CURRICULUM VITAE

EXECUTIVE SUMMARY

**NAME** Krzysztof *(Kris)* **BIEGAJ**

**CURRENT EMPLOYER** Ausvac Mining Pty Ltd *(self-employed)*

**POSITION Mining Consulting – Business Improvement/Mine Management**

**SUMMARY OF 30 YEARS+ MINING EXPERIENCE**

* Eight ***(8*)** years in underground coal mining including one *(1)* year National Army Service *(Poland)*
  + - Poland then *(in the seventies)* was the one of the world’s largest coal producers and exporters
* Four and a half ***(4.5)*** years with the Western Australian Department of Mines including *(****2.5)*** years as District Inspector of Mines in Kalgoorlie - Deputy Regional Mining Engineer *(since 1991)*
  + - Including two ***(2)*** years as Special Inspector of Mines *(Ventilation)*/Senior Ventilation Engineer, Karratha
* Eighteen ***(18)*** years in managing underground and open pit metalliferous and gold mines
  + - Mostly in Australia and also in other parts of the world
    - **Majority** of the mine/project management jobs included design and approvals of site accommodations, mine offices and ablution facilities with environmentally-friendly used water treatment and discharge plants
* Two ***(2)*** years as Owner/Operator in design, construction and practical trials of the truly Mobile Underground Supersucker (UMS) - **first one in Australia *(possibly first one in the world)*** – a giant mobile underground vacuum cleaner and successful implementation of mine floor material recovery system in ore drives and stopes through a number of practical trials conducted underground ***(by myself)*** on gold and nickel mines in Australia
* Five ***(5)*** years as **Mining Consultant - Business Improvement** in Australia and various parts of the world *(Australia, Russia, Ghana, Mongolia and Philippines)*

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**Australia** - including 10 years with WMC Resources then Australia’s biggest underground mining company subsequently taken over by BHP Billiton:**(Underground Manager, Manager Mining and Registered Mine Manager):1992 – 2002**

* Owner-operator mines and Contractor operated mines on both piecework and salary systems
* Whilst managing Long Shaft Victor Complex at Kambalda Nickel Operations *(KNO)* responsible for **40%** of total KNO nickel production at low costs
  + WMC Resources KNO then produced **37,000** Ni tonnes/year *(with* ***nine******(9)*** *operating mines)*
* Initiated, introduced and successfully implemented:
  + Number of unique initiatives and systems to minimise ore dilution
  + Major productivity improvements ***(up to 270%)* with no pay increase**
  + Significant cost reduction measures
* **Managed seismically active nickel mines**
* In 2001, at the Central Norseman Gold Corporation *(CNGC – then 50.5% owned by WMC Resources)* led the mining Team to the highest sustainable gold production in then 65 years Company history ***(128,300oz/year)* with C1 and C3 costs** being in the **first quartile** of the **cheapest gold producers in the world** with gold price **~US$320/oz.** and excellent safety record – in a **very narrow vein mining operations**
* Contract tender evaluations and preparations; managed change-overs from Owner - Operator mines to Contractor
* Initiated and implemented 12 hour continuous roster system and various payment systems
* Feasibility studies, financial evaluations and starting-up new mining projects
* Came up with and designed alternative capital mine access and hoisting system for small tonnage, high-grade underground deposits

**Russia and Kazakhstan: 2002 – 2005***(2 years in total)*

* **Mining Consultant** – design, Regional Mines Department approval and start-up of a new, **first one in Kazakhstan decline-accessed only underground mine** at Suzdal Gold Project*.* Also site visits and due diligence studies/evaluations of various mining projects for potential purchasing in Kazakhstan and Kyrgyzstan *(2004 - 2005)*
* **Site Director**, **Mining Engineer** and **Consultant,** Far East Siberia Russia - **Nezhdaninskoye** **Gold Project** *(2002 – 2003)*
  + **Fluent in the Russian language – no interpreters required**

**Africa (Ghana): 2009 – 2010***(1.5 years)*

* **Executive Manager Mining** - managing 1.5km deep, 8.5km long and **>4,000** people **2.2mln** **t/year 380,000oz/year** **AngloGold Ashanti Obuasi Gold Mine** with various mining methods ***(then the biggest gold mine in Ghana);*** also responsible for open pit mining and old tailings reclamation operations
  + Resigned after contracting malaria; after request from the AngloGold Ashanti in March 2011 went back to Obuasi for one (1) year to assist in completing the Projects started in 2009 – 2010.

**Based in Australia***(with intervals for overseas work)* **– 2003 to date**

* **Director – Ausvac Mining P/L** 
  + - Contract mine management in Australia *(u/g & o/pit gold, u/g nickel, o/pit iron ore),* including **a highly seismically active, then deepest gold mine in Australia** *(Mt Magnet Gold Mine).*
    - **Mining Consulting – Business Improvement** in Australia, Ghana ***(AngloGold Ashanti Obuasi Gold Mine),*** Russia, Mongolia, and Philippines
* Two ***(2)*** years in development and operating a private mining company Ausvac Mining Pty Ltd specialising in recovery of mine floor material on both nickel and gold mines in Australia with Underground Mobile Supersucker ***(UMS)*** – a giant mobile vacuum cleaner
  + - The already capitally developed and broken ore on the floor of ore drives and stopes that cannot be taken with conventional mining equipment and is normally left **behind and hidden** in various factors by mine management

# Brief Detailed Summary

**Name** Krzysztof *(Kris)* **Biegaj**

**Academic Qualifications** B. Eng. Mining *(Honors)*

**Professional Qualifications** Member of Australasian Institute of Mining and Metallurgy since 1992

**Certificates held:** Western Australian 1st Class Mine Manager’s *(Metalliferous),* 1989

Western Australian 1st Class Mine Manager’s *(Coal)*, 1989

Work History Brief

Nov 2010 – to date Ausvac Mining Pty Ltd, Perth Western Australia *(WA)*

* Mine Management, Business Improvement – Mining Consulting, Operator *(through Ausvac Mining P/L)*
  + - Alternate Underground Manager - Water Tank Hill Mt Magnet Resources Pty Ltd Western Australia *(Nov-17 to date),* Business Improvement - Mining Consulting – Far East Russia *(Kamchatka Peninsula - Aug-2017)*, Project Manager – Water Tank Hill Underground Mt Magnet at Ramelius Resources Pty Lt Western Australia *(Jul-16 to Feb-17);* Business Improvement - Mining Consulting in: Australia, Far East Russia *(Khabarovsk Region)*, Mongolia and Philippines; Alternate Resident Manager/General Manager and Mining Manager – Contract Mine Management in Western Australia *(WA)* for Kentor Gold*;* Business Improvement - Mining Consulting: in Far East Russia *(Kamchatka Peninsula),* Ghana at AngloGold Ashanti Obuasi Gold Mine; Operator - Mine floor ore material recovery with Underground Mobile Supersucker *(UMS)* at Central Norseman Gold, Norseman *(WA)*

2009 to 2010 *(1.5 years)* AngloGold Ashanti Obuasi Gold Mine, Ghana

* + - * + **Executive Manager – Mining**

2005 to 2009 Ausvac Mining Pty Ltd, Kalgoorlie-Boulder/Perth, WA

* + - * + **Mine Management, Business Improvement – Mining Consulting, Operator** *(through Ausvac Mining P/L)*
* Contract mine management in Australia; Mining Consulting in Africa ***(AngloGold Ashanti - Obuasi Gold Mine)*** and Russia; **Mine floor material recovery** with UMS in WA’s underground mines *(nickel and gold)*

2004 to 2005 *(13 months)* Celtic Resources Holdings Plc. Ireland

* + - * + **Mining Consultant**
* Suzdal Gold Project, Semipalatinsk, **Kazakhstan**

2003 to 2004 Ausvac Mining Pty Ltd, Kalgoorlie-Boulder, WA

* + - * + **Owner/Director/Operator**
* Mine floor ore material recovery with UMS in Western Australia and Victoria State, Australia

2002 to 2003 *(11 months)* Celtic Resources Holdings Plc. Ireland

* + - * + **Site Director,** **Mining Engineer, Mining Consultant**
* Nezhdaninskoye Gold Project, Far East Siberia, **Russia**

1997 to 2002 Central Norseman Gold Corporation Ltd, WA *(51% owned by WMC)*

* + - * + **Manager Mining**
        + **Manager Mining Projects**
        + **Technical Services Manager**
        + **Underground Manager**
        + **Manager Mining**

1992 to 1997 WMC Resources Ltd Kambalda Nickel Operations, WA

* + - * + **Registered Mine Manager** – Long Shaft Victor Complex
        + **Underground Manager** – Long Shaft Victor Complex
        + **Underground Manager** – Coronet Decline
        + **Underground Manager** – Victor Decline
        + **Underground Manager** – Otter Juan
        + **Assistant Underground Manager** – Long Shaft

1987 to 1992 Western Australian Department of Minerals and Energy, WA

* + - * + **District Inspector of Mines**; **Deputy Regional Mining Engineer** *(since 1991),* Kalgoorlie
        + **Special Inspector of Mines** *(Ventilation)*/**Senior Ventilation Officer**, Karratha

1986 to 1987 Forklift Engineering *(Aust.),* Melbourne, Australia

* + - * + **Design Engineer** *(working as Mechanical Engineer)*

1981 to 1985 Regional Mines Rescue Station, Walbrzych, Poland

* + - * + **Mines Rescue Superintendent**
* Walbrzych Coal Mining Region with four (4) underground collieries then employed **>25,000** personnel underground

1977 to 1981 Walbrzych Underground Colliery, Poland

* **Acting Section Manager, Mine Foreman, Underground Supervisor/Shift Boss/Deputy, Trainee Mining Engineer**
* The Walbrzych Colliery then employed **> 6,500** personnel underground

ADDITIONAL INFORMATION

**Citizenship**

1. Australian *(since 1988)*

**Languages**

a. English - fluent

b. Polish - native tongue

c. Russian – fluent **- no interpreters required**

**Marital Status**

* Just married in February 2017; No children

**Licences and Permits**

1. **Western Australian First Class Mine Manager’s Certificate of Competency *(Metalliferous)* No 284, 1989**
2. **Western Australian First Class Mine Manager’s Certificate of Competency (Coal) No A-1-89, 1989**
3. Underground Supervisor’s Certificate of Competency, Grade 1. Regional Mining Authority, Walbrzych, Poland
4. Underground Supervisor’s Certificate of Competency, Grade 2. Regional Mining Authority, Walbrzych, Poland
5. Western Australian Driving Licence No. 3473215

**Interests**

* Bike riding/fitness
* Healthy cooking
* Wine making
* Sculpture
* Wooden furniture making

CONTACT

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Western Australia

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**Website: www.ausvacmining.com.au**

REFEREES

Names and contacts of Referees are available on request *(in Australia, Russia, Kazakhstan and Ghana)*

CURRICULUM VITAE

PROFESSIONAL EXPERIENCE

**Ausvac Mining Pty Ltd, Australia based in Perth, Western Australia March 2012 – to date**

**Owner/Director**

* **Alternate Underground Manager** - Water Tank Hill Mt Magnet Resources Pty Ltd Western Australia *(Nov-17 to date),* **Business Improvement Mining Consulting in Far East Russia on Kamchatka Peninsula** *(Underground gold mining (Aug-2017),***Project Manager** – Water Tank Hill Underground – Ramelius Resources Pty Ltd Mt Magnet Western Australia *(Jul-16 to Feb-17);* **Business Improvement Mining Consulting in:** Australia, Russia *(Open pit iron ore, Khabarovsk Region)*, Mongolia and Philippines *(Underground gold mining)*. **ASX Appointed Director of Operations of MUB Mongolian underground gold operations *(2013)***
* **Alternate Resident Manager/General Manager and Mining Manager – Contract mine management for Kentor Gold, Western Australia** *(open cut and underground gold mining – 2012)*
* **Mining Consulting – Business Improvement - Trans-Siberian Gold Mine on Kamchatka Peninsula, Far East Russia** *(2012 and 2017)*

**Obuasi Gold Mine - AngloGold Ashanti, Ghana, Africa March 2011- March 2012**

* **Manager Mine Projects - Member of Task Force to Long-term fix the Obuasi Gold Mine**

**Norseman Gold NL, Norseman WA**  **Nov 2010 – Jan 2011**

* **Owner/Operator**

##### 

* + Recovery of high grade gold bearing mine floor material at the Harlequin Underground Gold Mine

##### AngloGold Ashanti, Obuasi Gold Mine, Ghana Jun 2009 – Nov 2010

##### Executive Manager – Mining

Whilst based in the town of Obuasi, I was responsible for safety and all mining activities, including all surface mining *(open pits and tailings reclamation)* at the AngloGold Ashanti Obuasi Gold Mine, the biggest underground mine in Ghana. The mine employed >3,500 people underground and produced **2.2 million tonnes of ore for 380,000oz per annum,** with fully mechanized long-hole cemented cut and fill and sub-level caving stoping methods, from a number of sub-vertical ore bodies 3m – 40m wide, 8.5km long along the strike and 1.5km deep. Lateral development was then performed by hand-held techniques*.* **Previously in 2008 – 2009 I had worked as a Mining Consultant - Business Improvement for the Obuasi Gold Mine.**

**Achievements:**

* Initiated and successfully introduced/implemented:
  + Daily updated mine production and safety graphs at all sections of the mine *(surface offices included),* so each mine employee knew gold production and safety record
  + Underground crib rooms/refuge chambers
  + Food deliveries for the underground workforce
  + Industrial washing and drying machines for the workforce in surface change rooms
  + Personnel carriers underground for the underground workforce, maintenance and technical staff
  + 12hrs continuous roster system underground
  + Introduced tele-remote mucking to replace line-of-sight technique in open stopes
  + Remotely controlled rock breakers to operate inside stope voids
  + IT service vehicles underground
  + Charge-up machines underground
  + Light - weight cap lams for underground workforce
  + HDP/poly service pipes to replace expensive and difficult to install steel pipes
  + Flexible ventilation ducting to replace expensive spiral steel ducting
  + Two-stage air-leg machines to replace single-stage ones for correct ground support installation and more efficient drilling
* Led the introduction of Longitudinal Retreat Mining Method *(LRMM)* in narrower ore-bodies, to eliminate extremely costly and time consuming waste footwall development for ore-body definition diamond drilling *(designed in 2008 together with Christian Buafo – Chief Planning Engineer).*
* Introduced and implemented a number of managerial initiatives to improve communication, safety and production
* Came up with a number of technical changes/initiatives underground *(e.g. centralized firing, new blasting agents, leaky feeder communication* ***and many, many more)*.**

##### Ausvac Mining Pty Ltd, Australia based in Perth, Western Australia 2007 - 2009

##### Owner/Director/Operator

Running and operating a small private company specialising in underground mine floor clean-down with an underground mobile supersucker *(refer to further below).* **Also contract work as Mine/Mining Manager and Mining Consultant - Business Improvement**

* **Consulting work at the Obuasi Underground Gold Mine, AngloGold-Ashanti, Ghana *(2008 – 2009)***
* **Consulting work** on underground gold mining at Aginskoye Gold Mine on Kamchatka Peninsula, Far East Russia, *(2008)*
* **Contract Manager Mining** at Windarling/Mt Jackson iron ore open pit operations for Portman Iron Ore Limited, Western Australia *(WA)*; 7.2mln t/year iron ore production from a multi-pit operation *(2008)*
* **Contract Mine Manager** of Hill 50 - **highly seismically active**, then deepest gold mine in Australia *(1.5km)* and St George underground mine, Harmony Gold, Mt Magnet WA; 500,000t ore for 85,000oz/year production *(2007)*
  + **Introduction and fast implementation of rock-burst resistant cone bolts**
    - * **Operator - Mine floor clean-down** at Mincor’s Redross Nickel Mine in Wigdiemooltha area with UMS, WA *(2007)*
* **Contract Mine Manager** of Argo and Junction underground gold mines at St Ives Gold Mines, Goldfields, Kambalda, WA with 700,000t ore for 120,000oz/year production. *(2005 – 2006/six months)*
* **Operator - Mine floor clean-down** at Lightning Nickel Long Victor/Gibb South Nickel Mine in Kambalda with UMS, WA. *(2005)*

##### Celtic Resources Holdings plc. Suzdal Gold Project, Kazakhstan 2004 - 2005

##### Mining Consultant

Based in Semipalatinsk in Kazakhstan and reported to Director General

##### Responsible for:

* Design, approval and start-up of a new, **decline-accessed only *(then first one in Kazakhstan)*** underground 100,000oz/year gold mine at the Suzdal Gold Project located some 70km from Semipalatinsk in North-East Kazakhstan. Also was responsible for overseeing/controlling a multi-pit mining operation and construction of site accommodation and office facilities
* Various due diligence studies/projects evaluation work including site visits in Kazakhstan and Kyrgyzstan

##### Achievements:

* Design, the regional mines department approval and successful start-up of an Australian-style decline accessed only, early cash generating and cost efficient underground gold mine ***(together with fellow mining engineers from Kazakhstan)*.** First underground ore mined within 2.5 months from the commencement of a decline access from a surface/pit portal

**Ausvac Mining Pty Ltd, Western Australia, Kalgoorlie 2003 - 2004**

##### Owner/Director/Operator

Establishment and development of a company specialising in underground mine floor clean-down and the design, construction and development of one of the world’s first truly mobile underground supersucker *(UMS)* – a giant vacuum cleaner. The UMS together with other auxiliary equipment, forms part of a mine floor material recovery system, aimed at the enhancement of return on mine investment, i.e. providing an extra revenue through the reclamation of material that is normally left behind and lost in the course of **‘normal’** mining activities and hidden in various factors i.e. **the ore which has been capitally developed and already broken.**

Whilst the Company was established early in 2000, together with the construction of the UMS in Kalgoorlie, Western Australia, only in May 2003 time allowed for the first underground trials of the machine in mine floor clean down applications personally conducted by the owner.

Floor material recovery projects were conducted on the following mine sites in Australia: Mt Pleasant Gold Mine, Placer Dome, Kalgoorlie, Otter-Juan Nickel Mine Kambalda, Cosmos Nickel Mine, Jubilee Mines Leinster, Agnew Gold Mine, Goldfields, Agnew, Long-Victor Complex, Kambalda, Redross Nickel Mine, Kambalda, and Norseman Gold in Norseman *(all in Western Australia)* and Bendigo Gold Mine in Victoria.

The UMS was originally designed to carry out exploration winzing underground and extraction of high-grade nuggetty and variable gold deposits, including those located at the bottom of underground mines and open pits that did not warrant capital development.

##### Achievements:

* Coming up with a concept and development of Australia’s first mine floor recovery system with a truly mobile underground supersucker – a giant vacuum cleaner.
* To recover/mine already capitally developed and broken ore lying on the underground floors of ore drives and stopes that cannot be taken by conventional mining equipment and is “normally” **left behind and hidden in various factors** by mine management.
* Following a number of practical hands-on underground trials on various mine sites in Australia, floor material recovery rate of up to **20 tonnes/12hr** shift is now being achieved with **1** (one) operator per shift in a typical ore drive or horizontal/semi-horizontal excavation *(a 500% increase from the initial 8.0t/shift with two operators).* By double-shifting with two operators/shift, an **80 tonnes/day of ore floor material can now be recovered producing ~Aus$400,000-$2,500,000/month+ before-tax extra profit,** depending on grade and gold price ***(a profit which normally goes to waste).***

##### Celtic Resources Holdings plc. Nezhdaninskoye Gold Project, Southern 2002 - 2003

##### Verkhoyansk Mining Company *(SVMC)*, Yakutia, Far East Siberia, Russia

Nezhdaninskoye Gold Project then owned by SVMC was located in Russia’s Far East Siberia, in the Republic of Sakha (Yakutia), some 800km east of Yakutsk, its capital city or six hour flight East from Moscow, followed by a three hour helicopter flight from Yakutsk to the site.

The deposit is one of the largest in Russia with more than 20 million ounces of gold and 150 million ounces of silver in Resources. It is located in a remote, mountainous area with challenging communication and supply logistics. During Soviet Union times a production of 800kg of gold per year was reportedly achieved.

Staffing of management and workforce was based on a fly-in fly-out roster system, with up to 200 personnel on site with continued gold production from underground operations.

Until November 2002 Celtic Resources Holdings plc. had a 50% stake in SVMC with Russian partners owing the rest. Celtic also provided all top management including Director General based in Yakutsk office, Site Director/General Manager based on site *(myself),* and a limited number of expatriate site personnel *(2 - 4).*

##### Mining Consultant *(2003)* – Reported to Project Director based in London

##### Responsible for:

* Providing advice to the Company on all aspects of Nezhdaninskoye Gold Mining Project

##### Site Director *(2002 to 2003)* – Reported to Director General based in Yakutsk

##### Responsible for:

* Whilst based on site at Nezhdaninskoye, ensuring that strategic goals of the Company were met
* Day to day running of an underground gold project with Russian management and workforce *(~200 Russian staff),* and a limited number of expatriate staff on site *(2 to 4)*

##### Mine Engineer *(2002)* – Reported to Site Director/General Manager

##### Responsible for:

* Mine feasibility studies and mine equipment selection.
* Preparation of short, medium and long term mine forecast and budgets.
* Establishment of gold production monitoring and reconciliation systems *(mine to mill).*
* Preparation and review of documents for submission to Russian Authorities.
* Close liaison with all departments to ensure safe and efficient running of the operations.

##### Central Norseman Gold Corporation Ltd, Norseman, Western Australia 1997 to 2002

##### *(Then 50.49% owned by WMC Resources Limited)*

##### Manager Mining *(2001 to 2002)* – Reported to General Manager

Towards the end of year 2001, Croesus Mining NL, a local gold producer based in Kalgoorlie (*Western Australia)* bought out the company, after WMC decided to sell its gold assets.

The two *(2)* producing narrow vein underground mines at the time Bullen and Harlequin, employed variety of mining methods and equipment, including traditional airleg slot mining, airleg T-bone mining method, longholes, diesel/hydraulic TMU mini-jumbo mining method, single boom jumbo and two boom jumbo mining *(development),* with a combined output of 270,000 tonnes of high grade ore material per annum for ~125,000oz/year gold production.

The Bullen Mine was owner-operated mine and the Harlequin Mine was a Contractor operated mine since its commencement in 1994.

To utilise the existing spare mill capacity *(up to 500kt/annum),* a short-term “lower” grade open pit-mined material supplemented the high-grade ore from underground sources.

**Responsible for:**

* Achieving budgeted production and development targets in a cost effective and safe manner, in a narrow- vein gold operations comprising two *(2)* underground decline accessed mines – Bullen and Harlequin.
* Management of a mining team in excess of 130 employees, including 30 multidisciplinary professional staff.
* Management of operating and capital budget in excess of 35 million dollars per annum.
* Liaison with geology, OH&S, metallurgy, engineering and other departments to ensure effective and efficient running of mining operations and achievement of longer term sustainability.
* Feasibility study and evaluation of new mining projects.
* Acting General Manager for the site during the absence of General Manager.

**Achievements:**

* **Led the Mining Team to achieve the highest sustainable gold production in then 65 years Company history *(128,300oz/year)* with an excellent safety record *(combined MTI and LTI frequency rate less than 15).* During that time CNGC was one of the lowest costs producers in the world with both C1 and C3 costs positioned in the first quartile of all gold producers in the World, with then gold price ~ US$320/oz.**
* Came-up and implemented a grade enhancement **T-bone stoping mining** method *(40% grade increase).*

##### Mine Manager – Harlequin (2000 to 2001) – Reported to General Manager *(no Mining Manager in place)*

**Responsible for:**

* Achieving budgeted development and production targets in a cost effective and safe manner in an underground operation mining 69,000oz of gold per annum, from a highly challenging and complex multiple ore sources employing a variety of mining methods, long-hole open stoping and hand-held airleg mining included.
* Management of 78 personnel, including 70 Roche contractors, sub-contractors and 8 CNGC professional staff.
* Management of operational and capital budget in excess of 25 million dollars.
* Holding statutory responsibilities as Underground Manager under WA Mines Safety and Inspection Act 1994.

**Achievements:**

* Significant productivity improvement:
  + Roche Mining mine development rates per month *(30% - improvement)*
  + Airleg mining sub-contractor at the time *(30% - improvement)*
* Initiating and carrying out a comprehensive investigation into a HV1 crown pillar/HV1 pit, subsequently mined out by Croesus Mining NL i.e. the next owner

##### Manager Mining Projects *(1999 to 2000)* – Reported to Mining Manager

**Responsible for:**

* Feasibility study, financial evaluation, contract tender evaluation and mining two open pits, Scotia and Jubilation
* Running new mining projects, including equipment and mine design input
* Hands-on trial of a high- grade pillar recovery in an old shrink stopes area of the CNGC’s OK Mine

**Achievements:**

* Design of an alternative mine hoisting system concept *(see Publications)*
* Feasibility study, introduction and first underground trial in Australia of South African **diamond wire saw** at the Bullen Mine for high-grade pillar recovery
* Introduction and successful implementation of a new **TMU mining method** at the Bullen Mine. The TMU mining concept was aimed at reduction of dilution and employed a **Swedish-built** diesel powered hydraulic mini-jumbo and an unique mining method designed to gradually phase-out airleg mining in a narrow-vein type deposits *(the TMU mini-jumbo level-driving concept provided by Vic Birmingham and Charles McHugh after their trial at WMC’s Otter-Juan Nickel Mine in Kambalda)*
* Design and practical implementation of the TMU mining performance improvement program *(in March 2000* ***achieved 193m/month of ore driving at the Bullen Mine with a prototype mini-jumbo TMU unit****).*
  + Design and successful implementation of a TMU ore driving profile to reduce ore dilution, including accommodation of vent bag in ore
* Design and practical implementation of **Australia-first one-pass** **separation blasting** in ore drives aimed to significantly increase the mined grade
* Implemented **Australia-first** cemented grout packs/artificial pillars
* Implemented **Australia-first** jack-pots in airleg stoping
* Implemented stopes wash-downs with water

##### Manager Technical Services *(1999 to 1999)* – Reported to General Manager

**Responsible for:**

* Management of technical services department supporting the mining operations.
* Personnel reporting to me:
  + Chief/Senior Mine Surveyor
  + Senior Geotechnical Engineer
  + Mine Projects Mining Engineers

##### Manager Mining *(1997 to 1999)* – Reported to General Manager

**Responsible for:**

* Achieving budgeted production and development targets in a cost effective and safe manner, in a gold operation comprising three (3) underground decline accessed mines – Bullen, Harlequin and OK and one (1) open pit
* Open pit mines run at the time *(Lady Miller and Hit & Miss Projects, both mined by MacMahon Mining Contractors)*
* Management of a mining team in excess of 150 employees, including 35 multi-disciplinary professional staff
* Management of operating and capital budget in excess of 45 million dollars per annum
* Liaison with geology, OH&S, metallurgy, engineering and other departments to ensure effective and efficient running of mining operations and achievement of longer term sustainability
* Feasibility study and evaluation of new mining projects

**Achievements:**

* Initiation and successful implementation of a three-panel continuous mining roster in a highly conservative mining environment in Norseman
* Successful motivation of a highly conservative underground workforce employed under then innovative salary/workplace agreements
* Initiation and installation of **WA first** Sat-stat underground diesel equipment re-fuelling system at the Bullen Mine
* Initiation and fast implementation of **WA first** centralized firing system underground at the Bullen Mine *(locally designed in Norseman)*
* Introduction of **WA first** underground explosives magazine with comprehensive delivery/stock control at the Bullen Mine *(with Orica)*

WMC Resources Limited, Kambalda Nickel Operations *(KNO)* 1992 to 1997

Kambalda, Western Australia

**Long Victor Nickel Complex (1995 to 1997)**

##### Registered Mine Manager (1996 to 1997) – Reported to Mining Manager - North

Long Victor Complex was a two-mine *(Long Shaft and Victor Decline)*, high-grade, underground operation employing variety of mining methods and equipment, including conventional airleg cut and fill *(hydraulic),* single boom jumbo cut and fill *(both hydraulically and mechanically placed; and cemented waste fill)*, two-boom jumbos and longholes, operating on both 7.5 hour and continuous 12 hour continuous roster. In October 1996, Eltin Underground Mining Contractors were engaged to replace the owner/operator system. **The two mines were highly seismically active.**

Combined Long Shaft and Victor Decline operation produced 500,000 tonnes of high-grade ore and generated 300,000 tonnes of waste per year from mine development.

The annual **nickel** production of Long-Victor Complex was **16,000 tonnes** or more than **40%** of total KNO production of **nine (9)** underground WMC mines operating in Kambalda region.

* KNO then produced **>37,000 tonnes** of Ni/year

**Responsible for:**

* Achieving budgeted development and production and targets in a costs effective manner in Kambalda Nickel Operations’ *(KNO)* biggest nickel producer, operated by Eltin Underground Contractors Ltd
* Feasibility studies, evaluations, negotiations and Owner Operator to Contractor change-over
* All aspects of managing the Contract as a Company Representative
* Management of the operating and capital budget in excess of 50 million dollars per annum
* Management of personnel in excess of 200 including 40 multidisciplinary professional and supervisory staff
* Holding statutory responsibilities as Registered Mine Manager under the WA Mines Safety and Inspection Act 1994
* Management of introduction and implementation of seismic monitoring systems and procedures

##### Underground Manager *(1995 to 1996)* – Reported to Mining Manger - North

**Responsible for:**

* Achieving budgeted development and production targets in a costs effective and safe manner in Kambalda Nickel Operations’ *(KNO)* biggest nickel producer operated by WMC own workforce
* Management of operating and capital budget in excess of 50 million dollars per annum
* Management of personnel in excess of 200 including 45 multidisciplinary professional and supervisory staff
* Holding statutory responsibilities as Underground Manager under the WA Mines Safety and Inspection Act 1994

**Achievements:**

* Initiation and successful implementation of a **270%** productivity improvement of the single-boom jumbo crews employed on a flat rate/salary payment system ***(with no pay increase).***
* Initiation and introduction of smaller mining equipment and profiled excavations to reduce ore dilution in then employed single-boom jumbo flat-back cut and fill mining method

**Coronet Nickel Mine *(1995 to 1995)***

##### Underground Manager – Reported to Mining Manager – North

**Responsible for:**

* Feasibility study, design and the start-up of a new underground nickel mine developed from an old underground mine.
* Holding statutory responsibilities as Underground Manager under the WA Mines Safety and Inspection Act 1994.

**Achievements:**

* Design and successful implementation of a jumbo development contract with then innovative concept of remuneration based on a 75% base flat rate and 25% based on performance.
* **293m per month** on average were achieved in **a single heading** when jumbo-developing a 5.5m x 5.5m Coronet Decline in 1995-1996.

**Victor Nickel Mine *(1994 to 1995)***

##### Underground Manager – Reported to Mining Manager – North

A surface decline accessed Victor Mine, was a highly productive nearly fully mechanised underground operation, utilising single boom jumbos and flat-back cut and fill mining method in narrow vein stopes, operating on a 12hour shift continuous mining roster. The use of cemented waste floor pillars enabled 100% ore extraction and the introduction of unique mechanised mining techniques resulted in ore grades equal to those achieved by traditional airleg cut and fill mining. Victor Mine was then one of Kambalda’s lowest mining costs nickel producers with **less than Aus$0.55/lb Ni.**

**Responsible for:**

* Achieving budgeted development and production targets in a costs effective and safe manner in Kambalda Nickel Operations *(KNO)* second biggest nickel producer operated by WMC own workforce, delivering ~8,000 tonnes of nickel per year.
* Management of operating and capital budget in excess of 15 million dollars per annum.
* Management of personnel in excess of 60 including 10 professional and supervisory staff.
* Holding statutory responsibilities as Underground Manager under the WA Mines Safety and Inspection Act 1994.

**Achievements:**

* Introduction and successful implementation of **Australia-first** reduced length single-boom jumbo rail for narrow-vein mining in a flat-back cut & fill mining *(initial concept provided by Nick Cernotta; implementation together with Victor’s Mine Foreman Peter Death and Roger Trump of Versatech).*
  + The reduced length single boom jumbo rail allowed for much smaller cut & fill profile and significant reduction of dilution and significant reduction of overall costs *(~0.8m wide x 4.0m high waste on the footwall side was not mined, trucked, carted, milled and filled).*
* Construction and fast successful implementation of a “Mad-Max/Frog Mouth” bucket on a 3cu yard Eimco LHD to clean ore under the 55degree hanging wall *(together with Peter Death, Nick Supljeglav, Peter Nazzarri and Victor Mine Mining Team).*
* It had taken **~one (1) week** from the design stage to full implementation underground
* Introduction and fast/successful implementation of remote-control fibrecreting into the mining cycle in a seismically active mine – **first in Western Australia**
* Introduction of rock-burst resistant South African cone rockbolts – **first in Western Australia**

**Otter - Juan Nickel Mine *(1993 to 1994)***

##### Underground Manager – Reported to Mining Manager – North

Otter-Juan was a decline accessed mine with a haulage shaft. Ore was mined from a multiple, complex and varying in dip surfaces, employing variety of mining methods, including airleg room and pillar, airleg cut and fill *(both hydraulic and mechanically placed),* single boom jumbo cut and fill and long-holes.

Mine capital development was performed with twin boom jumbos.

**Responsible for:**

* Achieving budgeted development and production targets in a costs effective and safe manner in Kambalda Nickel Operations’ *(KNO)* second biggest nickel producer at the time, operated by WMC workforce.
* Management of operating and capital budget in excess of 15 million dollars per annum.
* Management of personnel in excess of 80 including 17 professional and supervisory staff.
* Holding statutory responsibilities as Underground Manager under the WA Mines Safety and Inspection Act 1994.

**Achievements:**

* Design and successful implementation of a strategic ventilation upgrade that allowed mining at the bottom levels (then down to 25 L).
  + 122m and 75m 3.5m diameter Alimak raises excavated from 25 L to 19 L and from 18L to 13 L respectively
* Maintaining highly productive, cost effective and harmonious relationships with **a highly unionised workforce without a single day of strike and no pay raises.**
* Feasibility study of the haulage shaft extension and introduction of electric trucks *(including visit to Sweden).* The Project was then subsequently cancelled by WMC’s upper management.
  + Otter-Juan mine is now 750 vertical meters deeper than in 1993-94 *(****now is ~1,500m deep).***

**Long Shaft Nickel Mine *(1992 to 1993)***

##### Assistant Underground Manager – Reported to Underground Manger Long - Victor Nickel Complex

**Responsible for:**

* Mine planning and design
* Overseeing mine planning engineers (3) and other technical staff (5)
* Budget, long term and short term forecast preparation
* Other duties as required by the Underground Manager
* Acting Underground Manager during the absence of Underground Manager

Department of Mines, Kalgoorlie Office, Western Australia 1989 to 1992

**District Inspector of Mines *(Metalliferous)***

1. **District Mining Engineer; Deputy Regional Mining Engineer** *(since 1991)*
2. **Appointed Departmental Inspector of Mines *(Coal)***

**Responsible for:**

* Exercising the statutory powers of a District Inspector of Mines under the Mines Regulation Act and Regulations
* **>25** gold and nickel mines were within my district’s jurisdiction
* Administration of the matters relating to Mining Act
* Advising and assisting company management
* Investigation of mining accidents
* Court appearances at Coroner’s inquests
* Acting Regional Mining Engineer and Senior Inspector of Mines during absence of Regional Mining Engineer and Senior Inspector of Mines *(since 1991)*

Kambalda Nickel Operations, Western Mining Corporation Ltd, 1989 (7 months)

Kambalda, Western Australia *(seconded from WA Department of Mines)*

**Long Shaft**

**Underground Labourer**

Hands-on underground mining experience prescribed by the Board of Examiners of Western Australian Department of Mines

**Practical experience:**

* Operating a rock drill on development and stoping faces and using explosives in charging and firing these faces
* General timbering
* Hydraulic sand-fill
* Platman/braceman duties including shaft inspections and repairs
* Mechanical loading *(rail-mounted)*

Department of Mines, Karratha, Western Australia 1987 to 1989

**Special Inspector of Mines *(Ventilation)***

1. **Senior Ventilation Officer**

**Responsible for:**

* Exercising the powers of a Special Inspector of Mines *(Ventilation)*
* Examination and inquiry to ascertain whether the provisions of those sections of the Mines Regulation Act and Regulations relating to Ventilation, Occupational Health and Diesel Engines were being complied with
* Conducting dust sampling, samples weighing and ventilation surveys on both open pit and underground operations located in the north part of Western Australia and stretching across ~1,500km
* Advising and assisting companies management
* Accidents and incidents investigation

Forklift Engineering *(Aust.)* Pty Ltd, Melbourne, Australia 1986 to 1987

**Design Engineer**

**Responsible for:**

* Designing of one-off, custom-made attachments for forklift trucks
* Direct liaison with members of fabrication team to ensure fault-free and accelerated construction

**Achievements and main projects:**

* **Extend-a-fork** **(*first one in Australia*),** slip-on hydraulic scoop, container handlers, flameproof systems for forklift trucks used in underground coal mines and many others.

**Regional Mines Rescue Station, Walbrzych, Poland 1981 to 1985**

**Superintendent**

**Shift responsibility for:**

* All aspects of mines rescue in an underground coal mining region with four (4) large underground coal mines operating under extremely difficult gas *(CO2 and CH4)* and rock outbursts conditions, with more than **25,000** people employed underground.
* Inspections of mines rescue facilities, systems and procedures on the mines located in the region
* Conducting of mines rescue courses and training for mine rescue team members, mine rescue equipment mechanics and mine management
* Personally trained more than two hundred *(200)* mines rescue personnel
* Took active part in a number of mine emergency and recovery operations, including cave-ins, gas and rock outbursts, underground fires and sealing off operations with multiple fatalities

Walbrzych Underground Coal Mine, Poland 1977 to 1981

The Walbrzych colliery was **~1km** deep, employing **6,500** people underground with serious CO2 and CH4 outbursts challenges and was located in the south-west part of Poland.

**Acting Section Manager**

Supervision, direction and control of a total labour force of three hundred and twenty *(320)* persons *(including 11 supervisory and clerical staff)* producing coal by longwall mining method under difficult gas and geological conditions

**Mine Foreman**

Supervision and control of a labour force of one hundred (100+) persons and three (3) supervisory staff producing coal by longwall mining method under condition of methane and rock outburst hazards.

**August 1978 – August 1979**

National Service with the Polish Army including six (6) months studies at the Torun Artillery Academy and Platoon Commander in an artillery unit in the field. Graduated as a Lieutenant Grade 1.

**Underground Supervisor *(Deputy)***

Supervision and control of a labour force of thirty (30) persons producing coal by longwall mining method under conditions of methane and rock outbursts hazards.

Obtained experience leading to statutory examination by Regional Mining Authority prior to obtaining of Underground Supervisor’s Certificate of Competency, Grade 2.

**Graduate Mining Engineer**

Practical underground mining training in mine with methane and rock outbursts hazards leading to statutory examination by the Regional Mining Authority prior to obtaining Underground Supervisor’s Certificate of Competency, Grade 1.

**PUBLICATIONS**

1. Why Do Shareholders and Mining Executives Allow Mine Managers to Leave Behind High-Grade Broken Ore Underground? Proceedings of the Australian Institute of Mining and Metallurgy (AusIMM) International Narrow Vein Mining Conference, Perth Western Australia, 26-27 March 2012.
2. Recovery of Broken Ore Stocks Left on the Mine Floor and Other Applications of Underground Mobile Supersucker”, Proceedings of the AusIMM Narrow Vein Mining Conference, Ballarat, Victoria, Australia, 14-15 October 2008. (Member of the Conference’s Organising Committee).
3. “Lowering Orebody Risk in Complex Gold Veins – Application of Underground Mobile Supersucker Winzing”, Proceedings of the 5th International Mining Geology Conference, Bendigo, Australia, November 2003 *(with Dr Simon Dominy).*
4. “Attaining Proven Reserves Prior to Capital Commitment”, the Australian Institute of Mining and Metallurgy *(AusIMM)*, Proceedings of the Underground Operators’ Conference, Townsville, Australia, July 2002.
5. “One-pass Separation Blasting at CNGC Bullen Mine” – WMC Mining Conference, 7-8 October 1999, Kalgoorlie, Western Australia.
6. “Alternative Mine Access, Mining and Hoisting System for Underground Deposits”,Balkema, Proceedings of the 9th International Symposium on Mine Planning and Equipment Selection, Athens, Greece, November 2000.
7. Title as above, the Australian Institute of Mining and Metallurgy, Proceedings of the MassMin2000 International Conference, Brisbane, Australia, November 2000.
8. Underground Supersucker Winzing - Defining the Mining Environment”, Balkema, Mining in the New Millennium – Challenges and Opportunities, Proceedings of the American-Polish Mining Symposium, Las Vegas, Nevada, USA, October 2000.

EDUCATION

1972 - 1977 Technical University of Wroclaw, Poland

Department of Mining *(five-year Masters Course)*

1984 - 1985 Silesian Institute of Technology, Gliwice, Poland

Department of Mining

Post-graduate Course in Mine Ventilation

ACADEMIC QUALIFICATIONS

Bachelor Degree in Mining Engineering *(Honors)*

PROFESSIONAL QUALIFICATIONS

Member of Australasian Institute of Mining and Metallurgy since 1992 - No. 110770

SPECIAL COURSES

1. Various Senior Management Courses
2. SAP Integrated Management System
3. Contract Management Courses and Training
4. Various Safety Courses
5. Various Accident Investigation Courses
6. Computer Courses (Excel, Word, Typequick, Power Point, Microsoft Project )
7. Rock Mechanic Courses
8. Mine Blasting Courses
9. Mines Rescue Courses
10. Datamine
11. Whittle open pit optimisation

**MINING EXPERIENCE PRIOR TO GRADUATION**

All vocational practices as a student (total of 5 months) and practical experience towards final thesis *(5 months)* were worked in mines of Lubin Industrial Complex of Copper Mining and Metallurgy *(KGHM)* in Poland, **one of the world’s largest underground copper and silver mining districts**.

The world class Complex comprises four (4) large scale deep underground mines extracting semi-horizontal copper ore body by mechanised room and pillar method of a combined output of more than 30 million tonnes of ore per annum, producing in excess of 500,000 tonnes of copper and 900 tonnes of silver per year.

**Achievements:**

* Analysis of underground ore handling and transportation systems
* Projects on rock-bolting systems
* Projects on pillars stability and rockbursts analysis
* Ventilation measurements and analysis
* Practical use of trackless underground diesel equipment

ADDITIONAL INFORMATION

**Citizenship**

1. Australian *(since 1988)*

**Languages**

a. English - fluent

b. Polish - native tongue

c. Russian – fluent - **no interpreters required**

**Marital Status**

* Just married in February 2017; No children

**Licences and Permits**

1. **Western Australian First Class Mine Manager’s Certificate of Competency *(Metalliferous)* No 284, 1989**
2. **Western Australian First Class Mine Manager’s Certificate of Competency (Coal) No A-1-89, 1989**
3. Underground Supervisor’s Certificate of Competency, Grade 1. Regional Mining Authority, Walbrzych, Poland
4. Underground Supervisor’s Certificate of Competency, Grade 2. Regional Mining Authority, Walbrzych, Poland
5. Western Australian Driving License No. 3473215

**Interests**

* Bike riding/fitness
* Healthy cooking
* Wine making
* Sculpture
* Wooden furniture making

CONTACT

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**Website: www.ausvacmining.com.au**

**REFEREES**

Names and current contacts of Referees are available on request *(in Australia, Russia, Kazakhstan and Ghana)*