A SUMMARY TECHNICAL REPORT ON THE TALVIVAARA MINE, FINLAND

Prepared For

Talvivaara Mining Company Plc

Report Prepared by

srk consulting

SRK Consulting (UK) Limited
UK5430

SRK Legal Entity:		SRK Consulting (UK) Limited
SRK Address:		5th Floor Churchill House 17 Churchill Way City and County of Cardiff, CF10 2HH Wales, United Kingdom.
Date:		February, 2013
Project Number:		UK5430
SRK Project Director:	Richard Oldcorn	Corporate Consultant & Director
SRK Project Manager:	David Pattinson	Corporate Consultant
Client Legal Entity:		Talvivaara Mining Company Plc
Client Address:		Ahventie 4B, 5th Floor Espoo Helsinki Finland FIN - 02170

Table of Contents

List of Tables

List of Figures

SRK Consulting (UK) Limited
5th Floor Churchill House
17 Churchill Way
City and County of Cardiff
CF10 2HH, Wales
United Kingdom
E-mail: enquiries@srk.co.uk
URL: www.srk.co.uk
Tel: + 44 (0) 2920 348 150
Fax: + 44 (0) 2920 348 199

A SUMMARY TECHNICAL REPORT ON THE TALVIVAARA MINE, FINLAND

1 INTRODUCTION

1.1 Background

SRK Consulting (UK) Limited ("SRK") is an associate company of the international group holding company, SRK Consulting (Global) Limited (the "SRK Group"). SRK has been requested by Talvivaara Mining Company Plc ("TMC", hereinafter also referred to as the "Company" or the "Client") to prepare a technical review report of the Talvivaara mining project ("Talvivaara" or "the project") located in Finland.

The technical review report will be used to support a rights issue and a debt facility for TMC.

1.2 Terms of Reference

SRK based the technical review primarily on information provided by TMC in an electronic data room and the data gathered during a site visit conducted between January 7th and 10th 2013. The data analysis in this report is associated only with those areas detailed in the scope of work relating to Geology, Mining, Processing, Infrastructure, Environmental and comments on the Technical-economic model.

James Dendle, Rick Skelton, David Pattinson, Fiona Cessford and Keith Joslin attended the site visit..

TMC provided information to SRK in the electronic data room beginning January 3rd 2013. The data that was provided in the data room was incomplete and several iterations of information request and review were completed before the data was populated to an acceptable level.

Some of the documents provided were in Finnish and were translated by title only, and therefore many of these were not reviewed in depth. This was especially the case for much of the Environmental and Social Management documentation. The content of some documents available in Finnish was discussed with Talvivaara personnel during the site visit.

SRK was given adequate access to Talvivaara site personnel during the site visit.

1.3 Project Team and Responsibilities

The SRK project team and responsibilities are listed below:

- James Dendle, Resource Geologist – Resource and Exploration Potential;
- Mark Campodonic, Principal Resource Geologist - Geology Overview and Review;
- Mike Armitage, Corporate Consultant, Resource Geology - Resource Review;
- Rick Skelton, Corporate Consultant, Mining Engineering;
- Dr. David Pattinson, Corporate Consultant, Metallurgy and Mineral Processing;
- Fiona Cessford, Corporate Consultant, Environment; and
- Keith Joslin, Principal Consultant, Economic Modelling.

Dr. David Pattinson CEng, MIMMM, PhD, who is an employee of SRK is the Competent Person responsible for the processing section and was responsible for the report as a whole. Mr Rick Skelton CEng, MIMMM, MSAIMM, MSc, was responsible for preparing the section on mining. The Competent Person who has reviewed the Mineral Resources as reported by the Company is Dr. Michael Armitage, C. Geol., CEng, FGS, MIMMM, PhD, who is an employee of SRK and a Member of the Institute of Materials, Metals and Mining ("IMMM") which is a 'Recognised Overseas Professional Organisation' ("ROPO") included in a list promulgated by the Australian Stock Exchange from time to time. Dr. Armitage is a mining geologist with over 27 years experience in the mining industry and has been involved in the reporting of Mineral Resources on various properties internationally during the past five years. Dr. Armitage has been involved with the Talvivaara Project in various review capacities since 2006.

1.4 Requirement, Structure and Compliance

REQUIREMENT

This summary technical report has been prepared by SRK in response to a request from the Company. SRK has been informed by the Company that the summary technical report will be used to support a rights issue and possible debt facility as part of a funding exercise for the ongoing development and operation of the Talvivaara mine. The summary technical report may be included in a prospectus to be prepared by the Company in connection with the rights issue (the "Prospectus").

SCOPE OF WORK

The scope of work included:

- Desktop review of available data in the electronic data room;
- Site visit by SRK team;
- Preparation of a Technical Report ("TR") for Talvivaara Mining Ltd limited to Geology, Mining, Processing, Infrastructure, Environmental and comments on the Techno-economic model; and
- Preparation of a Technical Report ("TRP") to be released in to the Public Domain.

COMPLIANCE

SRK has been advised that TMC shares are jointly listed on the Helsinki Stock Exchange and the London Stock Exchange and that the Finnish Financial Supervisory Authority is the competent authority in relation to the rights issue.

As there are no definitive regulatory requirements applicable to the summary technical report, SRK has prepared the technical report in line with reports prepared for a similar purpose taking in to account the limited scope of work to be covered, and broadly to conform with the requirements of the "European Securities and Markets Authority (ESMA) update of the CESR recommendations: the consistent implementation of Commission Regulation (EC) No 809/2004 implementing the Prospectus Directive", specifically Paragraphs 131 to 133, minerals companies, and Appendix II, Mining Competent Person's Report, Recommended Content.

The reporting standard adopted for the reporting of the Mineral Resource is that defined by the terms and definitions given in the 2004 version of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves as published by the Joint Ore Reserves Committee of the Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and Minerals Council of Australia" (the "JORC Code").

The JORC Code is a reporting code which has been aligned with the Committee for Mineral

Reserves International Reporting Standards (“CRIRSCO”) reporting template and is an internationally recognised reporting standard that is recognised and adopted worldwide for market-related reporting and financial investments.

The TR and TRP have been prepared under the direction of the SRK Competent Persons (the “CPs”, in Section 1.3) as defined by the JORC Code, who each assume professional responsibility for certain aspects of the report. The TR and TRP however are published by SRK, the commissioned entity, and accordingly SRK assumes responsibility for the views expressed herein. Consequently, where relevant all references to SRK shall include the CPs and vice versa.

Furthermore, SRK understands that this TR and TRP have not undergone regulatory review and that the Company’s advisers have completed an internal review of these reports.

1.5 Limitations, Reliance on SRK, Declaration, Consent, Copyright and Cautionary Statements

1.5.1 Limitations

To the fullest extent permitted by law, SRK does not assume any responsibility and will not accept any liability to any other person other than the addressees for any loss suffered by any such other person as a result of, arising out of, or in connection with the TR or TRP or statements contained therein.

The Company has confirmed in writing to SRK that, to its knowledge, the information provided by it (when provided) was complete and not incorrect or misleading in any material respect. SRK has no reason to believe that any material facts have been withheld and the Company has confirmed in writing to SRK that it believes it has provided all material information.

The Company has confirmed in writing to SRK that, to the extent permitted by law, the Company indemnifies SRK and its employees and officers in respect of any liability suffered or incurred as a result of or in connection with the preparation of this TR and TRP. This indemnity does not apply in respect of any gross negligence, wilful misconduct or breach of law or if SRK is in breach of its terms of engagement, or where SRK is found to be liable as a person responsible for those portions of the Prospectus that contain information directly sourced from the TR and/or TRP.

1.5.2 Reliance on Information

SRK believes that its opinion must be considered as a whole and that selecting portions of the analysis or factors considered by it, without considering all factors and analyses together, could create a misleading view of the process underlying the opinions presented in the TR and TRP. SRK will review and approve any extracts or summaries of the TR and/or TRP before finalisation of the Prospectus.

1.5.3 Copyright

SRK has assigned copyright and other intellectual property ownership rights in this TR and TRP to the Company who engaged SRK to prepare these reports. It is a condition of that assignment to the Company that the TR and TRP may not be utilised or relied upon by any person other than as expressly named in, nor, for any purpose other than as stated within the TR or TRP and, that SRK shall not be liable to any other person for any loss or damage caused by such use or reliance. Accordingly, SRK hereby gives notice to any other person reading the TR or TRP that SRK accepts no direct responsibility, duty of care or liability for any loss caused by any use or reliance placed upon any information, warranties or representations contained in the TR or TRP including for the purposes of making any investment or raising any finance. In any event, SRK shall not be liable to any person whatsoever for loss caused by use or reliance upon any edited or modified version of the TR or TRP except as approved by SRK.

1.5.4 Declaration

SRK will receive a fee for the preparation of this report in accordance with normal professional consulting practice. This fee is not contingent on the outcome of the Shareholders' vote on the Acquisition and SRK will receive no other benefit for the preparation of this report. SRK does not have any pecuniary or other interests that could reasonably be regarded as capable of affecting its ability to provide an unbiased opinion in relation to the Mineral Assets and the projections and assumptions included in the various technical studies completed by the Company, opined upon by SRK and reported herein.

Neither SRK, the SRK Competent Persons who are responsible for authoring this TR/TRP, nor any Directors of SRK has at the date of this report, nor have had within the previous two years, any shareholding in the Company, the Mineral Assets or advisors of the Company. Consequently, SRK, the SRK Competent Persons and the Directors of SRK consider themselves to be independent of the Company.

In the TR and TRP, SRK provides assurances to the Board of Directors of the Company that the Mineral Resources and any associated technical information where provided by third parties including the Company has been reviewed and, where appropriate, modified by SRK are reasonable, given the information currently available.

The TR and TRP include technical information, which requires subsequent calculations to derive subtotals, totals and weighted averages. Such calculations may involve a degree of rounding and consequently introduce an error. Where such errors occur, SRK does not consider them to be material.

1.5.5 Consent

SRK has given and has not withdrawn its written consent to the inclusion of the TRP, and to the inclusion of any extracts from the TR and/or TRP, in the Prospectus. SRK will review the information contained in the Prospectus, which is extracted from the TR/TRP or based upon information contained in the TR/TRP, and will confirm in writing that the information presented is accurate, balanced, complete and not inconsistent with the TR/TRP. Where any information in the TR/TRP has been sourced from a third party, such information has been accurately reproduced and no facts have been omitted that would render the reproduced information inaccurate or misleading.

SRK has not provided a valuation for the project.

2 PROJECT OVERVIEW

The Talvivaara Project is an operating open pit, two stage bio-heap leaching project that recovers nickel, copper, cobalt, and zinc. A uranium extraction facility is under construction and will recover uranium in the near future. The project is located in the Kainuu Province of Finland. The current owner received title to the Project in February 2004. First production of metals occurred in October of 2008. The Project is planned to operate at an annual production rate of 50,000 metric tonnes per year (t/y) of nickel. The project is currently in the ramp up phase and to date has experienced a number of challenging operational issues. The current production is between 15,000 and 18,000 t Ni/y.

A number of technical issues have been identified which will affect the overall production rate and which have to be addressed to increase the current production rate and to achieve the targeted production rate of 50,000 t Ni/y. The materials handling plant will require additional equipment to achieve the daily throughput necessary for the targeted production capacity. The primary heap leach reclamation methodology is still being developed and has to be improved in order to meet the daily reclaim rate of 72 kt/day. The metal extraction of the bio-heap leaching circuit has not yet achieved the maximum percentage extraction for the primary metals and whilst this has been improving with time it will be at least two years before the target figures can be confirmed. Further work is required to optimise the leaching methodology and to achieve consistent extraction over the whole pad area. The hydraulic throughput of the metals recovery plant has been proven but the plant has not been operated at the maximum metals loading and this will only be proven as the metals extracted in the bio heap leaching increases with time. The chemistry in the plant is still being optimised. An additional hydrogen sulphide plant will be required in order to achieve the 50,000 t Ni/y. Excessive water in the circuit has been problematical and has to be controlled in order to be able to operate the circuit effectively. These issues and the mitigation measures are detailed in the following sections.

3 GEOLOGY AND EXPLORATION

3.1 Introduction

The concession holding company is Talvivaara Sotkamo Ltd, which is 84% owned by TMC and 16% by Outokumpu Oyj ("Outokumpu"). The current Talvivaara mining concession covers an area of 61 km^2.

3.2 Deposit Geology

The Talvivaara deposit is divided into two polymetallic deposits hosted by a black schist: Kuusilampi and Kolmisoppi (**Error! Reference source not found.**). The main mineral assemblage in the black schist for both of the deposits is: quartz, biotite, muscovite, graphite and sulphides, with rutile, apatite, zircon, feldspar and garnets as common accessory minerals. Approximately 90% of the ore is hosted by black schist and the remainder by metacarbonate rocks, wackes and pelites. The main ore types can be divided mineralogically into three types: fine-grained disseminated ore, sulphide brecciated ore and metacarbonate rock associated ore.

The total sulphide content of the ore typically ranges between 15% and 25%. The sulphide assemblage is: pyrrhotite, pyrite, sphalerite, pentlandite, chalcopyrite and alabandite, with traces of galena, ullmannite and stannite. Pentlandite contains between 75%-88% of the contained nickel and pyrrhotite is the second most important mineral in terms of nickel content. Pyrite contains the main share (between 67-90%) of contained cobalt while chalcopyrite carries copper and sphalerite hosts zinc. Uranium occurs as thucholite, which is a mixture of hydrocarbons, uraninite and sulphides.

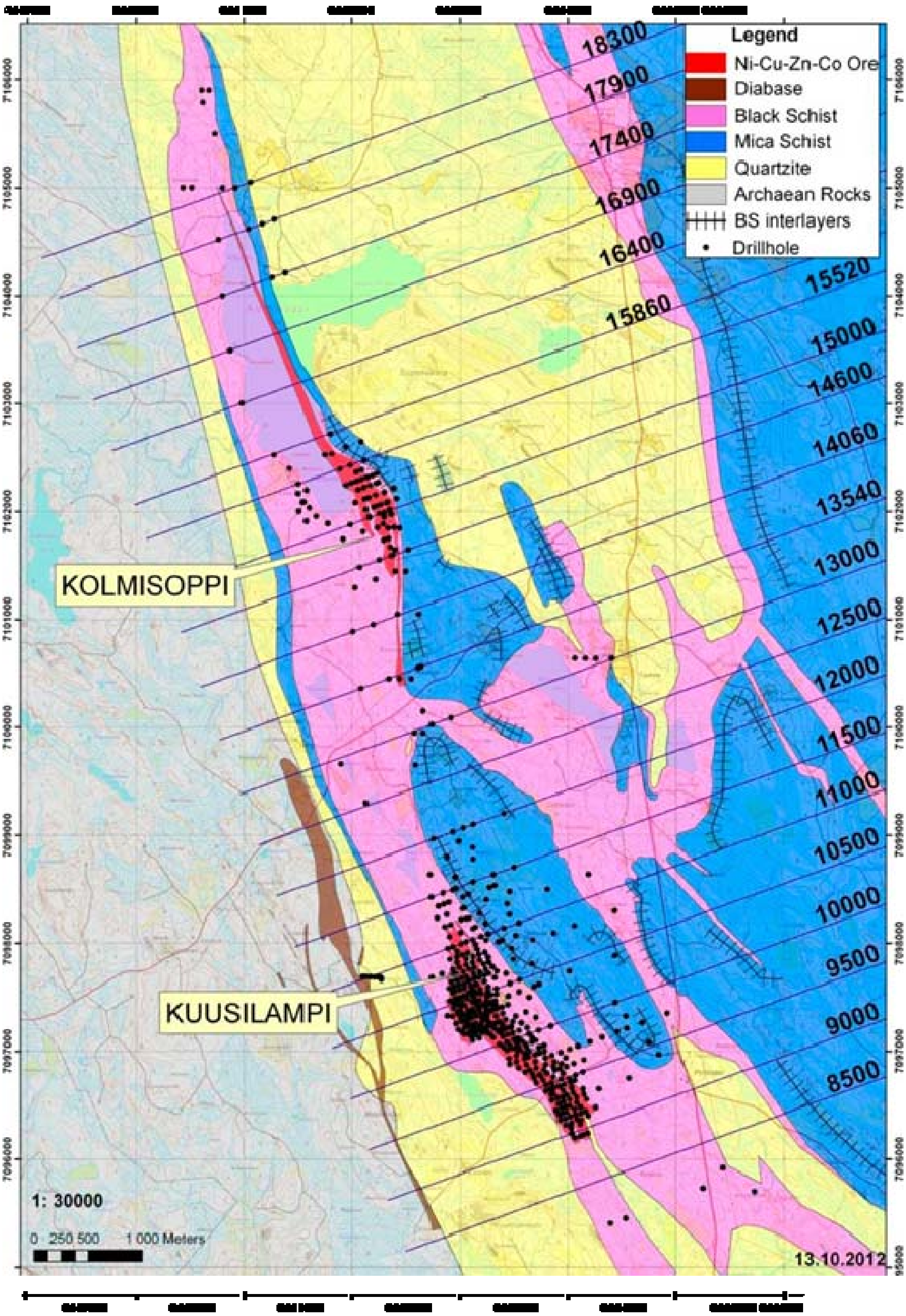


Figure 3-1: Talvivaara area geological map

3.3 Exploration

Exploration in the area of Talvivaara began in the 1960s. Kuusilampi and Kolmisoppi were identified through regional geological field work undertaken by the GTK between 1977 and 1983. Talvivaara was actively explored by Outokumpu between 1986 and the early 1990s. Subsequently, TMC has been engaged in exploration.

The mineralisation is obscured by glacial cover which limits the extent to which the surface expressions can be accurately mapped. The main component of mineralisation is a low-grade dissemination within a larger black schist unit. The limited distinction in physical properties between the mineralisation and host rocks reportedly limits the effectiveness of geophysical techniques. The Company has undertaken substantial exploration drilling to define the extents of mineralisation, ranging in depth from near surface to 700 m to 1,000 m below surface.

4 MINERAL RESOURCES

4.1 Mineral Resources

4.1.1 Introduction

SRK's review is principally focused on the Talvivaara Mineral Resource, as published by the Company on 28 November 2012 ("2012 MRE"). SRK has been provided with two Talvivaara resource estimation reports, numerous supporting documents (that include mineralogical reports, grade-tonnage tabulations and presentations), and electronic files that include:

- The drillhole database (2012 MRE);
- Geological wireframe models (2012 MRE);
- A classified block model (2012 MRE);
- A mined-out / topography surface (October 2012); and
- The base of overburden surface (March 2012).

Commonly wireframe models, constructed to define the limits mineralisation, are based on a cut-off grade, which in turn is used to constrain the potentially economic mineralisation in a geologically continuous form. Following block modelling and estimation the Mineral Resource is typically reported above an economic cut-off that relates to certain technical and economic parameters (for example metal prices and operating costs). For the avoidance of doubt, SRK notes that the cut-off grade pertaining to the construction of the geological model (0.07% Ni) will be referred to as the "modelling/model cut-off" and the economic cut-off as the "reporting cut-off". For example, the Company uses a modelling cut-off grade of 0.07% Ni and a reporting cut-off grade of 0.0% Ni.

4.1.2 Data Quality and Quantity

Exploration drilling dates back to 1977. The Company uses Oracle to house the database, which is managed externally by Oracle itself. In total, 143 km of drilling has been completed in the main deposit areas and the drillhole spacing ranges from approximately 40 x 40 m to 80 x 80 m to 200 x 200 m. SRK considers the database to be of sufficient quality and integrity to support the audited Mineral Resource statement given below.

4.2 Uranium

No material concerns were noted in respect of the uranium grades, given the relatively minor revenue contribution. SRK recommends that the Company seeks to increase the size and coverage of the uranium assay database. Notwithstanding this, SRK notes that the uranium grade distribution is consistent and represents a widespread enrichment.

4.3 Geological Modelling

SRK considers the geological model to be robust and based on a good understanding of the regional and deposit-scale geology. The mineralisation model boundary corresponds to a natural break in the nickel grade distribution and broadly coincides with the MCOG, based on current technical-economic parameters.

4.4 Mineral Resource Estimation

4.4.1 Tonnage Estimation

Currently, tonnages are estimated by the application of an average density. A fixed density of 2.91 g/cm^3 is applied to mineralisation at Kuusilampi and 2.97 g/cm^3 is used at Kolmisoppi. These values represent the average of the recent and historical density data. SRK considers the application of these density values to be reasonable.

4.4.2 Grade Estimation

The Company estimates the grades of Al, C, Ca, Co, Cu, Fe, K, Mg, Mn, Na, Ni, S, U and Zn into the block model using an inverse distance squared algorithm. The search neighbourhood is spherical and extends 1,000 x 1,000 x 1,000 m, utilising a minimum number of samples of three and a maximum of six. No de-clustering methods are used for block estimation. While the current grade estimation practices appear to introduce a conditional bias in the estimation at higher nickel cut-off grades due to the introduction of a localised search neighbourhood, the largely un-selective nature of the mine schedule mitigates the risk introduced by this.

4.4.3 Classification

Talvivaara reports Mineral Resources in accordance with the terms and guidelines of the JORC Code. The principal distinction made by the Company in allocating the resource to the different classification categories is drillhole spacing and geological understanding. Broadly, Measured Mineral Resources are supported by a drillhole spacing of 40 x 40 m; Indicated Mineral Resources are supported by a drillhole spacing of up to 80 x 80 m and Inferred Mineral Resources are supported by an approximate maximum spacing of 600 – 700 m, which reduces to 200 m – 400 m in certain areas of both Kuusilampi and Kolmisoppi. SRK has reviewed the Company's classification methodology and considers it to be reasonable. The deposit geology is very well understood and constrained. Additionally, there is a high degree of grade consistency and excellent geological continuity. SRK's assessment of the nickel variography for Kuusilampi suggests along-strike ranges of approximately 650 m and down-dip ranges in the order of 330 m, which validate the drillhole spacing guidelines considered for classification.

4.4.4 Economic potential

Historically, Talvivaara has not constrained the reported Mineral Resource to an optimised pit shell. SRK recommends that in future the Company constrains its reported Mineral Resources to an optimised pit shell, in line with the process shown below, in order to satisfy the JORC requirement to limit the Mineral Resource to material with 'reasonable prospects for eventual economic extraction'.

As part of its audit, SRK has undertaken a pit optimisation analysis to constrain and report its audited Mineral Resource, which reflects:

- all Measured, Indicated and Inferred Mineral Resources;
- the latest available operating cost and modifying parameters for each deposit (where applicable); and
- a price premium to the current long-term price which is typically 30% higher than the latest consensus market forecast.

The nickel price assumption used for the reporting of Mineral Resources is US$24,700/t, which represents a 30% premium on the long-term commodity price of US$19,000/t. Based on the parameters detailed above, the optimised pit shells encompass 93% of the total Kuusilampi in situ tonnage and 92% of the total Kolmisoppi in situ tonnage.

4.5 Mineral Resource Statement

SRK's audited Mineral Resource statement as at 28 November 2012 (Table 4-1) comprises 1.9 Bt, grading 0.23% Ni, 172 ppm Co, 0.13% Cu, 0.50% Zn and 17 ppm U, reflecting an overall nickel equivalent grade of 0.27% Ni. In total, 51% of the combined Mineral Resource tonnage is hosted by Kuusilampi, which contains 63% of the overall Measured tonnage and 73% of the Indicated tonnage.

The combined Mineral Resource contains 4.3 Mt of nickel metal and 5.2 Mt of nickel equivalent metal, of which 2.97 Mt of nickel metal are contained in the Measured and Indicated categories, 68% of which is hosted by Kuusilampi.

Table 4-1: 28 November 2012 SRK Mineral Resource Statement (1)

4.6 Classification	4.7 Tonnes (Mt)	4.8 Nickel (%Ni)	4.9 Cobalt (ppm Co)	4.10 Copper (%Cu)	4.11 Zinc (%Zn)	4.12 Uranium (ppm U)	4.13 Nickel Equivalent (%Ni)
Kuusilampi							
Measured	315.8	0.23	173	0.13	0.50	16	0.28
Indicated	569.0	0.23	166	0.13	0.51	17	0.27
Measured + Indicated	**884.8**	**0.23**	**169**	**0.13**	**0.51**	**17**	**0.28**
Inferred	84.2	0.16	143	0.10	0.45	11	0.20
Total	**969.0**	0.22	166	0.13	0.50	16	0.27
Kolmisoppi							
Measured	188.3	0.23	183	0.13	0.49	17	0.28
Indicated	214.2	0.24	193	0.14	0.51	17	0.29
Measured + Indicated	**402.5**	**0.24**	**189**	**0.13**	**0.50**	**17**	**0.29**
Inferred	539.5	0.22	170	0.13	0.49	18	0.27
Total	**942.0**	0.23	178	0.13	0.50	18	0.28
Mineral Resources							
Measured	504.1	0.23	177	0.13	0.50	17	0.28
Indicated	783.2	0.23	173	0.13	0.51	17	0.28
Measured + Indicated	**1,287.3**	**0.23**	**175**	**0.13**	**0.50**	**17**	**0.28**
Inferred	623.8	0.21	166	0.12	0.49	17	0.26
Total	**1,911.0**	**0.23**	**172**	**0.13**	**0.50**	**17**	**0.27**

(1) Mineral Resources are constrained by an optimised pit shell corresponding to a nickel price of US$24,700/t.

4.14 Grade-tonnage analysis

Figure 4-1 and Figure 4-2 show the grade-tonnage distribution for each classification and the combined Mineral Resource for Kuusilampi and Kolmisoppi. The Mineral Resource, presented herein is reported at the lowest cut-off (0.05% Ni), which represents all of the blocks constrained by the optimised pit shell. The tonnage is relatively insensitive to increasing to cut-off grades and demonstrates almost no sensitivity below a cut-off of 0.09% Ni. The grade profile is extremely consistent across all categories, with the slight exception of the Kuusilampi Inferred Mineral Resource, below a cut-off of 0.17% Ni. The MCOG is indicated on the grade-tonnage curves below for purposes of comparison and completeness, whilst the Mineral Resource is reported at a 0.05% Ni cut-off.

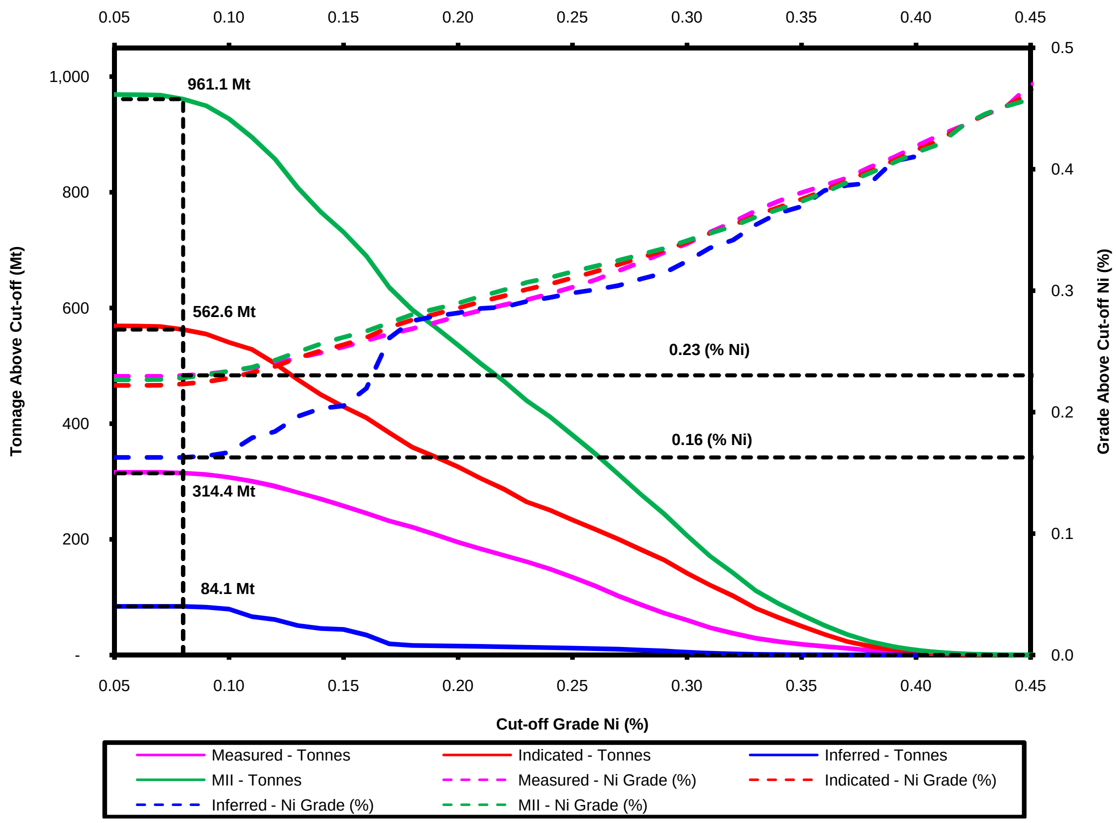


Figure 4-1: Kuusilampi grade-tonnage curves

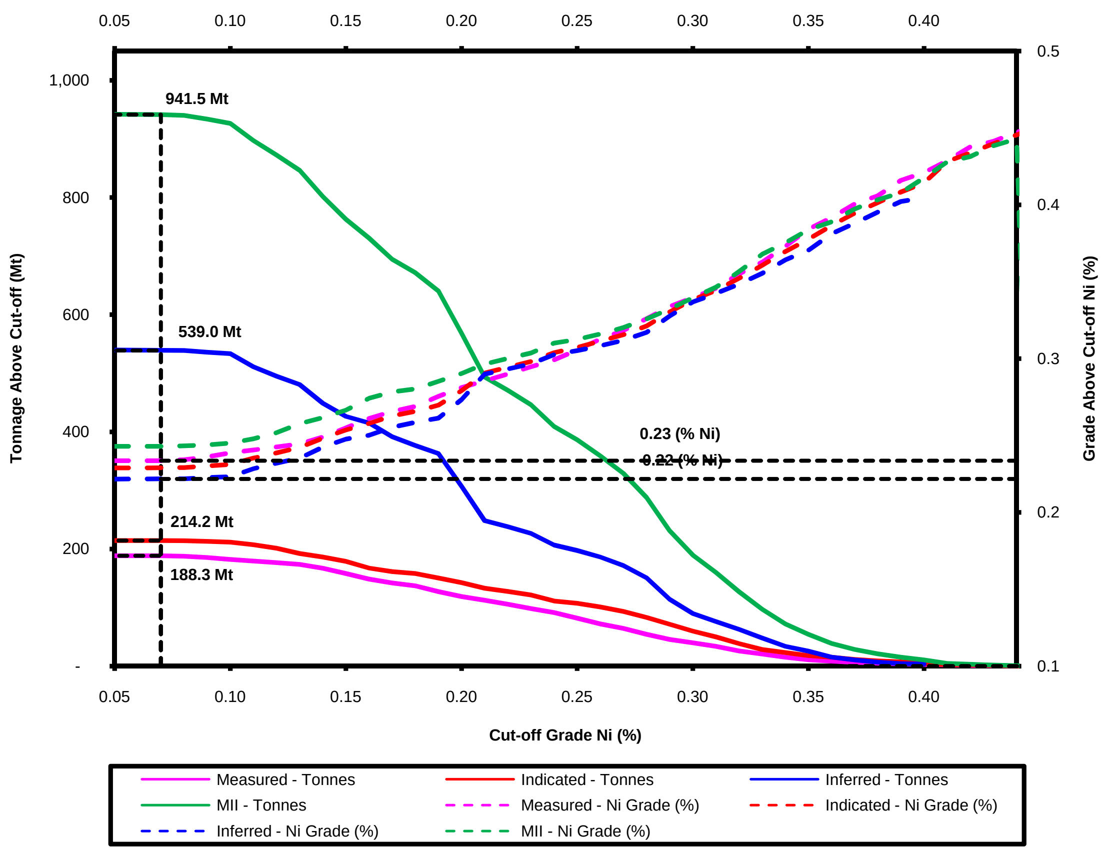


Figure 4-2: Kolmisoppi grade-tonnage curves

4.15 Grade Control and Reconciliation

SRK strongly recommends that the Company installs systems and processes to closely reconcile mine production against the geological model and mill production. Currently, reconciliation is related to tonnages and no consideration is given to the mined grades. The issue is particularly pertinent given:

- the lack of grade control drilling and the non-systematic sampling of blastholes
- the limited ability to distinguish mineralised and un-mineralised rock, due to the similarity in visual appearance; and
- the considerable elapsed time between mine production and metal recovery.

5 PRODUCTION SCHEDULE

In its annual reports for 2010, 2011 and 2012 TMC did not report Ore Reserves for the Kuusilampi and Kolmisoppi deposits.

The strategic study performed by SRK in 2010 / 2011 used the 2010 resource model with updated project parameters to evaluate alternative life-of-mine plan scenarios for the two deposits. For the 2010 Base Case model the “final” optimised pit shells were then engineered and scheduled. Estimates of tonnes and grade were then reported by SRK from these engineered pits and these were used to provide the basis of a production schedule.

As part of this review, SRK has performed a pit optimisation analysis using the updated 2012 resource model with updated project parameters as at January 2013. Using the same methodology for selecting the “final” optimised pit shells, for a revenue factor of 0.79 (USD 15,000/t Ni price), updated estimates of tonnes and grade have been reported by SRK from these which have then been compared with the 2011 study.

It is noted that the tonnage and grade estimates so generated for both Kuusilampi (694 Mt) and Kolmisoppi (298 Mt) have significantly increased for the same Revenue Factor / nickel prices from the 2011 study. However, the waste stripping tonnages have also increased for both deposits.

6 MINING

6.1 Introduction

Ore mining from Kuusilampi pit was stopped in August 2012 due to the prevailing water balance issues and the necessity to store excess water in the open pit, and the waste mining operation was stopped in January 2013 as there was considered to be limited need for waste mining during the ore production stoppage. Talvivaara has prepared a 5-year mining production schedule that restarts the waste and ore mining at Kuusilampi in June / July 2013.

The 5-year production schedule was generally based on the waste stripping schedule and engineered pit designs that were prepared by SRK in 2011, as part of a strategic assessment of the life-of-mine (“LoM”) planned at Talvivaara.

6.2 Pit Optimisation

As part of this review, SRK considered the impact of the updated resource model, together with the updated project performance parameters as at January 2013. SRK re-ran pit optimisations for Measured and Indicated resources (“MI”) and then a further optimisation including Inferred resources (“MII”).

The key differences between the 2011 and 2013 studies are that the resources at Kuusilampi and Kolmisoppi have materially increased by converting Inferred to Measured and Indicated resources, as well as by demonstrating additional strike and dip extensions to the deposits.

Table 6-1 shows a comparison of the 2013 optimisation results for Kuusilampi and Kolmisoppi with those from the 2011 study.

Table 6-1: Comparison of 2013 optimisations with 2011 study

Description	Units	For Same RF - Mineable Resources			For 2011 Tonnages	
		2013 MI+U	2011 MI+U	% Change	2013 MI+U	% Change
Kuusilampi						
Revenue Factor ("RF")		0.79	0.80		0.71	
Ni Price	**USD/t**	15,000	16,000		13,500	
Ore	**Mt**	694	496	140%	501	101%
Grade	**Ni ppm**	2,363	2,363	100%	2,457	104%
Waste	**Mt**	1,036	417	248%	631	151%
Strip Ratio	**tw : to**	1.49	0.84		1.26	
Kolmisoppi						
Revenue Factor ("RF")		0.79	0.80		0.68	
Ni Price	**USD/t**	15,000	16,000		13,000	
Ore	**Mt**	298	197	152%	199	101%
Grade	**Ni ppm**	2,440	2,397	102%	2,441	102%
Waste	**Mt**	483	133	363%	176	132%
Strip Ratio	**tw : to**	1.62	0.68		0.89	
Total						
Revenue Factor ("RF")		0.79	0.80		~ 0.70	
Ni Price	**USD/t**	15,000	16,000		~ 13300	
Ore	**Mt**	992	693	143%	700	101%
Grade	**Ni ppm**	2,387	2,373	101%	2,452	103%
Waste	**Mt**	1,520	550	276%	807	147%
Strip Ratio	**tw : to**	1.53	0.79		1.15	

It is noted that the resource tonnage and grade falling within these optimize pits for Kuusilampi (694 Mt) and Kolmisoppi (298 Mt) have significantly increased assuming the same Revenue Factor ("RF") / nickel prices from the 2011 study. However, the waste stripping requirements have also increased for both deposits.

Selecting the equivalent 2013 pit shells that match the 2011 mineable resource tonnages, shows reduced overall strip ratios for the same contained tonnes and grade, but these are still higher than were reported in 2011. This is in part due to the increased project costs with reduced performance that have been used for the 2013 optimisations. This has resulted in the contained tonnage being reported at higher cut-off grades, with reduction in ore tonnage and increased waste tonnages.

Figure 6-1 shows the Kuusilampi 2011 engineered pit (red) with the RF 0.68 (green - USD 13,000/t) and RF 0.71 (blue - USD 13,500/t) optimised pit shells for comparison.

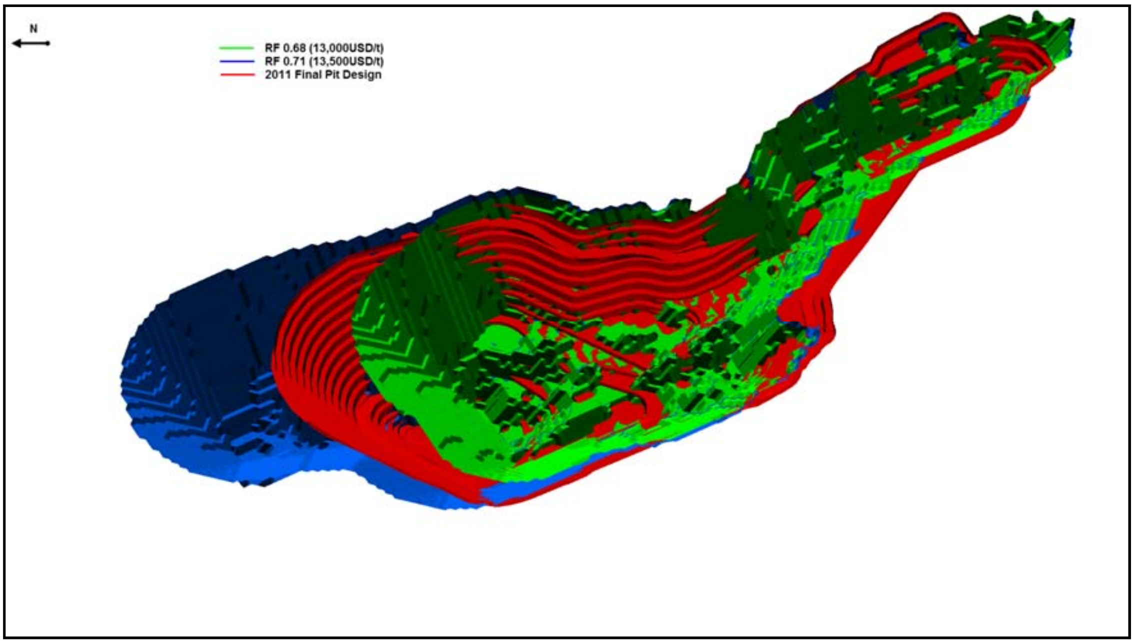


Figure 6-1: 2011 Engineered "Final" Pit with Intermediate Cut 1 and Cut 2

It is noted that the size and extent of the pit shells are very sensitive to metal prices at this point.

Figure 6-2 shows the 2011 "final" pit (blue), with Cut 1 (red) and Cut 2 (green) that were designed for the 2011 study, and have been generally used to guide the 5-year schedule.

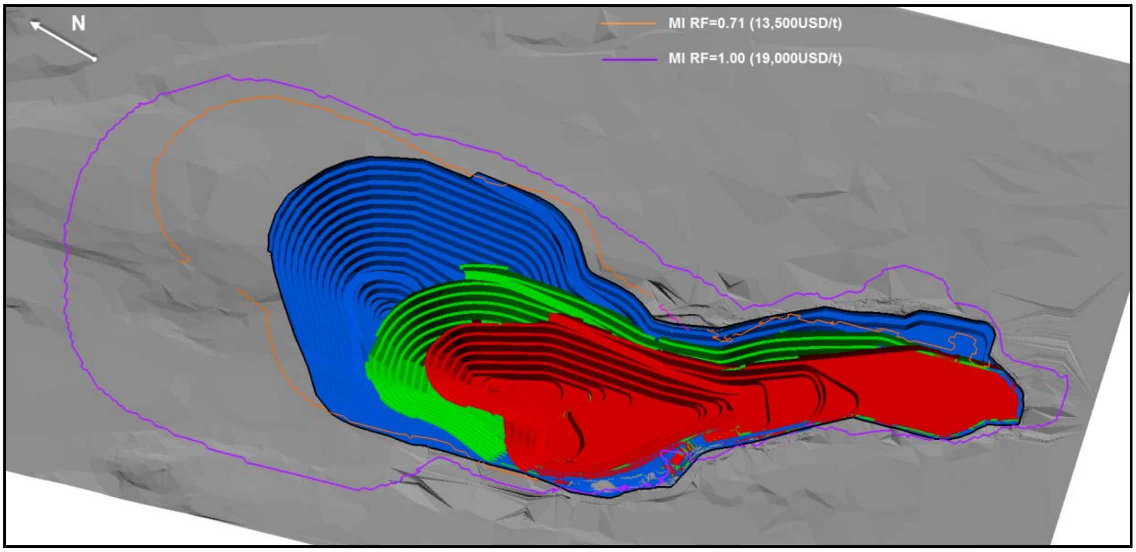


Figure 6-2: 2011 Engineered "Final" Pit with intermediate Cut 1 and Cut 2

Talvivaara has modified the "final" pit design at the south end of the pit by moving the pit limit approximately 50 m to the north. This may result in a loss of 13.9 Mt of ore (10.9 Mt of waste) as the 2013 optimisations have shown south pit limits that confirm the original pit design is still appropriate.

6.3 5-year Mining Schedule

A comparison between the 2013 and 2011 mining production schedule is shown in Table 6-2.

Table 6-2: Comparison of 2013 and 2011 5-year Mining Schedules

	Unit	Totals	2011	2012	2013	2014	2015	2016	2017		
2011 5-year Schedule - v6b		**2011-2017**									
Cut 1											
Ore	Mt	**100.60**	22.65	22.98	21.57	18.16	15.25				
Waste	Mt	**38.88**	15.01	15.09	5.15	2.56	1.07				
Ni Metal	Mt	**0.23**	0.051	0.051	0.049	0.042	0.035				
Ni % (RoM)	Ni ppm	**2,267**	2,240	2,205	2,287	2,316	2,316				
Strip Ratio	tw : to	**0.39**	0.66	0.66	0.24	0.14	0.07				
Cut 2											
Ore	Mt	**13.98**	-	0.03	0.69	5.04	8.21				
Waste	Mt	**36.30**	-	0.01	9.97	12.72	13.61				
Ni Metal	Mt	**0.02**	-	0.000	0.001	0.008	0.015				
Ni % (RoM)	Ni ppm	**1,744**		1,368	1,483	1,631	1,836				
Strip Ratio	tw : to	**2.60**		0.27	14.41	2.52	1.66				
Total											**2011-12 Planned**
Ore	Mt	**114.57**	22.65	23.01	22.26	23.20	23.46				**45.66**
Waste	Mt	**75.18**	15.01	15.10	15.12	15.28	14.67				**30.10**
Ni Metal	Mt	**0.25**	0.05	0.05	0.05	0.05	0.05				**0.10**
Ni % (RoM)	Ni ppm	**2,204**	2,240	2,204	2,262	2,167	2,148				**2,222**
Strip Ratio	tw : to	**0.66**	0.66	0.66	0.68	0.66	0.63				**0.66**
	Unit	**Totals 2011-2017**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**5-year 2013-2017**	**2011-12**
2013 5-year Schedule			**Actual Mined**								**Act Mined**
Ore	Mt	**119.73**	10.85	8.70	9.19	18.00	21.00	26.00	26.00	**100.19**	**19.55**
Waste	Mt	**93.27**	13.96	4.64	6.91	13.00	15.75	19.50	19.50	**74.66**	**18.60**
Ni Metal	Mt	**0.276**	0.023	0.019	0.023	0.044	0.048	0.060	0.060	**0.235**	**0.04**
Ni % (RoM)	Ni ppm	**2,303**	2,081	2,140	2,467	2,444	2,300	2,300	2,300	**2,341**	**2,107**
Strip Ratio	tw : to	**0.78**	1.29	0.53	0.75	0.72	0.75	0.75	0.75	**0.75**	**0.95**

P:\U5430 Project Iniesta\Project\Mining\For Report\[Schedules_Kuus__5 year-v1.xlsx]Compare 5 year plans

It is noted that:

- For the 2-year period 2011 / 2012, the 2011 plan showed 45.6 Mt ore being mined at a strip ratio of 0.66 whereas only 19.5 Mt of ore was actually mined at a higher strip ratio of 0.95. The 2013 plan stripping rate is more conservative than the 2011 plan. Provided that the ore delivered from the pit matches that predicted by the resource model, the 2013 planned stripping tonnages should be sufficient to maintain the required ore exposure.
- For the 5-year period, the 2011 plan showed a total of 114.5 Mt of ore being mined at a strip ratio of 0.66, whereas the tonnage actually mined during 2011-12 combined with the 2013 plan shows 119.7 Mt of ore being mined at a strip ratio of 0.78
- The 2011 plan mined an average grade over 5 years of 2,204 ppm Ni, whereas the 2013 plan is showing a higher planned grade of 2,341 ppm Ni for the next 5 years. This might be caused by Talvivaara applying a higher cut-off grade ("CoG") than 700 ppm Ni.

SRK confirms that the in-situ tonnage and grade of ore and the waste tonnages reported by the 2013 resource model for the planned 2013 mining areas, are very similar.

The tonnages within the Cut 1 and Cut 2 pits as reported from the 2013 resource model are also very similar. These are shown in Table 6-3.

Table 6-3: Cut 1, Cut 2 and "final" Pit Quantities reported by 2013 Model (In-Situ)

	Total	Waste	Ore	Strip Ratio	Ni	Zn	Cu	Co	U
	Mt	Mt	Mt	tw:to	ppm	ppm	ppm	Ppm	ppm
Cut 1	139.8	38.1	101.6	0.38	2,518	5,201	1,399	194.8	16.1
Cut 2	234.7	95.7	139.0	0.69	2,348	5,146	1,329	180.6	18.0
Final Pit Total	883.9	442.0	441.9	1.00	2,386	5,170	1,366	174.5	17.0

The resource model has not adversely affected the tonnages required for short term planning. The in-situ tonnages remaining in Cut 1 and Cut 2 are 240 Mt of ore for 133 Mt of waste for an overall strip ratio of 0.56 t_{waste} : t_{ore}.

The planned rate of waste stripping proposed by Talvivaara should be sufficient to maintain the required ore production for 2013 – 2017, for the assumption that the operational cut-off grade remains at 700 ppm Ni.

6.4 Mining Equipment

The mining equipment fleet at Talvivaara comprises 8 haul trucks (170t – Hitachi EH3500), 2 excavator shovels (Hitachi 3600), 1 Front-end Loader (FEL) (WA1200) and 4 Drills (Sandvik DP1500 and DX800). This equipment (excluding the FEL) was purchased under 5-year lease finance terms, and is being maintained under Maintenance and Repair Contracts ("MARC") with respective suppliers. The performance of the equipment under the MARC has generally been satisfactory.

The mining equipment fleets are still in good condition as preventive maintenance schedules and component change outs have been performed as required.

With the mining operations currently stopped, Talvivaara has initiated negotiations with the MARC suppliers for the continuing basis for these contracts. Talvivaara is also considering the option of taking over the equipment maintenance itself. The outcomes were not determined at the time of this review.

The drilling has been complemented by 2 additional blasthole drill rigs provided by contractors. The soft overburden has been removed by contractors with Talvivaara mining the remaining hard rock. The explosives and blasting is being performed by a contractor. All ancillary equipment (road graders, dozers, water bowser) are provided by contractors.

The mining fleet has historically been under-utilised due to the lower than planned mining tonnages required by the plant. The fleets are therefore still relatively young and it is unlikely that replacement of any mining units will be required during the next 5-year period.

Talvivaara has committed to the purchase of additional items in 2013, namely the delivery of another 170 t haul truck for delivery in June; with a 2nd haul truck due for delivery in October / November. Evidently these orders cannot be cancelled or deferred.

Further mining equipment purchases have been planned during the 5-year forecast period. The estimation of these purchases was made in accordance with the planned production schedule and assessment of the required mining tonnages, haulage profiles and estimated cycle times. The planned additional equipment purchases have been included in Talvivaara's financial model.

6.5 Waste Dumping

Construction of the secondary leach pad is estimated to require another 3 years of waste mining at the planned production rates. Thereafter the stand alone waste dump will be required, and the waste haulages will then be considerably reduced.

An area has been reserved for placing the waste dump, as defined in the original project feasibility study. This area and dump design have been specified in the project permitting.

However, the pit limits have significantly changed and the tonnages of waste that will require to be dumped have materially increased. As there are sulphides present in the waste rock, these waste dumps will need to be engineered and sealed to manage the seepage water that will be generated from these dumps by precipitation and drainage of wet materials placed on the dumps.

Talvivaara should investigate alternative locations and footprint areas for waste storage, and optimise the placing and construction sequence for dumping waste materials. This is not a critical issue at present, as these dump areas will only be required in 2 to 3 years' time.

6.6 Modifying Factors

The modifying factors that are used for converting the Mineral Resource to estimates of mined tonnes and grades comprises geological and mining loss/gain of ore and the impact of dilution of the ore by addition of waste materials during mining.

The modifying factors for the Talvivaara project were defined in the original feasibility study as:

- Loss of ore2.0%
- Dilution of ore 2.0% but including waste with a mineralised grade. The diluting grades of the waste rocks are applied for each element, in addition to nickel.

Talvivaara does not perform any independent estimate of the grades of Run-of-Mine ("RoM") ore that have actually been sent from the pit to the crusher(s). The estimate of mined grade is made by using the data from blast blocks / survey / grade control from blast hole sampling (to define the ore / waste contacts) and then applying the block grades from the resource model.

Without additional sampling of the crushed ore feed to the primary heap, effective reconciliation between the grades in the resource model and the effect of mining recovery / dilution cannot be performed. The modifying factors that have been derived for the feasibility study cannot be verified from the production statistics.

6.7 Cut-off grade

An in-situ cut-off grade ("CoG") of 700 ppm Ni is being used at Talvivaara to differentiate between ore and waste for defining ore in the resource model, but also for defining the ore / waste mining limit in the pit.

The Base Case assumptions for the 2013 optimisation were for a Ni metal price of USD 19,000/t and Ni recovery of 89%. The marginal cut-off grade that has been derived by the Whittle optimisation software based on these parameters was 1,151 ppm Ni (in-situ) for the Kuusilampi MI case. This cut-off grade was used for reporting the optimised pit mineable resources, and is significantly higher than 700 ppm Ni.

Table 6-4 shows the calculation and sensitivity of the marginal CoG for a -30% to +12% change in Ni overall recovery and Ni metal price.

Table 6-4: Marginal CoG based on Ni Price and Ni Recovery

	Ni Recovery	**63%**	**71%**	**80%**	**89%**	**98%**	**100%**
Ni Price (USD/t Ni)	**% Change**	**-30%**	**-20%**	**-10%**	**0%**	**10%**	**12%**
13,300	**-30%**	2,351	2,057	1,829	1,646	1,496	1,470
15,200	**-20%**	2,057	1,800	1,600	1,440	1,309	1,286
17,100	**-10%**	1,828	1,599	1,422	1,279	1,163	1,142
19,000	**0%**	1,645	1,439	1,279	**1,151**	1,047	1,028
20,900	**10%**	1,495	1,308	1,163	1,047	951	934
21,279	**12%**	1,468	1,285	1,142	1,028	934	918

The tonnage v grade curves for the 442 Mt of mineable resources reported by the "final" 2011 pit are shown in Figure 6-3.

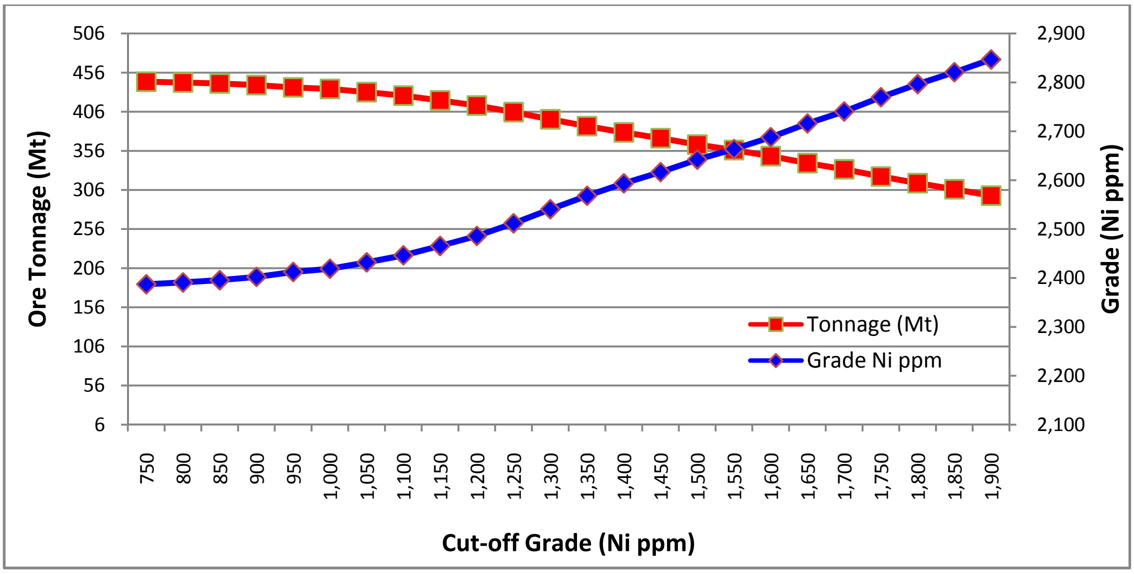


Figure 6-3: Tonnage v Grade – In-situ Mineable Resources for 2011 "final" pit

The impact on the overall ore / waste tonnages and resulting strip ratio for the "final" pit tonnages are shown in Figure 6-4.

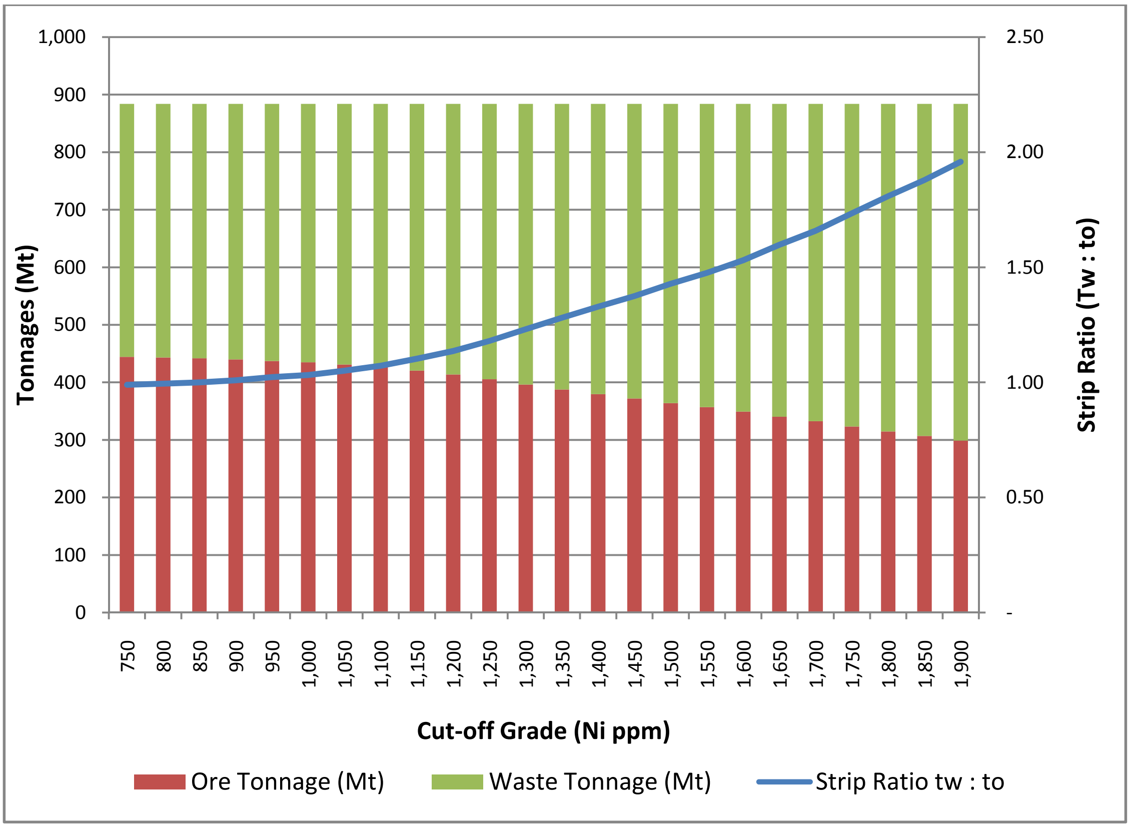


Figure 6-4: Impact of CoG on Tonnage of Ore, Waste and Strip Ratio ("final" pit)

6.8 Mining Conclusions and Recommendations

6.8.1 Conclusions

The objective for this mining review was to verify the 5-year mining production schedule for Kuusilampi as generated for 2013-2017 by Talvivaara. This production schedule was not supported by physical mining face positions determined beyond the end of 2013. The annual ore tonnages had been forecast to generate a long term target of 50,000 tpa of Nickel and had been based on an estimated annual RoM tonnage and average RoM grade to deliver this. The annual waste stripping had been forecast based on an average stripping ratio of 0.75 t_w : t_o. The Talvivaara 5-year plan had generally been guided by the previous 5–year schedule, prepared by SRK in 2010 / 2011 as part of a strategic life-of-mine assessment. The 2011 5-year plan suggested that in the short term, a stripping ratio of 0.66 t_w : t_o was required to deliver 50,000 tpa of Ni, based on the project assumptions as at 2011.

Meanwhile, the recent exploration drilling programme has significantly upgraded and extended the resources at both Kuusilampi and Kolmisoppi deposits. As part of this review, SRK has re-run the pit optimisations, using updated 2013 project parameters with the updated resource models. This has confirmed that the resource available for mining has significantly increased for both Kuusilampi and Kolmisoppi. SRK also confirms that the results from the 2011 strategic and 5-year study are still generally appropriate for the immediate short term mine schedule at Kuusilampi.

The 2013 project parameters have negatively impacted on the calculation of marginal cut-off grade. Talvivaara has been operating to a CoG of 700 ppm to define ore and waste boundaries for the mining contacts. Talvivaara should review this and apply a higher Ni or Ni equivalent CoG that at least exceeds the 2013 marginal (milling) CoG of 1,151 ppm Ni. This will have an impact on the tonnages of ore, waste and stripping ratio that have been planned in Talvivaara's 5-year production schedule.

The mining equipment fleet at Talvivaara is still relatively young and is generally in good condition of maintenance under various MARC agreements. These are shortly due to expire and Talvivaara has started negotiations for their renewal or alternative. Additional units have been planned for delivery before the end of 2013 and during the 2014-2017 period. The mining fleet requirement has been estimated by Talvivaara assuming that the secondary pad will continue to be constructed using mine waste for another 3 years. Then the mine waste dump construction will be started for the mining waste. The planned mining fleet should be sufficient to support the planned ore and waste mining tonnages.

When mining restarts in June / July 2013, the majority of the ore production for 2013 has been planned from the 180 m bench. The sump is currently on this bench and contains approximately 1.5 – 2.0 Mm^3 of contaminated water. This needs to be pumped from the pit before June 2013, to enable mining to continue in dry conditions in 2013, and to enable the sump to be re-established on the 165 m bench (and / or below) for the 2013 / 2014 period.

6.8.2 Recommendations

The mining recommendations from this review are:

- **Cut-off Grade**: Talvivaara should review and determine the appropriate operational CoG that ensures the economic crushing and processing of ore. This will increase the RoM grade of ore crushed.
- **Mine Scheduling software**: Talvivaara should acquire an appropriate mining software package to facilitate the development and evaluation of alternative mining production schedules.

- **Modification Factors**: Talvivaara should implement additional sampling and perform more monthly / annual reconciliation between the performances of the resource model, RoM ore grades as mined, grades placed on the secondary leach pads and the final metal production. The mining modification factors and project performance parameters should be verified.
- **2013 "Final" pit**: Talvivaara should review the 2013 "final" pit design after considering the 2013 optimisation results. Specifically the Cut 1 and Cut 2 engineered designs and scheduling should be reviewed and re-evaluated, incorporating any changes to the CoG.
- **Mine Waste Dump:** Talvivaara should review the planning for the location, design, footprint and construction for the mine waste dump that will be started in approximately 3 years' time.
- **2013 Strategic LoM Plan:** Talvivaara should update the strategic planning for the long term development of the Kuusilampi and Kolmisoppi deposits.

7 METALLURGY AND PROCESS DESIGN

7.1 Overview/Introduction

The processing facilities at Talvivaara include:

- Materials Handling incorporating primary crushing, crushed ore stockpiling, three stages of fine crushing and screening, agglomeration, primary ore stacking, primary heap reclamation equipment and conveyors, and secondary heap stacking;
- Primary and Secondary Bio-Heap Leaching in acidic media including solution management and air distribution to the heaps;
- A metals recovery plant utilising sequential metal sulphide precipitation using pH adjustment and hydrogen sulfide gas (H_2S). Three precipitated products are produced, a nickel cobalt sulphide, zinc sulphide and copper sulphide. The precipitates are thickened and filtered to produce transportable solids;
- A railway for importing bulk reagents and materials, and for exporting the metals products;
- Waste treatment and storage ponds (gypsum ponds); and
- Reagent and utility systems to support the operation.

Recently a uranium recovery plant has been installed and should be commissioned during 2013.

Based on the economic model (up to 2020) nickel, zinc and copper represent 78.5% and 8.3% and 7.1% of the overall revenue stream, with the balance split almost equally between cobalt and uranium.

The target nickel production is 50 kt per year contained metal.

7.2 MINERALOGY

The Talvivaara polymetallic Ni-Cu-Co-Zn deposit consists of two different orebodies, Kuusilampi and Kolmisoppi.

The mineralogy of the ore bodies appears to be well understood and in general terms is consistent throughout the two ore bodies. The economic metals are contained in sulphides.

The sulphidic ores at the Talvivaara deposit are hosted by two different lithologies. The predominant rock type is black schist (90%) and the subordinate type comprises metacarbonate rocks, wackes and pelites.

Typically pyrrhotite and pyrite are the main sulphides, with sphalerite, alabandite, pentlandite and chalcopyrite as minor components. Graphite often occurs as fine grained dissemination inside sulphides and as tight intergrowths, especially with pyrrhotite.

Nickel is the predominant economic metal and most of the nickel, 75% to 88%, is contained in pentlandite; about 11% to 24% in pyrrhotite; and 0.7% to 1.4% in pyrite. Zinc is the second important economic metal and is generally contained in sphalerite.

7.3 Ore grades

Overall the metal grades of the Talvivaara ore do not vary significantly. Typically the mined grades are:

- %Ni – Maximum 0.275%, Minimum 0.219%, Average 0.235%;
- %Zn - Maximum 0.570%, Minimum 0.47%, Average 0.509%;
- %Co - Maximum 0.022%, Minimum 0.017%, Average 0.018%; and
- %Cu - Maximum 0.150%, Minimum 0.122%, Average 0.132%.

7.4 Metallurgical Testwork

A significant amount of laboratory and column testwork has been performed on ores from the Talvivaara deposit.

The main testwork programs of significance to the current operation are the pilot heap leach operated in 2005 to 2008 and the metals recovery pilot testing performed at OMG in 2006 to 2007.

The representative sample for the pilot tests was taken from four different locations representing the overall Kuusilampi deposit. The metals extractions from the pilot heaps, for primary leaching and partial secondary leaching, are given in Table 7-1.

Table 7-1: Pilot Heap Leach Metal Extraction

	Metal Extractions			
	Ni %	Zn %	Cu %	Co %
Primary leaching (5.9.05 to 19.02.07)	81.2	74.1	3.5	10.1
Primary and secondary leaching to Nov 2008	>98	>98	21.9	35.1

Cu and Co extraction was still increasing when the pilot heap operations were halted in November 2008.

The target metal extractions in the Bankable Feasibility Study (BFS) were Ni 85%, Zn 80%, Cu 50%, and Co 50%. The primary heap leaching was scheduled for 1.5 years and secondary leaching 3.5 years. Most of the Ni and Zn was expected to be extracted during primary leaching and in excess of 85% of the Cu and Co was expected to be extracted in the secondary heap.

While the Ni and Zn extractions achieved from the pilot heaps were higher than included in the BFS, the extractions of Cu and Co were lower. Following the conclusion of the pilot heap and evaluation of the data, Talvivaara revised its metal extraction predictions in its project modeling to:

- Ni leaching % = 92% in 36 months;
- Zn leaching % = 92% in 41 months;
- Cu leaching % = 30% in 48 months; and
- Co leaching % = 45% in 48 months.

Metals recovery testwork was performed on leach solutions from the pilot heaps at OMG in 2007. A pilot plant was built to test metals precipitation, using H_2S gas, from these leach solutions. In addition, thickening and filtration tests were performed. In general, no significant issues were identified with the precipitation process or the product quality. The OMG pilot plant testwork confirmed the data used for the feasibility study and was the basis for the original design including the process flowsheet and process conditions, residence times, thickening and filtration data, CuS, ZnS and NiCoS recoveries and product analyses, reagent consumptions and effluent analyses.

7.5 Health and Safety

On 15 March 2012, there was a fatal incident involving an employee at the Talvivaara mine.. An operator was killed as a result of H_2S gas inhalation. During the investigations into the incident the plant was shut down by the authorities. Following the investigations the plant was restarted with revised operating and safety procedures.

7.6 Process Plant

Processing comprises the following steps:

Materials handling including primary crushing and stockpiling; three stages of fine crushing and screening; agglomeration and stacking the ore on the primary leaching pads; primary leached ore reclamation and crushing; and secondary stacking of the ore on the secondary leaching pad.

Bio-heap leaching of the ore is performed in two stages: primary leaching on an on-off pad and secondary leaching on a permanent pad. The leaching is conducted in acidic solution. The leaching pads are fully lined to retain all process solutions and to protect the environment.

The metal rich solution from leaching is processed in a metals recovery plant which utilises H_2S gas to precipitate the metals as sulphides: a mixed NiCo sulphide, Zn sulphide and Cu sulphide. Most of the solution from the plant is recycled back to the leaching area, a portion of which is first treated for Fe and Al removal, and another portion further treated, for Mn and Mg removal.

The products are thickened, filtered, and transported to the end users by rail.

Waste solids, predominantly gypsum and Al and Fe hydroxides, are precipitated in the metals recovery plant and stored in lined ponds.

The process plant includes significant reagent handling and preparation facilities. There are two H_2S plants that include two hydrogen plants with sulphur handling facilities. Additionally there are facilities for limestone crushing and preparation, lime slaking and preparation, and concentrated sulphuric acid handling and addition systems.

7.6.1 Current Operational status

MATERIALS HANDLING

Primary Crushing

Talvivaara has been working with Metso to optimise the primary crushing system. Metso have identified a number of improvements that have had a marked effect on circuit performance. The main improvements over the past two years have been:

- Modified blasting to improve fragmentation of the ore and to reduce the maximum top size;
- New drive coupling;
- Revised concave and mantle design; this work is ongoing and a further modification will be installed at the next major maintenance shut down;

- Improved materials to reduce wear and subsequent maintenance downtime; and
- A redesigned control room and rock pick control station; this has resulted in better operator working conditions which have resulted in improved performance of the crushing system.

The overall system has been operated at 3,500 to 4,000 t/h. At this throughput the 21 Mt/y rate required up to 2015 will be readily achievable with realistic operating times and maintenance schedules. The 26 Mt/y production rate will be a challenge and will require at least 20 hour per day operation at maximum throughput and with minimal, one day per month, scheduled maintenance, This should be achievable provided sufficient ore is delivered from the open pit, and thus the system is capable of achieving the tonnage required for the 50 kt Ni case.

Fine Crushing and Screening

The fine crushing plant has been modified and uprated since installation.

The main modifications are:

- Installation of an additional crushing stage between the stockpile and the original fine crushing plant;
- Installation of additional fine crushing screens;
- Revised conveyor layouts to reduce the number of pieces of equipment, reduce the maintenance requirements and improve the overall system availability;
- Installation of clam shell gates to protect conveyors from overload situation on shutdowns;
- Modified dust control systems throughout including additional exhaust air filtration;
- Installation of a dedicated materials handling control room (adjacent to the new secondary crushing building);
- Revised control equipment and control sequencing; and
- From a process perspective, an increase in the screen mesh on the sizing screens to increase the nominal feed size fed to leaching and to decrease the percentage of fines.

The main advantage of the latter change is the reduction in feed tonnage from the screens to the tertiary crushers and a reduction in the circulating load from the quaternary crushers to the tertiary circuit. This change will be phased in completely during 2013 as part of routine screen maintenance.

The FAM stacker does not appear to be the bottleneck and the main issues are in the crushing and screening section.

Talvivaara advised that the fine crushing plant has operated without issue at a throughput of 3,300 t/h of material for feed to the primary heaps. Based on this feed rate the plant can readily achieve 18 Mt/y over 18 hours per day and 21 Mt/y over 20 hours per day, both allowing 6 days per week operation. The 21 Mt/y duty will require increased operating time and should still be achievable although considerable effort will be required from a maintenance perspective. The 26 Mt/y scenario required for the 50 kt/y Ni production is not realistically achievable on a routine basis and additional equipment will be required to increase the availability of the overall system and allow maintenance of equipment to occur while the rest of the plant is running. Talvivaara has recognized this and two additional cone crushers will be installed in the tertiary and quaternary circuits. Capital of EUR 4.5 million has been included in 2015 for these, including 2 new cone crushers and one agglomeration drum.

Agglomeration

Four agglomeration drums are installed. There are no reported issues with capacity in this part of the materials handling plant. The four agglomeration drums should be satisfactory for up to 21 Mt/y feed to the heap. Talvivaara have included a fifth agglomeration drum in the capital cost allowance for 2015 as noted above.

Primary stacking

The primary stacking system including the FAM stacker can handle 4,000 t/h of agglomerated ore. As the availability of the conveying equipment and the stacker is high, SRK considers that this system is capable of processing 26 Mt/y of crushed ore to achieve the 50 kt/y Ni production level.

Primary Heap Reclamation

Primary heap reclamation methodology and practice is an area of major concern and is currently delaying the placement of freshly crushed ore onto the primary pad. Crushing of ore and primary stacking has been suspended since September 2012 because of the water in the open pit and because there was no room on the primary pad. Talvivaara advised that contractor resources would have been available for additional capacity to move more material from the pad.

The original design for primary heap reclamation included a mechanical reclaimer wheel and conveying system. The reclaimer was not procured and Talvivaara has been working on developing an alternative reclaim methodology.

Ideally, in order to prepare the primary leached ore for secondary leaching, the material needs to be broken up typically in to minus 200 mm pieces. The material appears to be extremely porous, but has essentially re-agglomerated into massive pieces. The solid appears to be highly oxidized, contains significant metal salts, and is reportedly very abrasive. Impact by the teeth of the large excavator buckets does not readily break the material.

Talvivaara is conscious of maintaining the integrity of the primary pad, the liner, the base layer and the installed drainage pipework. Therefore, the Company is limited in the methods that can be employed to break and excavate the material.

The current primary heap reclamation method involves mechanical reclamation by excavators. Excavated material is handled by two methods:

- Material is fed to two roll crushers located on the pad (feed hopper, crusher, discharge chute) and conveying to the secondary pad by the permanent reclaim conveying system. Contractor crushers are also available to supplement this equipment;
- Material is loaded in to contractor trucks and transferred directly to the secondary pad uncrushed.

Approximately 65% of the reclaimed material has been crushed and conveyed to the secondary pad, with the balance being trucked.

This reclaim/crushing method has been in use since February 2011. Two sizer units are installed on the pad. The units have proved to be somewhat unreliable and require a lot of maintenance. In general conveyer system reliability has been relatively good, varying between 60% and 80% depending on the time of the year. However, sizer reliability has been unsatisfactory, with around 30% availability. Poor weather conditions have also affected efficiency. These factors have had a significant impact on the tonnages that can be reclaimed and crushed.

For the 50 kt/y Ni case a reclaim rate of approximately 72 kt/d of leached ore is required 365 days per year to achieve 26 Mt/y. This represents a 15 m reclaim of a 400 m wide x 8 m high primary heap every day.

During the latter months of 2012 the two large excavators from the mine were used for reclamation of material. This is only possible because mining was suspended. Once mining restarts there will be a conflict of equipment use. The contractors have invested in new equipment and have sufficient capacity for reclaiming, if required.

Mining is due to restart in mid 2013; consequently, Talvivaara has until the middle of 2013 to resolve these issues to allow resumption of stacking and regular production to be maintained on a continuous basis. The problems with reclamation at design tonnage are a serious risk to ongoing metal production and need to be resolved within the next six months. However, empty space has been created on the primary pad as reclaiming has continued during the stoppage of ore production, allowing for some flexibility.

There is also a risk of damage to the primary pads due to the reclamation method being used and the much greater requirement for mobile reclamation equipment on the pad. Talvivaara advised that they are retaining a reasonably deep (300 to 500 mm) protective layer of leached solids above the prepared base to afford some protection.

During the site visit in early January 2013 Talvivaara advised that a second hand jaw crusher had been procured and was already at site being assembled for crushing reclaimed material. The equipment is reported to be a mobile crushing and conveyor system (Lokotrack LT140 s/n 74449) which will increase the reclaiming capacity by 22,000-30,000 t/day. The crusher was reportedly large enough to accept direct tipped material from a small truck and is semi-transportable so that it can be moved around the pad to suit the reclamation requirements. Talvivaara advised that together with the existing sizers, the three crushers would be capable of handling 20 to 24 Mt/y material. Any excess material can be reclaimed by using contractors and capital allowance is also included, if more equipment is required, in 2014. The plan is to use the elevated heap as a ramp to dump material in to the crusher feed hopper. Product from the unit would be conveyed to the permanent pad by conveyors. A capex allowance of EUR 1 million has been included in 2013. The jaw crusher should be operational in February 2013.

Other alternative methods for material reclamation are being investigated. These include the purchase of a new high capacity jaw crusher sized to manage the entire requirement of 4,000 tph of reclaimed material. A pre-feasibility study with Metso has been started. The system would require a capex investment of the order of EUR 5 million and the equipment would have a delivery time in the range of 6-12 months depending on the supplier.

The option of using a bucket wheel excavator is being reconsidered. This work is ongoing with Thyssen and Sandvik to assess the suitability of such equipment to handle the Talvivaara material. Capital costs and delivery times are not known at this time.

A capital allowance of EUR 6 to 7 million has been included in 2013/2014 to study, identify and implement a workable solution.

Leached Ore Competency

The competency or hardness of the leached ore has been found to be variable depending on the leaching conditions and weather conditions, specifically freezing winter temperatures.

The maximum shear force required to break the more difficult ore has been measured in the laboratory at 30 MPa. While this is very high and could be problematical for a bucket wheel excavator two suppliers are conducting tests to assess the suitability of bucket wheel excavator equipment as an alternative to the wheeled excavators and truck option. Preliminary findings are expected in Q1 2013.

As part of this assessment Talvivaara is also investigating the effect of different processing conditions on the final leached ore competency.

PRIMARY BIO-HEAP LEACHING

Primary Heap Aeration

Heap aeration has been identified as a major contributor to poor leaching performance. Excavation of the primary heaps from initial operation indicated that the material had not been oxidized and air was not being distributed throughout the heap.

Talvivaara has modified the air addition pipe work. Typically, the following improvements are used:

- Two aeration pipes are now installed, one at the base of the heap, one in the centre of the heap;
- The 400 m long slotted distributor did not give even air flows along the length and this has been replaced by a herring bone distributor system; a single main with multiple slotted off takes on either side; and
- Flooding of the lower air mains, especially on Pads 1 and 2, has resulted in poor air distribution. These aeration pipes are now installed above the drainage layer to avoid flooding issues.

The installation of the split level air mains has resulted in a step change in leach performance. The other improvements are still being evaluated but appear to improve air distribution.

Primary Heap Solution Management

There are no issues with solution management around the primary heap.

Leaching Metallurgical Performance

The metallurgical performance of the primary bio-heap leach has been an issue since start-up. The extraction of metals, notably nickel, is below expectations based on the pilot plant testing. The initial leaching performance immediately after start-up was inconsistent, different sections of the heap behaved differently, and relatively poorly compared to the pilot plant results. Subsequent to this the overall leaching performance for both Ni and Zn is much improved, although still variable between the four different primary pad sections. Leaching is ongoing and currently the primary leaching achieves 60 to 70% Ni extraction and in excess of 70% Zn extraction. Leaching of Co and Cu is still relatively low as expected.

A comparison of the leaching performance between the BFS, the pilot plant and the current expectations and performance is summarised in Table 7-2.

Table 7-2: Comparative Leach Extractions

	Total Leaching Time	BFS	Pilot Plant	Current Plan	Leaching Extraction Achieved to Date
Overall	4 to 5 years				at least 5 years

Ni maximum extraction (primary and secondary)	36 months	85%	+98%	92.1%	65% ongoing
Zn maximum extraction (primary and secondary)	41 months	80%	+98%	91.6%	70% ongoing
Cu maximum extraction (primary and secondary)	48 months	50%	21.9%	30.4%	< 10% ongoing
Co maximum extraction (primary and secondary)	48 months	50%	35.1%	44.7%	Variable 5 to 20% < 10%overall and ongoing

It is important to understand that the leaching cycle is long; primary leaching is 1.5 years and secondary leaching at least three years.

The leach extractions have been calculated for the primary heap for Ni and Zn and are presented in Figure 7-1 and Figure 7-2.

The leaching performance is still variable and is not fully understood. Metal re-precipitation in the heaps has been observed and solids analysis indicates that it is definitely occurring, but the actual mechanism and the effect of the different variables is not fully understood.

Analysis of wet solids from the primary heaps is routinely performed and indicates that some parts of the heap contain levels of Ni in excess of the average feed solids. This is an indication of metal re-precipitation. Most of the solids analysed indicate low metal grades indicating very good leach extraction. Unfortunately, the methodology used in the analysis is flawed and the solids were not washed to remove the entrained metal bearing solution. Consequently the dried solids analyses reported will include the crystallised metal salts. In general, taking this error in to account, the Ni extracted is between 75% and 85% and the zinc extraction is between 70% and 80%, both based on solids analyses.

From the graphs the poor leaching on the first heap placed in 2008 is evident. The improved leaching on subsequent heaps, due mainly to improved air distribution, is clear.

Primary heap leaching is different on downhill sections compared to uphill sections. Pads 1 and 2 are downhill and leaching performance is affected by the air main flooding issue described above, which is being rectified through aeration improvements. Pads 3 and 4 are uphill sections and are not affected in the same way. The better performance of Pads 3 and 4 is evident. Ni extraction on pads 3 and 4 (uphill pads) is 60 to 70% and Zn extraction is around 70%.

In terms of solution grades the concentrations are below the levels achieved in the pilot plant and below the level used for the metals recovery plant design. This is important as the flow rate and solution concentration dictate the metals load of the metals recovery plant.

The current solution concentrations are low because of problems with excess water in the overall circuit and problems with metal re-precipitation in the heaps.

The concentrations have been gradually increasing since start-up and SRK expects this to improve as Talvivaara improves the water management throughout the process and prevents excessive volume of liquid building up in the circuit, gains a better understanding of the different factors affecting the operation of the heap and as the primary-secondary heap cycle approaches an equilibrium condition. However, it is a critical issue as it will affect the capacity of the metals recovery plant.

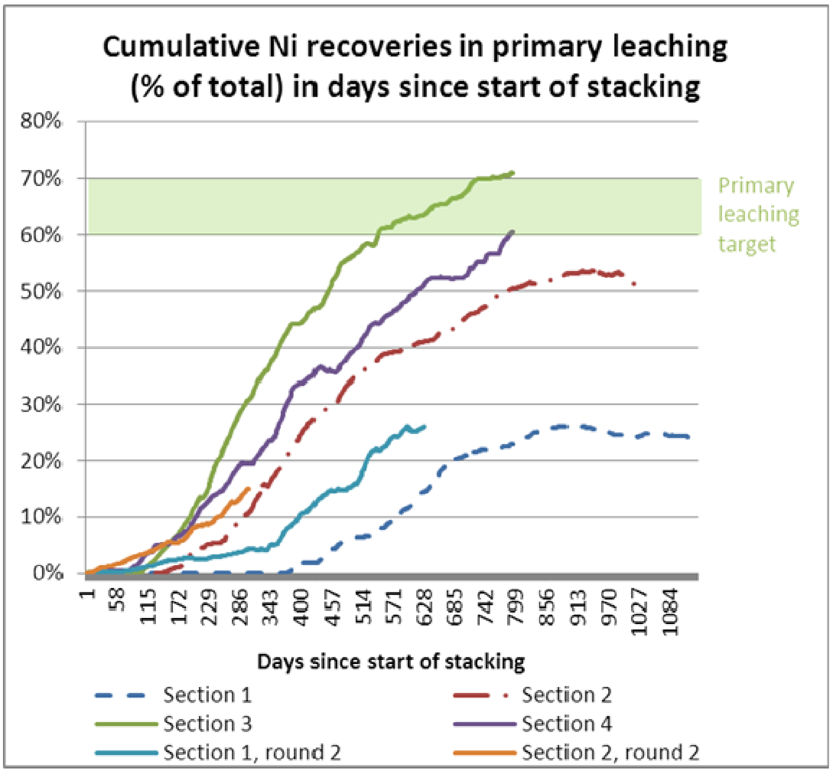


Figure 7-1: Estimated Ni Leaching since start-up – by section, primary heap

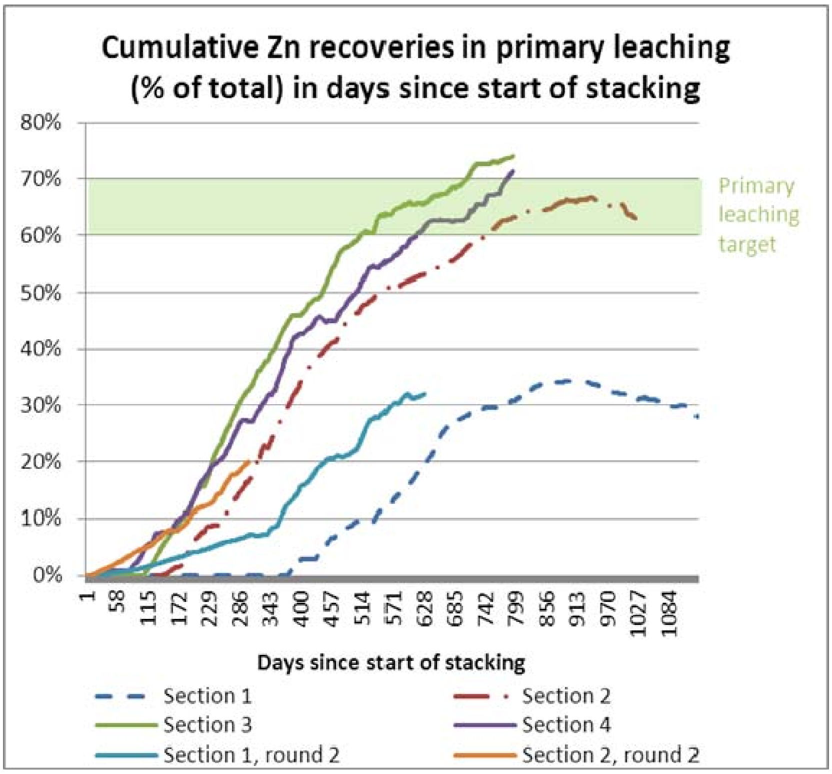


Figure 7-2: Estimated Zn Leaching since start-up – by section, primary heap

The evaluation of leaching performance is difficult and is ongoing. Talvivaara has implemented a more focussed metallurgical team, including external consultants, to resolve the leaching issues.

Leaching has still not operated for the full four to five year leach cycle and, consequently, the leaching performance is not yet proven (primary and secondary) on an industrial scale. The final leach extractions of the four pay metals are not yet confirmed. This is due to a combination of operational issues and the four to five year leaching cycle.

SRK considers that two to three years will be required before a realistic assessment can be made, primarily for Ni and Zn. While this is obviously an issue of great concern the leaching is much improved compared to the initial operation and SRK expects this improvement to continue.

SECONDARY BIO-HEAP LEACHING

General

The secondary leaching system has been operational since the beginning of 2011. Because of the primary leaching issues since start up secondary leaching is seen as much more significant than originally anticipated, in terms of metal extraction, than the pilot heaps and the original design.

Some crushed ore (approximately 1 Mt) has been added directly to the secondary leach pad as primary pad space was not available.

Secondary Heap Stacking Practice

The secondary stacker is operational and there are no reported problems. The stacker is reported to be more flexible than the primary heap FAM stacker. The secondary stacker can operate in advance or retreat mode.

Secondary Heap Aeration

There were no reported issues with the secondary heap aeration system. Talvivaara is still experimenting with the optimal installation of piping.

Secondary Heap Solution Management

Pregnant leach solution (PLS) from the secondary heap is collected in ponds adjacent to the heap and solution percolates through the base layers of the heaped material. The solution is pumped either back to the secondary heap or forwarded to the primary heap solution ponds.

Raffinate from the metals plant is used for irrigation. There were no reported issues with this system. The recycling regime and forwarding of solution to primary leaching is still being developed.

Secondary Leaching Performance

The poorly leached primary leach material from the first heaps, high in contained “leached/re-precipitated” metals has been stacked separately to allow the amount of metal released to be monitored. Talvivaara reported that this material is leaching well but an evaluation of the amount of metal released has not been finalised. This is still being evaluated.

The secondary leaching of primary reclaimed material has started and is still being evaluated. Talvivaara advised that initial results indicate that leaching is progressing well and that the leaching performance of the material removed from first round primary heap sections 1 and 2 has been much better in the secondary heap. Nickel yield has been significantly higher than during primary leaching, even higher than during the original pilot heap. The improved performance is probably due to improved aeration compared with the original bottom aeration arrangement used initially on the primary heap. This improved performance is the main reason that Talvivaara expects that targeted total recoveries will be reached. This is still being monitored/evaluated.

METAL PRODUCTION DURING CESSATION OF MINING IN 2012-2013

Mining has been suspended and fresh ore will not be fed to the pads until July 2013. During this period metal will be extracted from the existing material on the primary and secondary leach pads.

Talvivaara has estimated the metal content of this material and has prepared a metal production plan. This is based on ongoing leaching of this material, re-leaching of the re-precipitated metal salts from the initial operations and depletion of the metals in solution inventory contained in the heaps and associated circuits. The inventory including in solids and in liquid has been assessed based on the ore placed and the metals produced as at the end 2012.

SRK has reviewed the figures and considers them to be reasonable.

METALS RECOVERY PLANT

Safety

Talvivaara advised that following the fatality earlier in 2012 it has reviewed all safety procedures on the metals recovery plant.

Throughput

The metals recovery plant has not been operated at design solution metal loadings because the leaching is not yet at design levels. To date the maximum Ni production has been 80 to 90 t/d for a few days in June 2011, corresponding to an annualised Ni production of approximately 30 kt/y. The PLS contained approximately 3 gpl Ni and 6 to 7 gpl Zn and the PLS flow rates were 65 to 80% of the maximum hydraulic flow of 1,800 m^3/hour. While this metal production level was not sustained it represents approximately 60% of the 50 kt/y Ni case. The corresponding figures for the zinc circuit were 190 to 200 t/day or 70 kt/y Zn. The metal recoveries in the plant were generally 95 to 97%.

Talvivaara is still learning about the specific chemistry for the process and optimisation is ongoing. This is considered normal practice and is not seen as an issue.

The H_2S plants are critical to metal recovery plant production. The historical issues with the poor reliability of the H_2S plants has been evaluated and operating procedures have been modified. The operating regime has been revised to lower temperature operation and to date there have not been any corrosion problems, although extended operation is still required to prove reliability of H_2S plants. Talvivaara is monitoring the situation.

Within the precipitation sections, an improved H_2S addition system is being installed (materials of construction, control valves, piping and instrumentation). This work is in progress and a budget of EUR1 million was reported as having been approved.

Product thickening and filtration are satisfactory and most issues appear to have been resolved. Two additional pressure filters were installed on the zinc belt filter product to reduce shipping moisture to an acceptable transportable moisture limit (TML).

The H_2S odour problem around the site is much improved. Talvivaara continues to develop the systems. This work is ongoing and is not seen as a major problem.

One area of concern is the PLS grades as discussed previously. The metals recovery plant capacity in terms of metal load is a function of solution flow rate and PLS grades. The former has been maximised. The latter has been an issue as the volumes of water in the leaching circuit together with the lower than expected leaching levels has resulted in lower than expected PLS grades. The grades have been steadily increasing but have still to reach the required levels to achieve the desired metal production.

The metals recovery circuit has not operated consistently at the design metal production levels. The maximum sustained Ni production rate equivalent to an annualised Ni production of 22 kt/y was achieved in December 2011. While SRK considers that the production rate of 30 kt/y Ni should not be a problem, higher metal loadings will be required to prove that the circuit can achieve the metal precipitation rates, the iron oxidation and aluminium precipitation rates, can deliver the reagents required especially H_2S and can handle the higher solids loadings in the thickening and filtration circuits, for the 50 kt/y Ni production level.

Reagent Systems

The reagent and utility systems are all fully operational.

The following modifications are required for ongoing operation and to be able to achieve the 50 kt/y Ni case.

The 50 kt/y Ni case will require additional H_2S generation capacity and the metals recovery plant will have to operate at a high availability. In order to ensure the availability of the metals plant as a whole, Talvivaara has included capital costs for the construction of an additional H_2S plant in 2016/2017 of approximately EUR 20 million.

Slaked lime is required to treat solution prior to either recycling or discharge. The capacity of the existing slaker was too small and Talvivaara is re-commissioning the lime mill as a lime slaking mill and is renting a 7 t/h lime slaking duty. This will give a lime slaking capacity of 20 t/h, which should remove this bottleneck.

URANIUM PLANT

The small amount of uranium in the ore is leached with the other metals in bio-heap leaching. In the original plant design the uranium metal was precipitated with the effluents and deposited as a stable solid in the gypsum ponds.

In 2010, Talvivaara signed an agreement with Cameco to design and construct a uranium extraction plant to recover uranium from the existing PLS. Cameco has provided funding of around US$70 million to cover construction of the uranium extraction circuit and this upfront payment will be repaid by product deliveries in the initial years of operation.

Outotec is the main technology supplier for the solvent extraction and precipitation process areas.

The flowsheet of the existing metals recovery plant has been modified to route the solution ex zinc recovery (from the zinc thickener overflow system) to the uranium plant feed tank. The uranium plant will use conventional technology to recover the uranium as U_3O_8 or yellow cake. Following uranium extraction, the raffinate from uranium solvent extraction, containing Ni and Co in solution, will be returned to the metals recovery plant for further processing to recover metals.

The plant is in an advanced stage of construction and process commissioning is planned for Q3 2013 subject to permitting.

The annual operating cost estimate provided by Talvivaara is EUR 9 million at full capacity.

The following risks relating to integration of the uranium plant have been identified:

- Potential issues with integration of the uranium plant into the existing leaching and metals recovery circuit and potential downtime resulting in lost production of Ni and Zn;
- Unknown effect on circuit and potential detrimental operational issues during start-up/integration, specifically:
    - the effect of trace organic reagents on bio-heap leaching;
    - the effects of the various recycle circuits on the metals recovery plant;

- the change in solution chemistry from the original metals recovery plant design; and
- public perception of the overall operation once uranium production starts “for real”.

ACHIEVABILITY OF 50,000 T/Y NI

The achievability of the 50 kt/y Ni is dependent on a number of issues in different areas of the plant. Some of the issues can be readily solved with additional expenditure, others are ore-dependent. Overall SRK considers that the 50 kt/y Ni will not be achieved for at least three years if all the issues previously identified are resolved. The production will gradually increase from the current level to the target figure over this period of time.

PROJECT OVERLORD

In general terms, the project is a doubling of capacity from the current target of 50 kt/y Ni. The expanded plant would include significant additional processing to produce alternative products notably Ni metal, Zn metal, together with numerous alternatives to meet market demands.

Currently Talvivaara personnel focus on achieving the 50 kt/year Ni production level.

8 SITE INFRASTRUCTURE

8.1 Power

Power is supplied from the Finnish grid via a single 110 kV power transmission line. In general the supply is reliable. The incoming line is rated for a 180 MW load. Currently approximately 45 MW are used. Emergency generators are currently not installed, although 2 x 1.2 MW generators are being considered. An Uninterrupted Power Supply is installed for critical safety and control systems. Critical spares for the power system are reported to be held at site. There are no other significant risks in this area.

The existing power line can support the 50 kt/y Ni case.

8.2 RAW WATER SUPPLY AND WATER BALANCE ISSUES

8.2.1 Raw Water Supply

The raw water supply is pumped from the lake at the future Kolmisoppi open pit. The original design was rated for 4,000m^3/h. The current raw water make-up is reported to be only 200 m^3/h. Talvivaara has made a number of changes to improve the water management and water balance for the project. There are no major issues with the raw water supply system and it can easily support the 50 kt/y Ni case.

8.2.2 Water Balance

The original design was for a zero discharge system. Since start-up there has been a water balance problem, primarily due to lower than expected evaporation from the leach pads. Due to incorrect water balance predictions the water balance is now net positive, rather than net negative, as predicted. This has been exacerbated by excessive rainfall and snow melt in 2012, as well as operational issues related to limits to discharge volumes. This has resulted in excess water in the circuit necessitating a number of non-conforming discharges to environment.

In order to rectify this issue Talvivaara has modified the water circuits into a clean water system and a recycle water system. This minimizes raw water make-up to the circuit.

A new clean water pond has been installed with 16 hours capacity for handling the recycle waters. The original raw water pond is used to feed the water treatment plant. Lower sulphate content is needed for this purpose and therefore lake water is used as the feed.

Because of the issues with discharges, Talvivaara has installed two reverse osmosis (RO) plants rated for 75 m^3/h each. A third has been ordered and will be installed during the spring of 2013. The intent is for any future discharge water to be processed through these RO plants. These plants will effectively minimize raw water make-up and give a more controlled discharge situation.

8.2.3 Excess water discharge

Excess water has been pumped to the open pit. The water will be discharged to environment via a pond after pH adjustment with lime to precipitate any metals. The discharge has been discussed with the authorities and Talvivaara advised that it has applied for a permit to allow the discharge.

Excess water adjacent to the gypsum pond has been contained by construction of a new berm. The water will be discharged to the environment after treatment and under controlled conditions during the spring melt. Talvivaara advised that this has been discussed and accepted by the authorities.

8.3 RAILWAY

A single track rail spur connects the Talvivaara site to the Finnish national railway network. The railway is used to bring in bulk reagents and chemicals, notably lime, limestone, sulphur, propane, sulphuric acid, and for export of all products in special containers. There are no reported issues with the rail system or the rolling stock. There have been a number of safety issues relating to the outsourced operators of the railway and marshalling yard. Talvivaara has reported the situation to the outsource company and resolution of the issues is ongoing. Apart from the safety issue, no other risks were identified.

The current railway capacity can support the 50 kt/y Ni case.

8.4 OTHER INFRASTRUCTURE

There are no issues with the other infrastructure at the mine.

9 HEALTH AND SAFETY

The fatality at Talvivaara in 2012 is a matter of public knowledge. Safety procedures at site have been reviewed and actions implemented. Details of this issue and the actions taken are reported by others.

10 ENVIRONMENTAL AND SOCIAL MANAGEMENT

There have been a number of environmental issues at site. These have been addressed and reported in detail by others.

As part of the SRK scope of work, SRK has reviewed the data available in the electronic data room and has discussed the issues and proposed action plans with site personnel. SRK is satisfied that provided that the action plans are implemented there are no fatal flaws to prevent continued development of the resource at Talvivaara.

11 OPERATING AND CAPITAL COSTS

11.1 Production

SRK has reviewed the payable metal production in the Talvivaara Base Case with regard to the timing of the release of metal from the leach pads and consider the planned production profile to be optimistic. SRK has therefore adjusted the payable metal production profile in line with the adjusted Ni leaching/release profile as provided by the Company. The adjusted profile is presented in Figure 11-1 below.

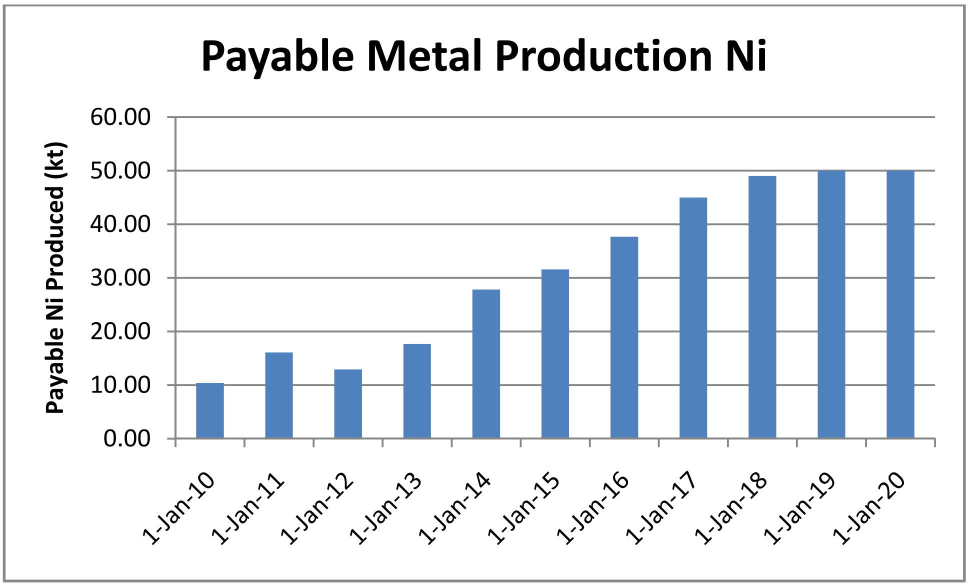


Figure 11-1: SRK Adjusted Ni Production

11.2 Capital Cost

Total Capital Costs amount to EUR 325 million over the period 2013 to 2020. The major items in this capital are mining EUR 31 million, metal recovery EUR 33 million (including EUR 20 million for an additional H_2S plant), bioleaching and water management EUR 23 million and metals production maintenance EUR 23 million. Contingency had been included and amounts to EUR 37 million up to 2017, and long term sustaining capital has been estimated at EUR 38 million per year from 2018 onwards.

11.3 Operating Costs

SRK has reviewed the operating costs and has made an adjustment to the mining costs in 2014 to 2016. SRK has increased unit costs in 2014 to EUR 1.70/t mined, in 2015 to EUR 1.60/t mined and from 2016 onwards to EUR 1.50/t mined as per the planned long term cost. Total operating costs and unit operating costs per ton Ni produced are presented in Figure 11-2 and Figure 11-3 below.

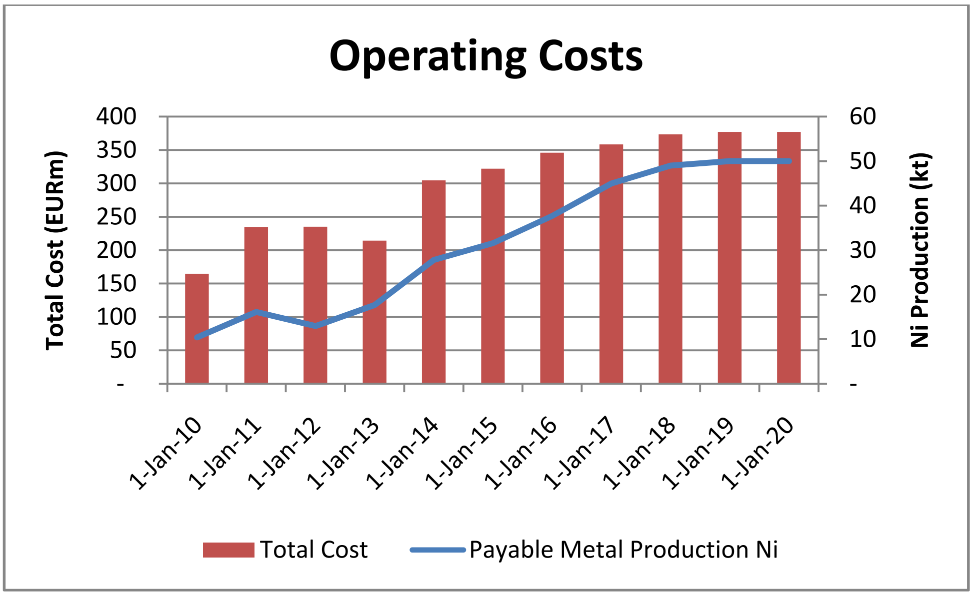


Figure 11-2: Talvivaara Operating Costs

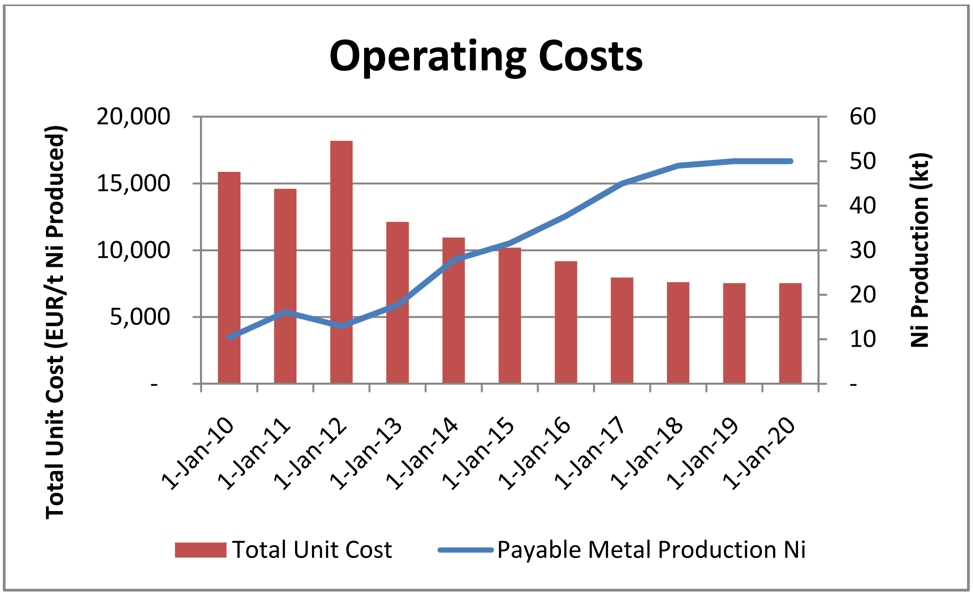
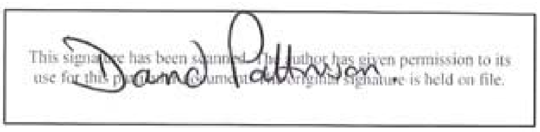


Figure 11-3: Talvivaara Unit Operating Costs

For and on behalf of SRK Consulting (UK) Limited



Dr David Pattinson,
Corporate Consultant,
SRK Consulting (UK) Limited

Rick Skelton
Corporate Consultant (Mining Engineering),
SRK Consulting (UK) Limited

Abbreviations

Abbreviation	Unit or Term
%	percent
BFS	Bankable Feasibility Study
C	carbon
Co	cobalt
Cu	copper
EUR	Euro (currency)
IMMM	Institute of Materials, Mining & Metallurgy
ILS	intermediate leach solution
LoMp	Life of Mine plan
MARC	Maintenance and Repair Contracts
MCOG	marginal cut-off grade
MI	Measured and Indicated resource
Ni	nickel
OCOG	operating cut-off grade
PLS	pregnant leach solution
QA/QC	Quality Assurance/Quality Control
RO	Reverse osmosis
ROM	Run of Mine
S	sulfur
TML	transportable moisture limit
U	uranium
US$	United States dollar
Zn	zinc

Units

Abbreviation	**Unit or Term**
%	percent
µm	micron
d	day
dmt	dry metric tonne
g	gram
h	hour
km	kilometer
kV	kilovolt
kW	kilowatt
m	meter
mm	millimeter
Mt	Million metric tonnes
Mt/y	Million metric tonnes per year
MW	megawatt
ppm	parts per million
t	tonne (metric ton) (2,204.6 pounds)
t/y	tonnes per year