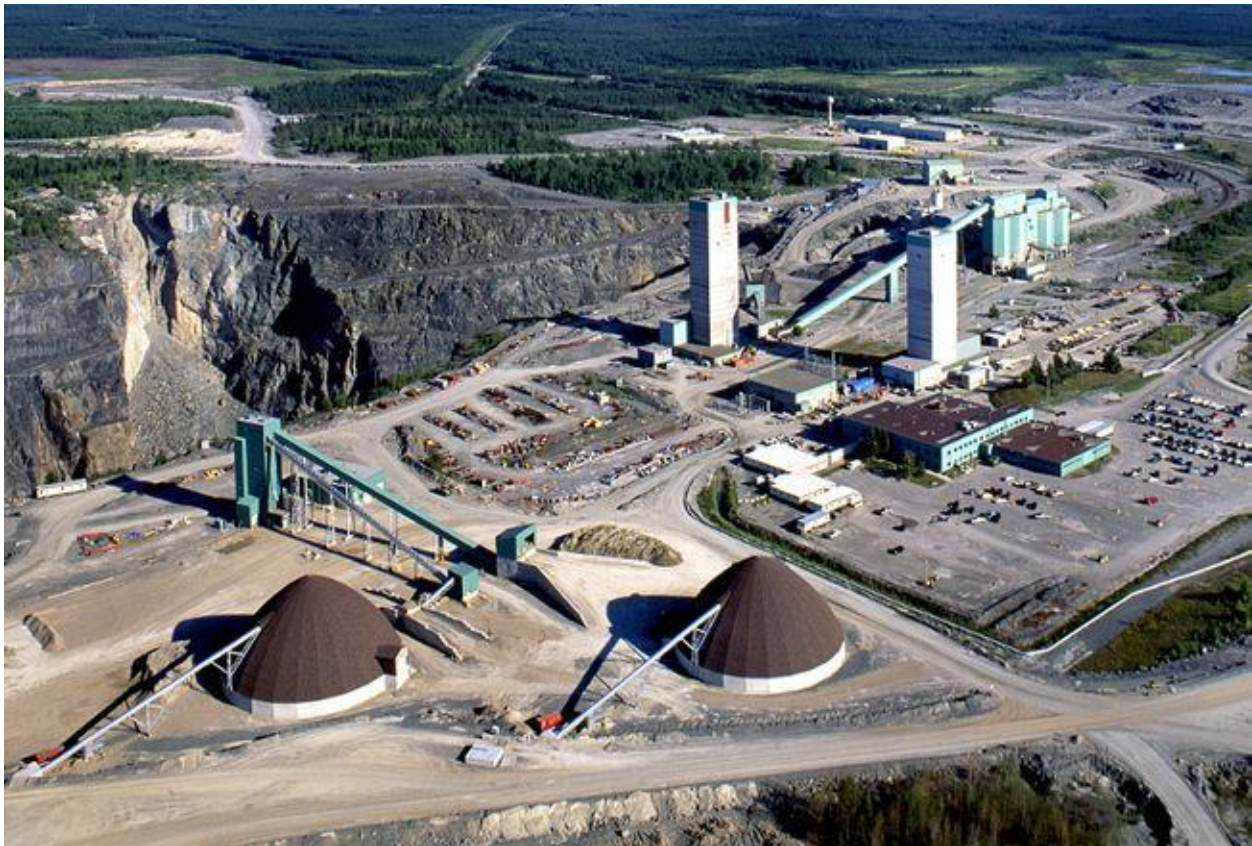


### Kidd Creek

The prolific Kidd Creek mine is expected to continue mining until early 2022. The depth of mining will be almost 3,000m by that time. Mining commenced as an open pit in 1966. Remaining reserves and recent production figures are illustrated in Table 7. There are no plans to chase the ore zone below 3,000m and attempts to discover other discrete zones have not been successful. Blasthole stoping is the mining method used. I almost took a job here in the 80's but moved to Australia instead.

**Table 7 Kidd Creek Reserves as of Jan. 1,2016 and 2015 Production Results**

	Tonnes	Cu%	Zn%	Ag (g/t)
<b>P+P Reserves</b>	10,000,000	1.80	4.3	49
<b>2015 Production</b>	2,150,000	1.90	3.6	46

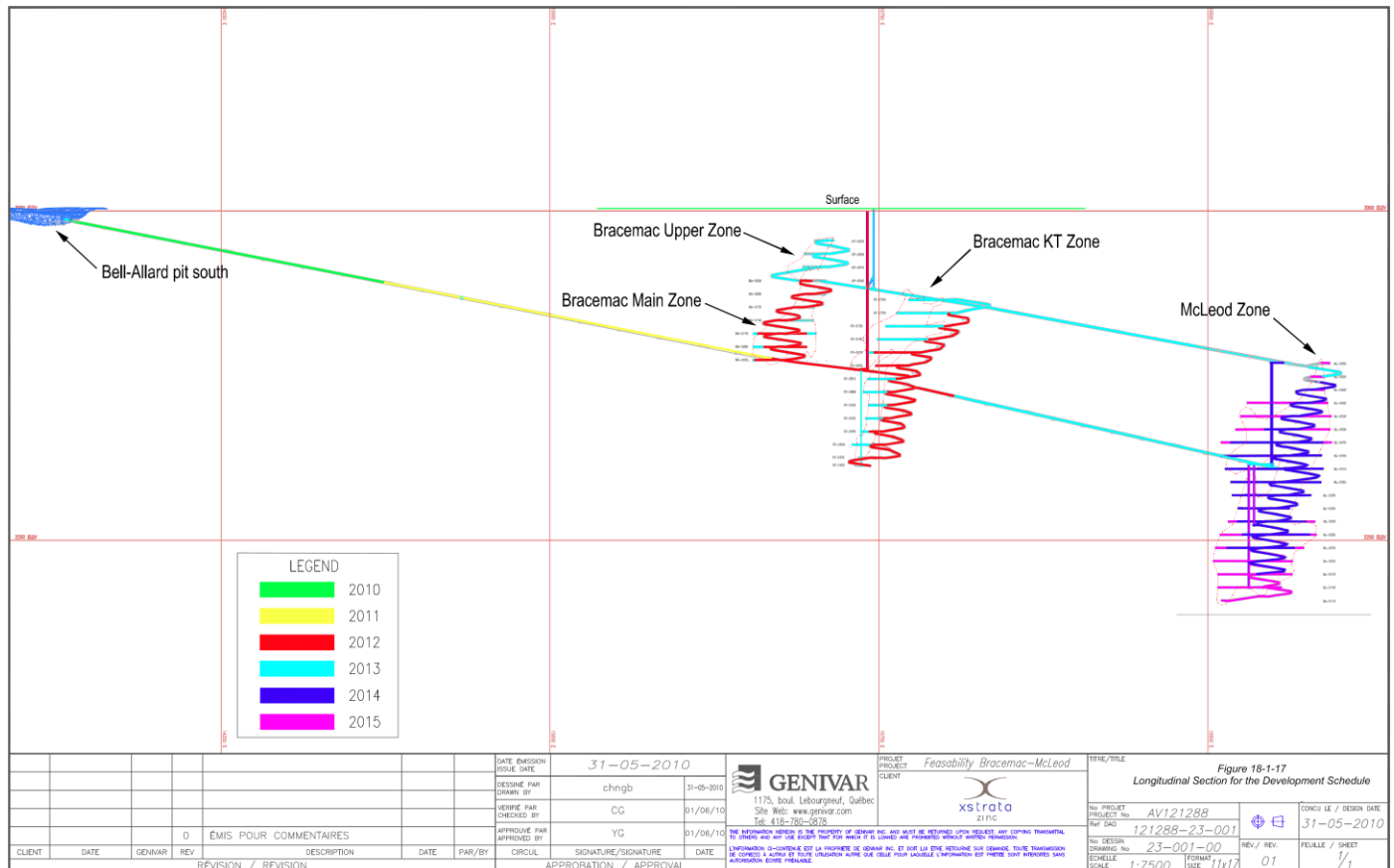


**Bracemac-McLeod**

The Bracemac-McLeod mine is located in the Mattagami mining camp in northern Quebec. The original Mattagami mine operated until the early 80's. Since that time a number of small high grade deposits have been mined periodically (Bell Allard, Norita, Isle Dieu, Perseverance) in order to feed the original Mattagami mill. The Bracemac-McLeod deposit represents the last of the known economic deposits in the area. Without further exploration success, the camp will be exhausted of ore. Glencore states that current reserves are sufficient for operations until Q1 2018. However, additional resources (McCleod Deep Zone) are currently the subject of a feasibility study so it is assumed they will likely extend the mine life to perhaps 2020. As illustrated below the mine consists of a number of zones requiring substantial mine development to extract a modest reserve base.

**Table 8 Bracemac-McLeod Reserves as of Jan. 1,2016 and 2015 Production Results**

	Tonnes	Cu%	Zn%	Au (g/t)	Ag (g/t)
<b>P+P Reserves</b>	5,400,000	1.1	6.7	0.6	25
<b>2015 Production</b>	900,000	1.0	6.0	0.34	19





## Caribou

Trevali's Caribou zinc mine is currently ramping up to full production. This project has had numerous false starts in the past by other owners due to the fine grained nature of the mineralization leading to poor recoveries and concentrate grades in the mill. With the help of Glencore, Trevali appears to have largely overcome these issues. Commercial production was recently declared with current milling rates in the 2,500 tpd range at acceptable concentrate grades and recoveries.

Trevali did not advance studies beyond the Preliminary Economic Assessment stage therefore has no official reserves. Roughly 50% of the resources planned for milling are in the inferred resource column only. Nevertheless, mining is projected out to the 2021-22 timeframe. Fingers crossed obviously. Resources planned for mining and the first six months of 2016 results are illustrated in Table 9. It will likely take a couple more quarters of operation to determine what the site operating costs will be and whether mining will generate attractive returns or not.

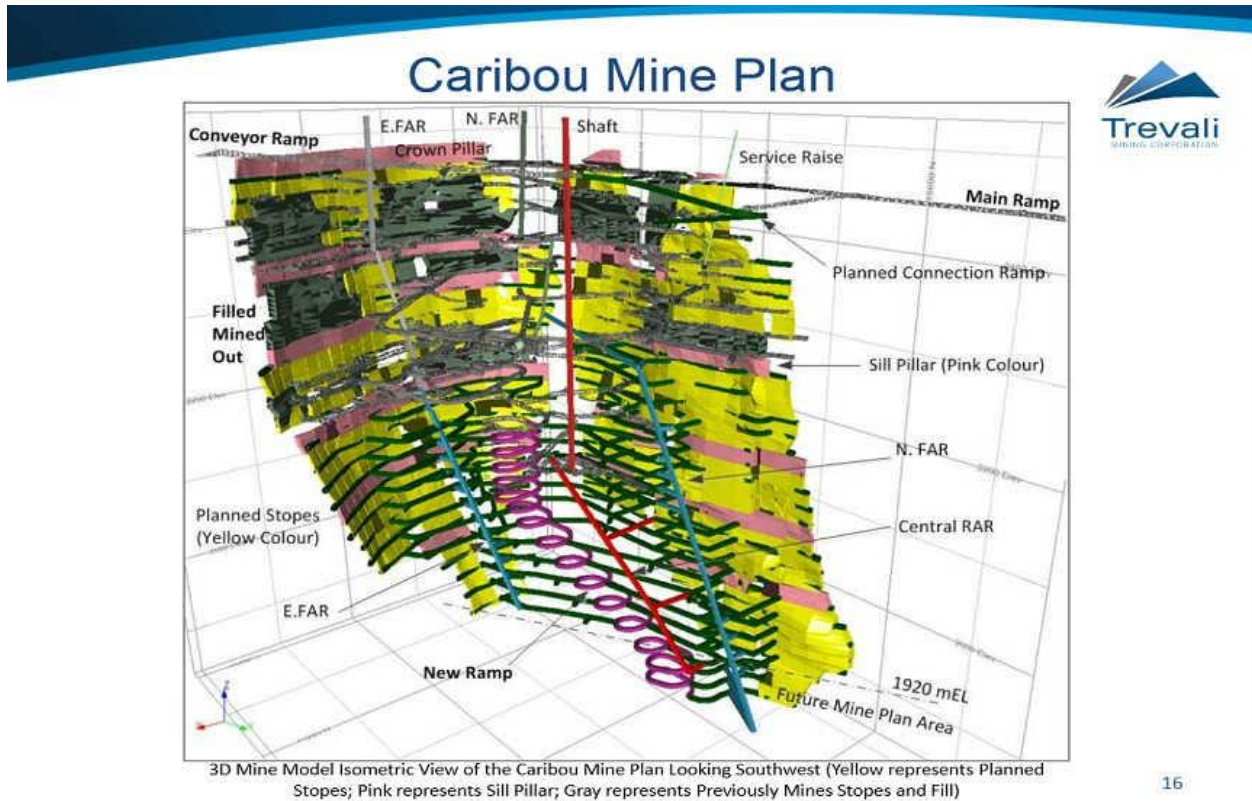
**Table 9 Caribou Plant Feed Estimate as of mid-2015 (NI 43-101) and H1 2016 Production Results**

	Tonnes	Cu%	Zn%	Pb%	Au (g/t)	Ag (g/t)
<b>M + I PFE</b>	3,014,000	0.33	6.18	2.46	0.89	68.11
<b>Inferred PFE</b>	3,138,000	0.35	6.04	2.52	0.83	67.7
<b>H1 2016 Production</b>	386,000	nr	5.9	2.6	nr	63

nr- not reported, no copper concentrate produced.

Glencore's interest in Trevali appears to be to secure the concentrate supply for downstream processing at their smelters in a quickly tightening market.

Retail investors need to be aware that other small miners have not fared well in similar partnerships with Glencore. Donner Minerals were a 35% owner of Bracemac-McLeod for instance but shareholder equity was effectively wiped out when they could not forward their portion of the capital necessary to keep mine development underway. Katanga Mining shareholders have had a similar experience with Glencore in Africa. So potential shareholders of Trevali need to bear in mind that they have outstanding and overdue loans from Glencore and may suffer a similar fate if the Santander mine in Peru in particular cannot generate the necessary free cash flow to pay off these debts. I suspect Trevali may attempt to raise more equity because of this and could be a serial miner of the stock markets going forward. Shareholders could bear considerable dilution. Glencore may end up with the mines and shareholders may end up with the shaft. Watch the cash flow statements carefully. Having no declared reserves at either mine is troubling indeed.



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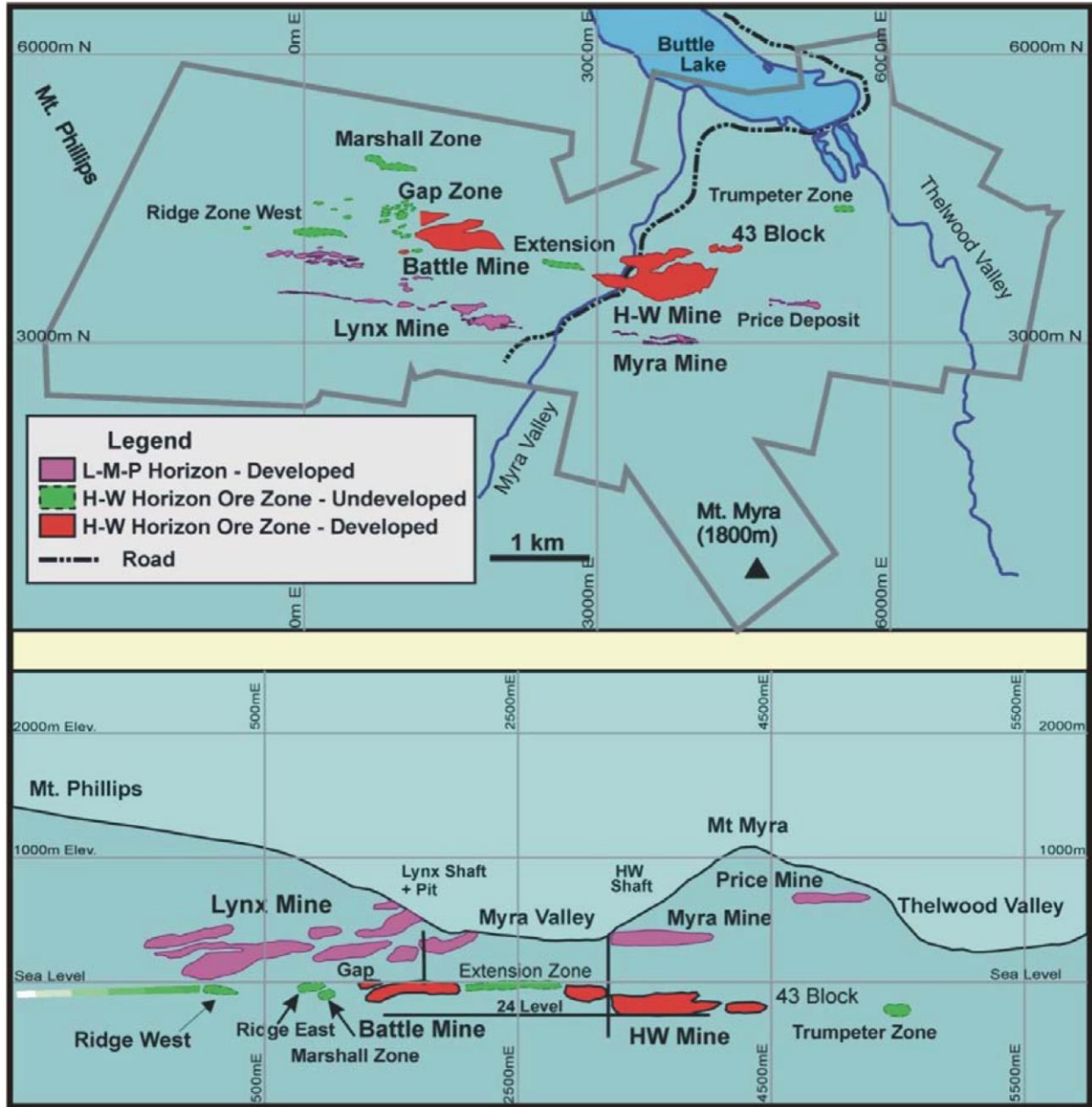
**Myra Falls**

Nystar placed this mine on care and maintenance in 2015 and the operation is currently for sale. This mine commenced operations in 1966. Remaining reserves, listed in Table 10 are essentially high mining cost smallish massive sulphide lenses that are discovered periodically through concerted exploration campaigns. Mining areas are well scattered over many kilometres laterally as illustrated below. According to a 2004 NI 43-101 report, waste dilution levels are high (~ 30%) and resource extraction percentages are low (~70%). Nyrstar is the fourth owner of the mine but are looking to pass on the excitement (and reclamation liabilities?) to a fifth. Only high base and precious metal prices would likely make this an attractive proposition.

**Table 10 Myra Falls Reserves as of Jan. 1,2016 and Estimated 2015 Production Results**

	Tonnes	Cu%	Zn%	Pb%	Au (g/t)	Ag (g/t)
<b>P+P Reserves</b>	4,660,000	0.95	6.91	0.74	1.76	72.5
<b>2015 Production</b>	145,000	nr	nr	nr	nr	nr

The mine was placed on care and maintenance in 2015. 466,000 tonnes were mined in 2014 for 27 kt zinc in concentrate.



**Yukon Zinc**

This Chinese owned deposit entered bankruptcy protection in 2015 and it is unlikely to reopen. The pumps have been turned off and workings are flooding. There is thought to be 2-3 years of reserves remaining.

### Undeveloped Deposits

Table 11 provides a partial list of undeveloped projects in Canada that may have some merit for exploitation at considerably higher zinc prices. Note that this list is for the better known deposits that typically have a declared resource. Less advanced projects, or grassroots plays are not listed. Figures are from annual reports or the latest publicly available NI 43-101 report and may not represent current figures based upon further exploration or assessment.

**Table 11 Undeveloped Predominantly Zinc Projects in Canada**

Deposit	Company	Location	Tonnes MT	Zn %	Cu %	Pb %	Au g/t	Ag g/t	
Hackett River	Glencore	Nunavut	27	4.5	0.5	0.6	0.3	130	Ind.
			60	3.5	0.4	0.5	0.2	150	Inf.
Howards Pass	Selwyn Chihong	Yukon	185.6	5.2		1.79			Ind.
			237.9	4.47		1.38			Inf.
Tom and Jason	Hudbay	Yukon	6.4	6.33		5.05		56.55	Ind.
			24.55	6.71		3.48		33.85	Inf.
Hanson Lake (McIlvenna Bay)	Foran	Sask.	13.9	2.67	1.28		0.49	17.1	Ind.
			11.3	2.97	1.32		0.43	17.5	Inf.
Prairie Creek	Canadian Zinc	NWT	1.5	13.2		10.8		200	M
			7.2	8.7		8.5		123	Ind.
			7.0	11.3		7.7		166	Inf.
Halfmile- Stratmat	Trevali	NB	4.7 St	5.3	0.4	2.1	0.6	49	Ind.
			2.4 St	4.8	0.7	2.1	0.4	39	Inf.
			6.3 Hm	8.13	0.22	2.58		30.78	Ind.
			6.1 Hm	6.69	0.14	1.83		20.51	Inf.
High Lake	MMG	Nunavut	7.9	3.5	3.0	0.3	1.3	83	Ind.
			6.0	4.3	1.8	0.4	1.3	84	Inf.
Izok Lake	MMG	Nunavut	13.5	13.3	2.4	1.4	0.2	73	Ind.
			1.2	10.5	0.4	1.3	0.2	73	Inf.
Tulsequah Chief	Chieftain	BC	0.8	8.6	1.57	1.5	2.8	106	M
			5.8	6.5	1.3	1.4	2.8	105	Ind.
			1.9	4.5	0.5	1.3	2.6	99	Inf.

M- measured resources, Ind.-indicated resources, Inf. Inferred resources.

**Note:** Resources are not reserves. Reserves, if established will be a fraction of resources listed and will include provision for waste dilution. Inferred resources cannot be used for economic assessments though it does not appear to stop some.

## Preliminary Comments

**The comments below are not meant to endorse or question the potential of any of the deposits listed in Table 11.** They are merely the ramblings of a mining engineer scrounging around for something decent to invest in. There are commodity prices that will make any deposit economic. But there is no point investing in a mine firmly in the fourth quartile of operating costs either. I purposely shy away from the economics of any given project here since I would have to set up a decent financial model for each. I'd rather be golfing.

Although I am the last to promote "social mining" many deposits in Canada were developed with assistance from the Canadian government. Namely road construction.

[https://en.wikipedia.org/wiki/Roads\\_to\\_Resources\\_Program](https://en.wikipedia.org/wiki/Roads_to_Resources_Program)

Many of the deposits in Table 11 need similar assistance. Only British Columbia currently seems to see the collective wisdom of extending power grids and roads to the more remote locations to make deposits such as Red Chris viable hence getting a payback through economic activity. This used to be called nation building.

## Hackett River

This deposit has the potential to be a high throughput open pit mine. 12,000-15,000 tpd milling has been proposed which could put annual zinc production greater than 150,000 t. A 75 km road from Bathurst Inlet is required for access and a port must be established at this location. The port would be seasonal with roughly a four month shipping/receiving potential. Glencore inherited this deposit with the Xstrata acquisition and appears to have done little with it since. The approvals process in Nunavut is torturous so it would likely take many years for any sort of construction decision.



Reference: Sabina Gold and Silver Corp. PEA NI 43-101 Dec. 23, 2009. [www.sedar.com](http://www.sedar.com)

### Howards Pass

Although there seems to have been ample studies of the resource present at Howards Pass, I have not come across any technical studies pertaining to the open pit or underground potential of this resource. Although year round access to the mine will be possible, should permission be granted to upgrade an existing road from the Cantung mine area, the concentrate haulage distance to port or rail head will be significant. On site power generation is also required. The owner is apparently conducting economic studies but has delayed commencement of the approvals process so no project description is available. The lack of silver in the deposit is a big minus. Also, the foreign mining pedigree of the owner is unknown.

Having stated the above, numerous miners have overcome the poor logistics in the area in the past (Cyprus Anvil at Faro, Capstone at Minto and North American Tungsten at Cantung). This appears to be a “go big or go home” proposition with capital costs likely in the \$1.5B-\$2B range.

**Reference:** ScoZinc Mining Ltd. (formerly Selwyn Resources Ltd.) NI 43-101 reports, June 29, 2012 and September 27, 2012. [www.sedar.com](http://www.sedar.com)

### Tom and Jason

These deposits, near Howards Pass, have been known for over 60 years but have yet to be developed. A 1985 feasibility study proposed a 4,500 stpd 15 year underground mine at a capital cost of C\$335 million but did not pass economic muster. Road access to site is available but whether this road needs upgrading is not known. It does not appear that Hudbay has done much or any work on these deposits since 2007. Similar to other deposits in the area, getting the concentrate to market will be costly. However, these deposits could likely support a reasonably high zinc production rate.

**Reference:** Hudbay Minerals, NI 43-101 Report, May 24, 2007 [www.sedar.com](http://www.sedar.com)

### Hanson Lake (McIlvenna Bay)

Although the resources listed in Table 11 appear to indicate a reasonable balance between copper and zinc, these figures are actually a compilation of discrete zinc rich or copper rich zones. As such, it is possible to concentrate on the mining of one metal only if desired.

At one time I was in possession of a substantial file on this deposit since it was a Cameco asset. Back then, and still, it only seems to make sense to me if this orebody is owned by Hudbay and they develop a ramp operation to selectively mine high grade zinc zones and then ship this ore on existing roads to the Flin Flon concentrator for processing. This would be in order to keep the Flin Flon zinc plant full once the 777 mine is exhausted. So perhaps a JV or takeover is in the cards here. It does not make any sense to ship zinc concentrate to Trail, Valleyfield, Asia or Europe for processing with a zinc plant just down the highway that is going to be looking for feed.

A 2014 PEA for Foran used a mining rate of 1.8 MTPA and a capital cost for a full mine/mill complex of \$C248.8M. The former strikes me as too high and the later as not credible particularly when Hudbay states that a similar sized concentrator for Lalor would run \$C264M. Operating costs used in the PEA for

the mine plus mill were also \$C23/tonne less than current costs at Hudbay's 777 Mine so this also causes me indigestion. Most PEA's are garbage which is why I never got into the racket.

**Reference:** Foran Mining Corporation, PEA Technical Report McIlvenna Bay Project, Dec 22, 2014.  
[www.sedar.com](http://www.sedar.com)

### **Prairie Creek**

Canadian Zinc Corporation has done a good job shepherding this project through the approvals process and a prolonged period of low commodity prices. I reviewed the recently issued NI 43-101 Prefeasibility Study Update and have the following concerns:

- 1) Most of the ore will be extracted from the Main Quartz Vein which is stated to dip from 70 degrees to vertical. It varies in width from a few centimeters to five metres. Blasthole stoping will be used with 15-20m sublevel intervals. An interval I concur with. What I have trouble with though is the use of only 14% dilution from stoping. Dilution is the amount of waste rock that is unavoidably mined with the ore. The more dilution you have, the lower the ore grade to the mill hence the project revenue takes a hit. This issue is what has made the narrow vein Langlois zinc mine a struggle over the years. There are numerous examples of narrow vein mines experiencing dilution levels of 30-50% so the economics here should be stress tested using say 30% dilution. Mining is done with high explosives, not butter knives. Blasting damages the sidewalls of stopes and the development miners don't always mine precisely on the vein in the first place. And the vein is seldom always perfectly straight. Mining engineers are usually under a great deal of pressure to use minimal dilution figures in studies to puff up the economics and more often than not they knuckle under;
- 2) The mill will have no tailings pond. Tailings will be sent back underground. If the mine has nothing needing filling, filtered tailings will first be stored in a heated building (13 day capacity), then stacked outdoors if necessary, then in the water storage pond if necessary (70 days capacity, re-handle strategy?). My concern is how all this interacts together and what sort of milling and mining delays this might create. Winters are pretty hellish up there so only the tailings in the heated building may be of much use during roughly eight months of the year.
- 3) The mine will be a wet one with inflows up to 200 L/s. The water treatment strategy strikes me as a little light. For instance, what will happen if the water out of the water treatment plant is not to specification and needs retreatment? Will the mine have to shut down if the creek flow rate is excessively low? These sorts of things happen so the amount of piping and storage ponds is often underestimated at the PFS stage. At Rabbit Lake we would have to allow the bottom of the Eagle Point mine to flood out each spring since surface run off requiring treatment overwhelmed water treatment capacity.

Despite what I have stated above, this project is clearly able to get out of the starting gates sooner than most others so I will likely sharpen my pencil on this one shortly. Having a good silver kicker in the lead concentrate pays a lot of bills. Bringing on a credible JV partner would certainly help matters. The project has yet to receive approval for construction of the +\$50M 184 km road to the site which is integral to having suitable project economics. As discussed in Module 1, much of the operating cost entails getting the concentrate to market.



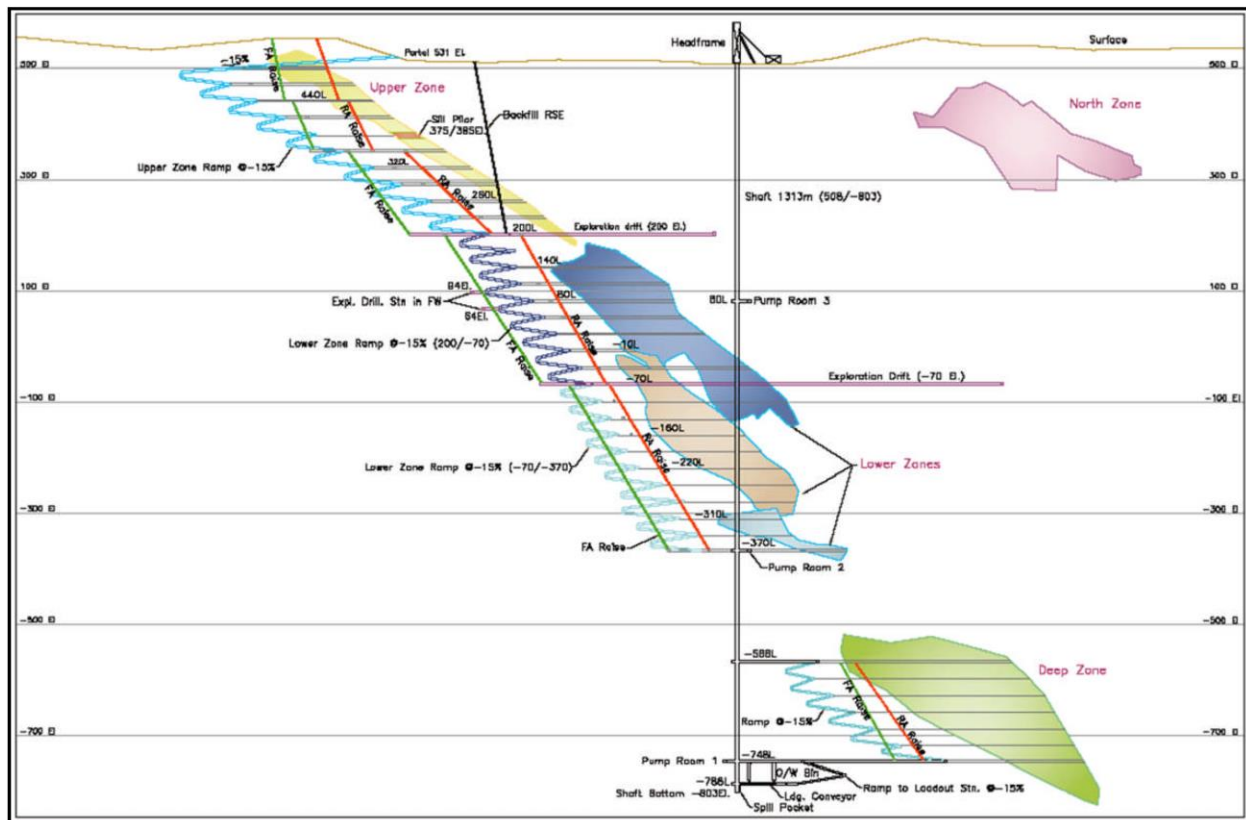
**Reference:** Canadian Zinc Corporation, NI 43-101, March 31, 2016. [www.sedar.com](http://www.sedar.com)

**Halfmile Lake-Stratmat**

A PEA was completed for Trevali on these properties in 2010 and filed on sedar in October 2011. Trevali now states this PEA should not be relied upon and is being currently redone. Also, they have their hands full with Caribou so have put these properties on the back burner for a while.

Mineralization was discovered on both properties in the late 1950’s, early 1960’s. Limited mining has occurred. The Heath Steele mine operated adjacent to Stratmat for many years sporadically. Infrastructure in the area is therefore very good.

Both mines can use ramps from surface to access many of the ore zones and the PEA suggests that most of the mining will be selective cut and fill and blasthole stoping. There is likely no economic justification for sinking the shaft as illustrated from the PEA below for the Halfmile deposit. The tonnes of ore per vertical metre appears to be fairly low for both deposits. This is an important metric for determining economics. Combined with modest ore grades, it is apparent why previous owners did not mine these deposits. Perhaps the best strategy is to ship ore to the Caribou mill when capacity is available should commodity prices warrant this.



**Reference:** Trevali Mining Corporation, NI 43-101 reports, July 6,2015 and October 4,2011.

**Izok Lake/ High Lake**

The locations of these deposits is underlined in the map presented for Hackett River. No one has ever disputed the revenue potential or relative ease of mining these high grade deposits. Unfortunately, they are not located in Sudbury. MMG states a 325 km road and deep water port on the Arctic Ocean must be established and this essentially destroys project economics at current commodity prices.

**Reference:** You can blow your brains out reading all about the proposed mining [here](#).

MMG have retracted this proposal from the approvals process after concluding it is uneconomic.

**Tulsequah Chief**

Occasionally, a new entity comes along (Redfern, Chieftain) and promotes this deposit only to get mired in debt and eventual creditor protection. It is best to ignore the next suitor. The deposit is both remote and small. The only positive is that it has good precious metal credits. The limited tonnage however means that this will likely not be more than a “ma and pa” type operation. In these types of situations (and most mining situations come to think of it), shareholders tend to be looked upon by CEO’s as a source of funds, not as the owners of the company ultimately rewarded with dividends from free cash flow.

**Reference:** Chieftain Metals Corp. NI 43-101, Nov. 27,2014 [www.sedar.com](http://www.sedar.com)

**Noranda Income Fund (Canadian Electrolytic Zinc Refinery)**

Glencore manages this smelter on behalf of the Noranda Income Fund, an income trust set up long ago when Noranda was scrounging around for cash. The management agreement expires shortly. The majority of the feed to this smelter comes from the mines listed in Table 1. As discussed previously these mines have limited lives. Without going into detail, there is the real potential for this smelter to be closed in the next couple of years with the loss of 250,000 tpa of slab zinc to the world markets. This could be good news for the slab zinc market but bad news for miners with respect to treatment charges elsewhere. This will be an interesting story to follow and I cannot predict an outcome here.

The Trail and Flin Flon smelters likely will not have significant issues obtaining zinc concentrate for smelting internally or externally.

## Summary and Conclusion

If you managed to get this far you will have learned:

- Canada's zinc mining industry is in deep trouble and will virtually cease to exist in 5-6 years' time at current commodity prices;
- The candidates to replace lost production have generally been known about for 20-50 years. In other words they have failed to be developed during periods of high commodity prices in the past due to various impediments;
- If the situation in Canada is replicated in numerous other countries (which I will "explore" in further modules, pardon the pun), yet demand continues to increase, or at least not decrease, the price of zinc in particular must rise to a level and sustain this level whereby these deposits become attractive and exploration once again occurs. Since zinc is only one of up to five metals in a typical base metal deposit, I would suggest that a price of \$1.75- \$2.00/lb Zn is necessary. Zinc miners with good reserves currently in production will be the obvious winner during this period.

## DISCLOSURE

The author had received no compensation for the generation of this report. The author may, from time to time have a long or short position in securities mentioned and may make purchases and/or sales of those securities in the open market.

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