

**SUPPLY CHAIN AUDIT SUMMARY
POLYMETAL INTERNATIONAL PLC
VORO SUPPLY CHAIN - TNT**

MAY 2019



Prepared by

WARDELL ARMSTRONG INTERNATIONAL

**Sir Henry Doulton House, Forge Lane, Etruria
Stoke on Trent, Staffordshire, United Kingdom**

www.wardell-armstrong.com



SUMMARY AUDIT REPORT

Name of Operation: Polymetal Voro - Supply Chain
Name of Mine Owner: Polymetal International PLC
Name of Mine Operator: Polymetal International PLC
Name of Responsible Manager: Daria Goncharova
Address: Polymetal, Prospect Narodnogo, Opolcheniya 2
State/Province: St Petersburg
Country: Russia Telephone: +7 812334 3666 Fax: +781 27536376
E-Mail: Goncharova@polymetal.ru

Summary

Background and Location

Voro is located in Russia's Sverdlovsk region, approximately 370 km north of the regional centre of Ekaterinburg (population of 1.5 million) and 25 km south of the city of Krasnoturinsk (population of 65,000). Voro is easily accessible from Ekaterinburg via the federal highway that runs 7 km from the site. The industrialised and moderately populated area around the deposit is home to several mining companies, ensuring good access to the grid and other infrastructure. In addition, there is good railway access with a Group-owned spur located 18 km from the site.



Figure 1:1 Sverdlovsk Region, Russia

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Figure 1:2 Supply Chain

Supply Chain Overview

Polymetal (St Petersburg Office) purchases the sodium cyanide for all its mining operations including Voro. Polymetal have signed a 5 year contract with Tongsoh Petrochemical Corp, South Korea (Tongsoh) and Hyosong Corporation, South Korea (Hyosong). Both Tongsoh and Hyosong are signatories of the Code and have full compliance status.

The cyanide for Voro mine enters Russian via the port of St Petersburg.

St Petersburg port is the largest industrial marine port in Russia and holds an operating license for the importation of Dangerous Goods (DGs). St Petersburg port works under the auspices of the International Maritime Organization (IMO) is the United Nations specialized agency with responsibility for the safety and security of shipping and the prevention of marine and atmospheric

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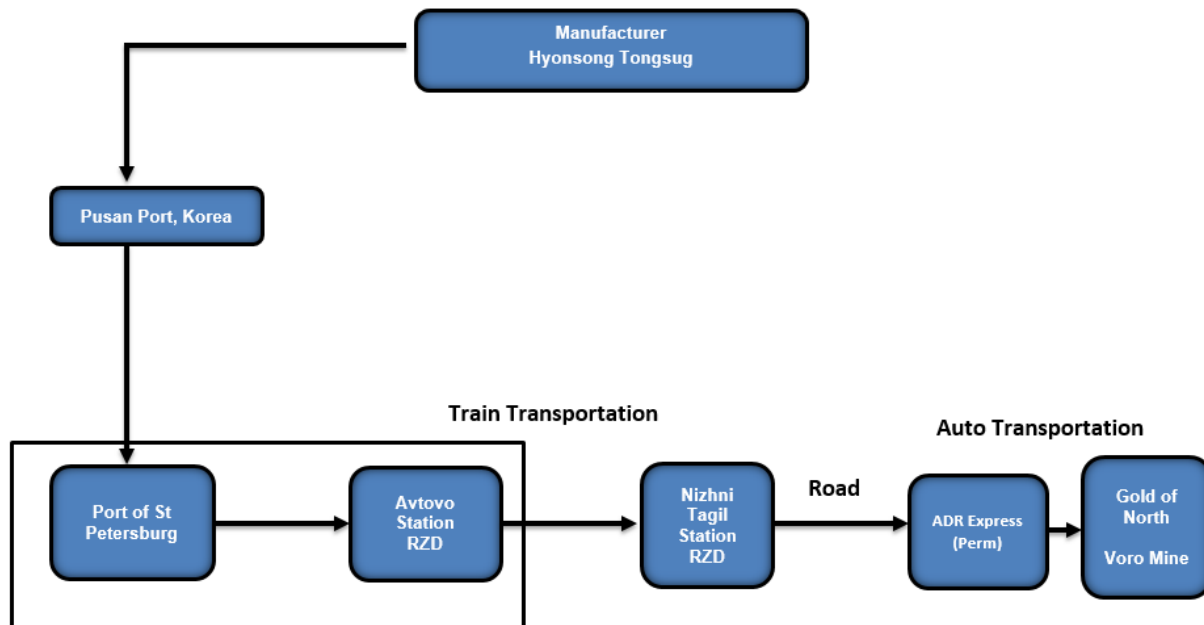
pollution by ships. IMO's work supports the UN SDGs. The Russian Federation (RF) has been a member since 1958.

As with all seaports in Russia, including privately owned ones, the access to the DG storage areas are prohibited. The Auditor was not able to secure passes to enter the commercial side of the port, however research, discussions and understanding of how the port operates, the Auditor has no doubt that the port would be compliant with the Code requirements. The research undertaken by the Auditor is summarized in Appendix A of this report.

The cyanide is off loaded in St. Petersburg Port, by the Stevedores and taken to the Dangerous Goods (DG) storage area within the port boundary to await customs clearance before being loaded on to Russian Rail (RZD) station on flat-bed rolling stock to Nizhny Tagil.

TNT supervise the unloading with RZD staff and co-ordinate the uploading to ADR Express (ADR) vehicles, so that the cyanide is not stored at Nizhny Tagil station.

Polymetal employs TNT (office located in Nizhny Tagil) and ADR Express (office/depot located in Perm) to organize the transportation of cyanide to Voro. TNT prepare all the importation documentation and customs requirements. They also act as the liaison between RZD, ADR and Voro. TNT do not have any vehicles themselves. The Supply Chain audit included verification of St. Petersburg port for the handling (loading and unloading of cyanide from ship to rail cars (flat bed for containers). Rail transport to Nizhny Tagil, transfer to ADR vehicles for onward and final journey to Voro. See Figure 1:3 below.



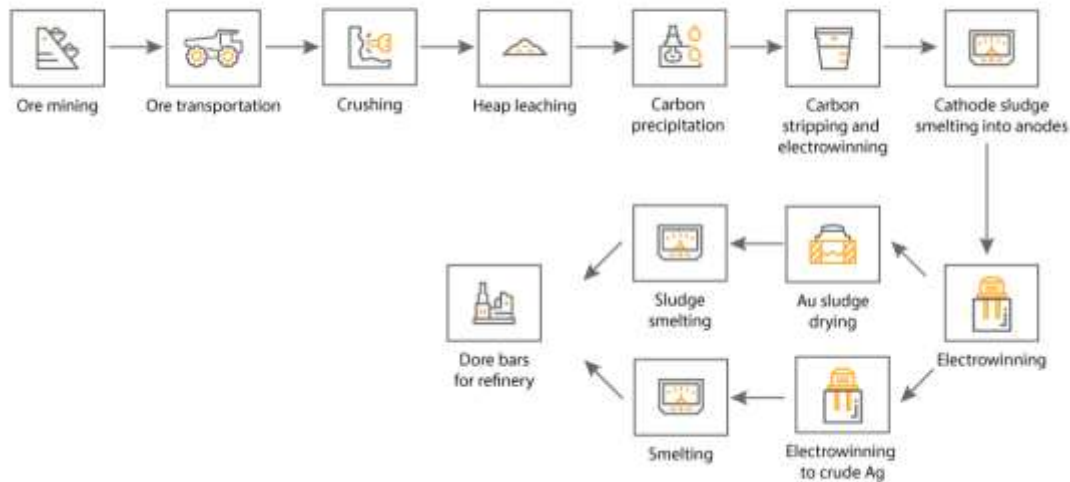
SUMMARY AUDIT REPORT
Figure 1:3 Supply Chain Flow Chart

Operational Overview

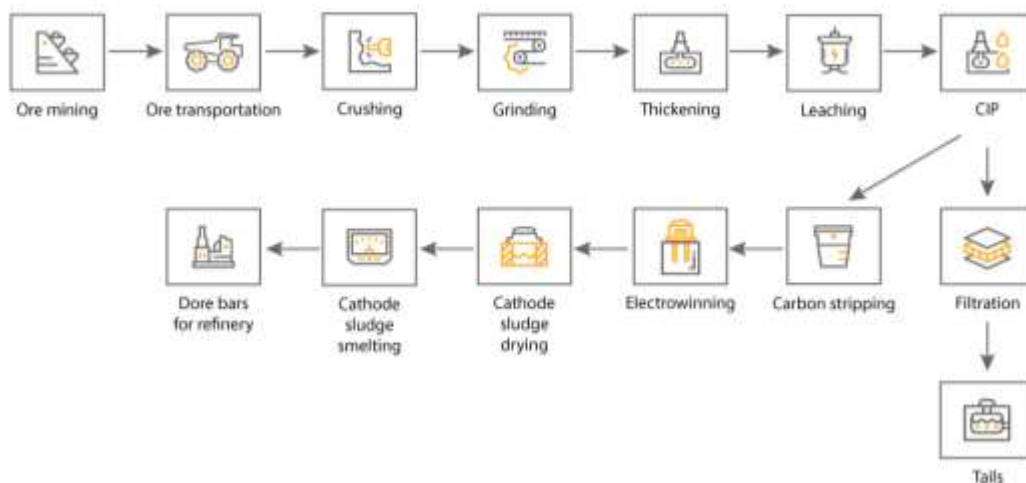
Voro is one of Polymetal’s very first key gold assets acquired in 1998. Voro comprises an open-pit mine, a 950 Ktpa carbon-in-leach processing plant and a seasonal 1000 Ktpa heap leach circuit that accommodate the processing of both primary and oxidised ore.

The process plant is fully automated; Figures 1:4 below are the flow sheets for the primary ore and oxidised ores.

Voro Block Flow Diagram for oxidised ores
(Heap leaching)



Voro Block Flow Diagram for primary ores
(Carbon-in-Pulp Plant)



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Figure 1:4 Schematic Process Flow Sheets for the Primary Ore and Oxidised Ores

The process plant operates as per the illustrative flow sheet (Figure 1.4). Tailings produced from the gold recovery process are sent to the filtration system, where the filtrate is collected and re-circulated in the process (closed loop system). The filter cake dry tailings are deposited in the Tailings Storage Facility (TSF). The TSF is geosynthetically lined with a 1.5mm HDPE geomembrane. Surface water runoff from the tailings is captured and flows to the "surface water runoff pond", and flows to the water treatment plant before being discharged.

The oxidised ore uses a heap leach system, where by cyanide solution is drip fed onto the ore rock in order to liberate the gold into solution. This is collected via numerous collection pipes and drains into collection ponds from where it enters into the process plant for gold recovery. All residue solution is collected within the plant and re-used in the cyanide circuit (closed loop). The cyanide is received in St Petersburg port from South Korea. St Petersburg port holds a license for the importation of Dangerous Goods (DGs), which includes cyanide.

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Auditor's Finding

This operation is

- in full compliance
- in substantial compliance *(see below)
- not in compliance

with the International Cyanide Management Code.

Audit Company: Wardell Armstrong International (WAI Ltd)

Audit Team Leader: Christine Blackmore

E-mail: cblackmore@wardell-armstrong.com

Names and Signatures of Other Auditors:

Date(s) of Audit: Site visit 17-24 November 2018

I attest that I meet the criteria for knowledge, experience and conflict of interest for Code Verification Audit Team Leader, established by the International Cyanide Management Institute and that all members of the audit team meet the applicable criteria established by the International Cyanide Management Institute for Code Verification Auditors.

I attest that this Summary Audit Report accurately describes the findings of the verification audit. I further attest that the verification audit was conducted in a professional manner in accordance with the International Cyanide Management Code Verification Protocol for Cyanide Transportation Operations and using standard and accepted practices for health, safety and environmental audits.

Voro Gold Mine Supply Chain –
TNT



May 2019

Voro Gold Mine Supply Chain -
TNT



May 2019

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1. TRANSPORT: Transport cyanide in a manner that minimizes the potential for accidents and releases.

Transport Practice 1.1: *Select cyanide transport routes to minimize the potential for accidents and releases.*

The operation is in full compliance with
 in substantial compliance with Transport Practice 1.1
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

TNT prepare all the documentation during the transportation of cyanide.

Transport Practice 1.2: *Ensure that personnel operating cyanide handling and transport equipment can perform their jobs with minimum risk to communities and the environment.*

The operation is in full compliance with
 in substantial compliance with Transport Practice 1.2
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

TNT provided sufficient information to demonstrate full compliance with Transport Practice 1.2 and has necessary procedures and training whereby TNT personnel involved with the cyanide handling operations performed by RZD are able to perform their jobs with minimum risk to communities and the environment and abide by the rules established by RZD and the Russian Federation Authorities (RFA).

Transport Practice 1.3: *Ensure that transport equipment is suitable for the cyanide shipment.*

The operation is in full compliance with
 in substantial compliance with Transport Practice 1.3
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

TNT prepare all the documentation during the transportation of cyanide. It is the responsibility of Russian Rail and ADR to provide and maintain their transportation equipment.

The operation is in full compliance with
 in substantial compliance with Transport Practice 1.3
 not in compliance with

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Transport Practice 1.4: *Develop and implement a safety program for transport of cyanide.*

The operation is in full compliance with
 in substantial compliance with Transport Practice 1.4
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

All shipping containers are sealed and have a unique seal number. The seal numbers are recorded on all documentation eg consignor notes and bill of lading, that accompany the cyanide cargo to the final destination, Voro mine site.

Two licensed security guards travel with the cyanide cargo during the rail journey to the final rail terminal, where it is unloaded under supervision by TNT personnel. The containers are checked for damage, signage, placards and seal numbers, before being up loaded on to ADR Express vehicles.

TNT keep a copy of all consignment notes both as hard copies and electronic versions.

All TNT employees are required to produce a certificate from a drug abuse clinic and medical card, before being inducted by TNT Manager to supervise the handling of dangerous cargos.

Transport Practice 1.5: *Follow international standards for transportation of cyanide by sea and air.*

The operation is in full compliance with
 in substantial compliance with Transport Practice 1.5
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified: N/A

No marine or sea transport is included in the supply chain.

Transport Practice 1.6: *Track cyanide shipments to prevent losses during transport.*

The operation is in full compliance with
 in substantial compliance with Transport Practice 1.6
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

TNT uses ETRAN electronic system to track the cyanide cargo. TNT start their tracking at the first rail depot and until the final destination of Voro mine by road. Consignment notes and bills

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of lading accompany the cyanide cargo. These are reviewed at each interval where the cargo moves from one supply chain member to the next. These are checked, date stamped and signed. Material Safety Data Sheets (MSDS) accompany the cyanide cargo during all the transport route.

2. INTERIM STORAGE: *Design, construct and operate cyanide trans-shipping depots and interim storage sites to prevent releases and exposures.*

Transport Practice 2.1: *Store cyanide in a manner that minimizes the potential for accidental releases.*

The operation is in full compliance with
 in substantial compliance with Transport Practice 2.1
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Sufficient information has been provided to the auditor to establish full compliance of TNT with Transport Practice 2.1. TNT abides by the safety procedures developed by RZD aiming to prevent accidental cyanide releases and exposures. Likelihood of accidental cyanide releases is minimal because cyanide is transported in sealed containers apropos UN design and specifications. TNT, RZD and ADR consider the delivery of cyanide, so no storage is undertaken by RZD.

3. EMERGENCY RESPONSE: *Protect communities and the environment through the development of emergency response strategies and capabilities*

Transport Practice 3.1: *Prepare detailed emergency response plans for potential cyanide releases.*

The operation is in full compliance with
 in substantial compliance with Transport Practice 3.1
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

TNT has provided a comprehensive Emergency Response Plan (ERP), and is appropriate for the selected route and modes of transport (rail and road). The ERP has been prepared in conjunction with RID, ADR and RZD Emergency Card 619.

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The ERP considers the physical and chemical form of cyanide and includes emergency response actions as necessary for rail and road, it provides “cards” containing different emergency scenarios actions to be taken, roles and responsibilities for both internal and external responders.

Transport Practice 3.2: Designate appropriate response personnel and commit necessary resources for emergency response.

The operation is in full compliance with
 in substantial compliance with Transport Practice 3.2
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

TNT provide emergency response training to all employees representing the company for Dangerous Goods (DGs). The ERP “Cards” contains details of roles and responsibilities in cases of emergency. Emergency response equipment is described in the H&S rules and instructions. TNT has its own emergency equipment which is also available at the station. TNT does not participate in the transportation of cyanide but is responsible for observing emergency response measures established at the station by RZD.

TNT employees personnel receive periodic refresher training in emergency response procedures, with an upgrade of a professional qualification every three years. TNT inspects its own emergency response equipment and this is also undertaken by RZD.

Transport Practice 3.3: Develop procedures for internal and external emergency notification and reporting.

The operation is in full compliance with
 in substantial compliance with Transport Practice 3.3
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Emergency response readiness is maintained in a manner applicable to TNT as a paperwork agent who seldom operates on RZD’s area. Sufficient information and evidence has been provided to the auditor to establish full compliance of RZD with Transport Practice 3.3.

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Transport Practice 3.4: *Develop procedures for remediation of releases that recognize the additional hazards of cyanide treatment chemicals.*

The operation is in full compliance with
 in substantial compliance with Transport Practice 3.4
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

In case of an emergency occurring on the territory of RZD's Nizhny Tagil Station, TNT is guided by the Emergency card 619. Emergency cards contain relevant data on cyanide properties and emergency response measures. TNT is not allowed to undertake any remediation actions or use any chemicals during or post emergency. Procedures for neutralisation and remediation of releases are implemented at RZD and recognize the additional hazards of cyanide treatment chemicals, contact of cyanide with water and other hazards. Agreements between RZD and specialised emergency response organisations are in place as an additional measures. TNT is therefore fully compliant with Transport Practice 3.4.

Transport Practice 3.5: *Periodically evaluate response procedures and capabilities and revise them as needed.*

The operation is in full compliance with
 in substantial compliance with Transport Practice 3.5
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

TNT have procedures in place to review and evaluate their ERP, this includes any new pieces of legislation. Mock drills have taken place, TNT are observers nevertheless they make comments and update their ERP as necessary and share this with the local RZD station receiving DGs.

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APPENDIX A

St Petersburg Port Due Diligence Summary

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St. Petersburg Port Due Diligence Summary

The Auditor undertook a limited Due Diligence investigation of St Petersburg Port on behalf of the Polymetal Voro supply chain. Restrictions are in place for visits to the container terminals and especially the Dangerous Goods storage area. Having undertaken a desk review, discussions with Polymetal representatives and the Auditors knowledge of auditing Ports, the Auditor has no reason to suggest that St Petersburg Port would not be compliant with the ICMI Code requirements. Below is a brief outline of how compliance was demonstrated.



Location of St Petersburg Port on the Baltic Sea

Background

Polymetal purchases their cyanide from Tongshu, Korea and uses Hyosung, Korea to manage the shipping and documentation logistics. St Petersburg port works under the auspices of the International Maritime Organization (IMO) is the United Nations specialized agency with responsibility for the safety and security of shipping and the prevention of marine and atmospheric pollution by ships. IMO's work supports the UN SDGs. The Russian Federation (RF) has been a member since 1958. St Petersburg port is the largest industrial marine port in Russia and holds an operating license for the importation of Dangerous Goods (DGs).

The cyanide is off loaded in St. Petersburg Port, by Stevedores and taken to the Dangerous Goods (DG) storage area within the port boundary to await customs clearance before being loaded on to Russian Rail (RZD) station on flat-bed rolling stock to Nizhny Tagil. The Stevedores are specialised in container-handling operations.

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Container Terminal, St. Petersburg Port

The Port of St. Petersburg's container facility covers an area of 89 hectares. The Port is equipped with eight 50-ton STS Panamax cranes, one 104-ton mobile crane, three 45-ton RMG cranes, 19 50-ton rubber-tyred gantry cranes, 37 straddle carriers, and a fleet of reachstackers, terminal tractors, and empty-handlers. The operation of the cranes and equipment is specialised and would require licenses from the Russian Federation Authorities. Having undertaken qualification checks at other ports and railway terminals using cranes, the Auditor has no doubt that the crane operators are qualified, experienced and trained accordingly.

St. Petersburg's container terminal provides a variety of services that include loading and unloading of all types of containers to and from ships and railway platforms, storing containers (including refrigerated containers), moving containers for both customs and veterinary inspections, and conducting pre-trip inspections and weighing containers. The weight of a cyanide container is provided on the consignment notes.

The Port has a storage capacity for ten thousand full and 4500 empty 20' containers (TEUs - Twenty-Foot Equivalent Unit). The port has 1757 meters in two rail tracks for container block trains and 422 meters (1384 feet) in one rail track with a covered platform for ten container rolling stock within the port area.

International Maritime Organisation (IMO) Member State Audit Scheme

The IMO Member State Audit Scheme is intended to provide an audited Member State with a comprehensive and objective assessment of how effectively it administers and implements those mandatory IMO instruments which are covered by the Scheme and also incorporates the following treaties and amendments:

- SOLAS, 1974, as amended (adding a new chapter XIII);
- the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, and the Seafarers' Training, Certification and Watchkeeping (STCW) Code;
- the Protocol of 1988 relating to the International Convention on Load Lines, 1966 (1988 Load Lines Protocol), as amended.

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The amendments make the auditing of Member States (RFA) (St Petersburg Port) mandatory, from 2016. The objects of the audit scheme are to ensure that the guidelines provided by the IMO including the IMDG are in place.

The scheme addresses issues such as conformance in enacting appropriate legislation for the IMO instruments to which a Member State is a Party; the implementation and enforcement of the applicable laws and regulations by the Member State; the delegation of authority to recognized organizations (ROs); the related control and monitoring mechanism of the survey and certification processes by the Member States.

Safety and Security

The Port takes seriously its responsibility to safety and security. The Port is securely fenced and has a restricted access. All employees and vehicles entering the port need to have a permit for entry and are security checked (searched) before being allowed entry. The IMDG chapter 1.4 discusses the preparation of a security plan and the elements required in that documentation. IMDG section 1.4.2.3 “security training” explains “*Security awareness training should address the nature of security risks, recognizing security risks, methods to address and reduce risks and actions to be taken in the event of a security breach. It should include awareness of security plans commensurate with the responsibilities of individuals and their part in implementing security plans*”. The Auditor has no reason to suspect that security plans, training and documentation are not in compliance with the IMDG requirements.

As a demonstration of Russia`s approach to its safety and security responsibilities the handling of DGs and bunkering at the Port of St Petersburg was suspended over a two month period around the FIFA World Cup in 2018. The instructions were issued by The Harbor Master of St Petersburg port. The security measures apply to all modes of transport associated with the port including railroad, and to stevedoring companies, cargo terminals and bunker suppliers. Similar restrictions were also applied during 2017 (football), that transport and handling of dangerous goods and vessels carrying dangerous goods, classified by the IMDG Code Classes 1-7, were not permitted to enter the port of St. Petersburg. The Auditor believes that this is an proactive action to their responsibilities for safety and security of DGs.

Emergency Response

As with all Emergency Response (ER) requirements in Russia any accidents/incidents are notifiable to the Russian Civil Defense (RCD) who take control and manage all situations. I have no doubt that St Petersburg port will have an Emergency Response Plan which details the protocols and procedures necessary to inform the RCD and what initial response actions should be taken. In my experience of Port auditing in Russia and other countries, there is a designated ER team on site 24/7 and an ER main stations where equipment is located and other storage facilities in the port area. Medical facilities are available at the port 24/7. The Auditor has no doubt that the plans, ER training, equipment and facilities are not in place.

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Environmental awareness and protection

In 2018 St Petersburg port increased its investment into its environmental sustainability's by 31%. It also experienced a 12% increase in cargo throughput in 2018 to 7,7 million tonnes, however the port authority was able to reduce its environmental footprint in all major parameters, for example:

- modernization of environmental protection facilities;
- modernizing the port water environmental facilities;
- enhance waste water disposal system;
- overhauled some sections of the sewer;
- reduce the volume of waste per a tonne of handled cargo reduced by 24%; and
- improving “control measures for air quality compliance”.

As a demonstration of environmental responsibilities: increased air quality samples are in the sanitary protection zone. The monitoring was conducted by a specialized company, the analysis results confirmed the samples complied to air quality standards.

The port set itself a goal on reducing waste and prepared a waste management action plan, which monitored the generation and disposal of waste for 12 months. Following the results from the monitoring, a waste reduction strategy (re-cycling and re-use) was implemented. Findings show that the volume of waste has reduced by 24% and the gross volume by 14.6%. The Stevedore company (St Petersburg) have implemented a set of measures (studies and monitoring) to reduce their impact on the ecosystem, atmosphere, water and land resources for compliance with the rules and requirements of environmental and sanitary legislation.

Other environmental protection measures have included:

- use of the latest scientific and technical developments in the field of waste disposal. As a result of actions taken over the last two years the volume of emissions per ton decreased by 18% and the volume of enterprise's waste water decreased by 34%. In general, the volumes of emissions from controlled sources do not exceed the statutory maximum permissible emission levels;
- protection of water resources, including regular monitoring of coastal zone use, cleaning and waste water quality monitoring, monitoring of water quality in the port water area, bacteriological tests of sea water;
- maintenance and repair works are carried out at wastewater treatment facilities, storm drains sewage pumping stations, the external storm sewer system is being thoroughly cleaned. For its wastewater treatment facilities KTSP uses the latest sorption filters;
- automatic weather station and tools for measuring the levels of priority pollutants, the environmental stations provide round the clock monitoring of air quality during production activities and provide an opportunity to respond quickly if the maximum permissible emission levels are exceeded or in the event of adverse weather conditions within the scope of the approved action plan to regulate emissions.

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Although the above environmental protections do not directly affect the cyanide cargos, they do demonstrate that St Petersburg port are responsible operators and have measure in place to undertake environmental monitoring, therefore the Auditor has no concerns that the port would not be acceptable under the cyanide code guidelines.

In March 2018, Marine Environmental Pollution committee (MEPC) adopted the [MEPC.1/Circ.834/Rev.1](#) *Revised Consolidated Guidance for port reception facility providers and users*, which consolidates in a single document the Guide to good practice for port reception facility providers and users (MEPC.1/Circ.671/Rev.1) and four other circulars related to port reception facilities (MEPC.1/Circ.469/Rev.2, MEPC.1/Circ.644/Rev.1, MEPC.1/Circ.645/Rev.1 and MEPC.1/Circ.470/Rev.1).

IMO has recognized that provision of reception facilities is crucial for effective MARPOL implementation, and the MEPC has strongly encouraged Member States, particularly those Parties to MARPOL as port States, to fulfil their treaty obligations on providing adequate reception facilities. The Baltic sea forms part of the MARPOL protection, therefore St Petersburg will be encouraged to implement their guidance.

**SUPPLY CHAIN AUDIT SUMMARY
POLYMETAL INTERNATIONAL PLC
VORO SUPPLY CHAIN – RUSSIAN RAILWAYS**

MAY 2019



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SUMMARY AUDIT REPORT

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Name of Mine Operator: Polymetal Voro Supply Chain
Name of Responsible Manager: Daria Goncharova
Address: Polymetal, Prospect Narodnogo, Opolcheniya 2
State/Province: St Petersburg
Country: Russia Telephone: +7 812334 3666 Fax: +781 27536376
E-Mail: Goncharova@polymetal.ru

Summary

1.1 Background and Location

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Figure 1:2 Supply Chain

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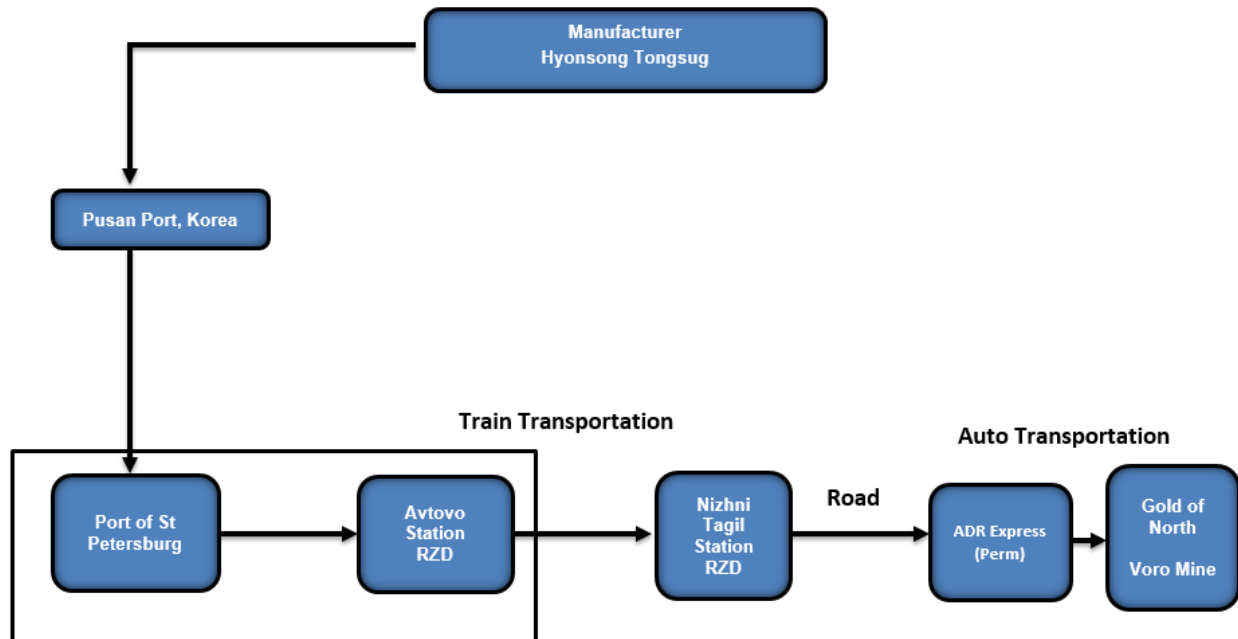
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Figure 1:3 Supply Chain Flow Chart

Operational Overview

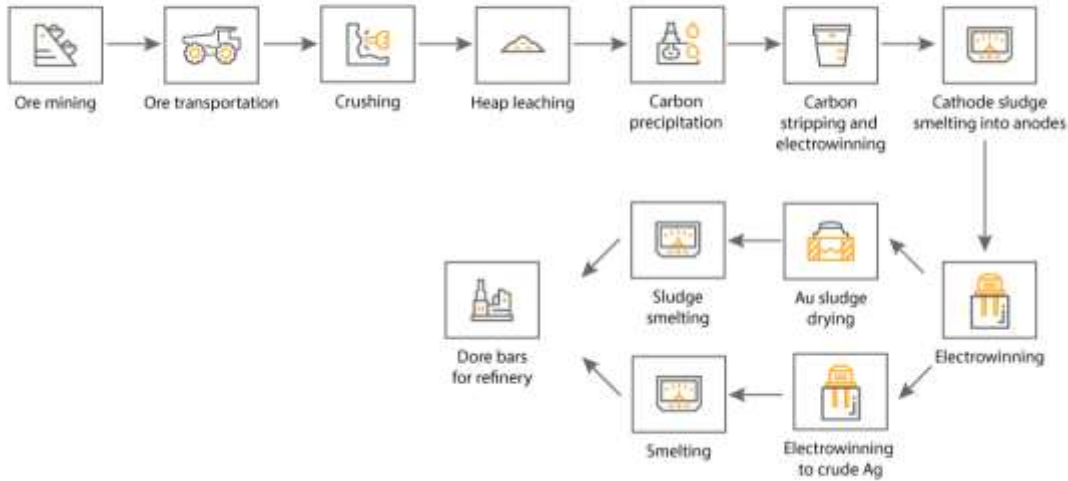
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Voro Block Flow Diagram for oxidised ores

(Heap leaching)



Voro Block Flow Diagram for primary ores

(Carbon-in-Pulp Plant)

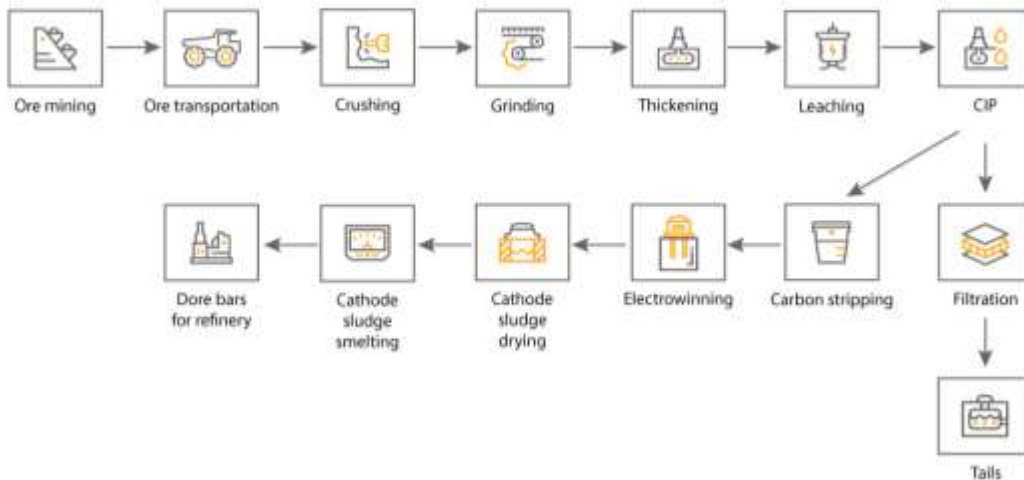


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The oxidised ore uses a heap leach system, where by cyanide solution is drip fed onto the ore rock in order to liberate the gold into solution. This is collected via numerous collection pipes and drains into collection ponds from where it enters into the process plant for gold recovery. All residue solution is collected within the plant and re-used in the cyanide circuit (closed loop).The cyanide is received in St Petersburg port from South Korea. St Petersburg port holds a license for the importation of Dangerous Goods (DGs), which includes cyanide.

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Auditor's Finding

This operation is

- in full compliance
- in substantial compliance *(see below)
- not in compliance

with the International Cyanide Management Code.

Audit Company: Wardell Armstrong International (WAI Ltd)

Audit Team Leader: Christine Blackmore

E-mail cblackmore@wardell-armstrong.com

Names and Signatures of Other Auditors:

Date(s) of Audit: Site visit 17-24 November 2018

I attest that I meet the criteria for knowledge, experience and conflict of interest for Code Verification Audit Team Leader, established by the International Cyanide Management Institute and that all members of the audit team meet the applicable criteria established by the International Cyanide Management Institute for Code Verification Auditors.

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Voro Gold Mine Supply Chain –
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SUMMARY AUDIT REPORT

1. TRANSPORT: *Transport cyanide in a manner that minimizes the potential for accidents and releases.*

Transport Practice 1.1: *Select cyanide transport routes to minimize the potential for accidents and releases.*

The operation is in full compliance with
 in substantial compliance with Transport Practice 1.1
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Russian Railways (RZD), select the most appropriate route for the train journey, this is then submitted to the Russian Federation Authorities (RFA) for approval. The route does take into account population density, infrastructure and weather conditions.

The approved route also is in compliance with the “Safety Cover up Scheme” rules of dangerous goods transportation in Russia. Procedures are in place to re-evaluate the route, the operators report railway conditions after the delivery of each cargo, information is also collected on a “black box” recorder (speed limits, operator behaviour etc), this information is given to the shift manager for analysis. At each interim (control) station, the train, rolling stock and cargo are inspected to ensure integrity and safety of the cargo.

RZD conductors and two trained security guards who accompany the DGs throughout the journey. RZD have advised outside responders of their roles in cases of emergency. If an emergency situation arises it is the responsibility of the Russian Civil Defence (MCHS) to manage the situation, in addition RZD have a contract with ECOSPAS to provide services in case of emergency.

Transport Practice 1.2: *Ensure that personnel operating cyanide handling and transport equipment can perform their jobs with minimum risk to communities and the environment.*

The operation is in full compliance with
 in substantial compliance with Transport Practice 1.2
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

All RZD operators are trained in the handling of dangerous goods and specialized rolling stock and containers. The RFA and RZD have prepared a series of emergency response cards for DGs, cyanide is No. 619. The Card details all the responses necessary that RZD need to take in case of emergency. The Cards have been prepared using international best practices. Emergency Response (ER) cyanide training is aligned to Card 619.

SUMMARY AUDIT REPORT

Transport Practice 1.3: *Ensure that transport equipment is suitable for the cyanide shipment.*

The operation is in full compliance with
 in substantial compliance with Transport Practice 1.3
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

RZD use equipment in accordance with the “Rules for the Technical Operation of Russian Railways” (PTE). The rules detail the specifications required for rolling stock, locomotive, tracks and containers for such as stability, strength and condition for the loads that will be carried.

“Sanitary Rules for the Organisation of Cargo Transportation by Russian Railways” details the loading weights. The station has a designated platform and crane for off loading and up loading the cyanide. The crane has a documented maintenance record and operating certificate as does the crane operator.

Weights are checked before the rolling stock is loaded, consignment notes have a recorded weight of each container and the crane loading and unloading has indicator lights for the weights being lifted. Security seals are on each container these contain the unique number which is cross checked at each control station during the rail journey.

Transport Practice 1.4: *Develop and implement a safety program for transport of cyanide.*

The operation is in full compliance with
 in substantial compliance with Transport Practice 1.4
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

There are procedures in place to check the integrity of the shipping container before loading on to rolling stock at the port, each control station and final destination station. RR have a recording system (KEU-16VTS) where information and subsequent inspections are noted. TNT/ADR inspects the container again before road transport to Voro, and issues an acceptance certificate (signed and dated) to RR.

UN classification placards are placed on the 4 walls of the container and rooftop. Danger signage and labels on containers is compliant with GOST 14192-96 “Marking of Cargo” and GOST 19433-88 “Dangerous Goods Classification and Labelling”. These form part of the inspection undertaken by RR and TNT/ADR.

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Multilevel inspection control is maintained by RZD and all information with regard to the inspections recorded (KEU-16VTS). Inspections include, the container, rolling stock and locomotive, this is undertaken at the port loading to RR, each control station and final destination. All defects are recorded.

Repairs/rectifications are undertaken immediately. No locomotive or any rolling stock is allowed to leave if there are any defects. All workers receive a medical inspection at the beginning of each shift. Train drivers wear a bracelet which records such as blood pressure, pulse, falling asleep etc. Safety features in the train include an automatic stop if the train goes over a red light. Locomotives are automated. Train drivers do have limited working hours which equates to c150km of rail movement time. Train drivers are allocated a section of track to work for example 150km so the driver becomes very familiar with that particular section and weather conditions that may affect that section of track.

The rolling stock are fitted with a lock device to lock the container, as the containers are loaded the locks move to the closed position. RR has allocated staff that secure the cargos.

RZD have procedures in place if a train needs to be stopped for such as weather conditions, designated sidings would be used until the tracks are cleared. No containers are unloaded. RZD have teams that clear tracks on a regular basis due to heavy snow.

Before every shift RZD workers have a medical examination including blood pressure, drugs and alcohol testing. All information is recorded and approved before being allowed to work, additionally a train driver has to wear a medical monitoring bracelet, which also transmits the information. Medical records of RZD workers are kept by RZD on an approved system by RFA (Rostekhnadzor).

Transport Practice 1.5: Follow international standards for transportation of cyanide by sea and air.

The operation is in full compliance with
 in substantial compliance with Transport Practice 1.5
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

RZD do not use maritime transportation.

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Transport Practice 1.6: *Track cyanide shipments to prevent losses during transport.*

The operation is in full compliance with
 in substantial compliance with Transport Practice 1.6
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified: (Due to the sensitivity of security issues regarding storage of cyanide, no descriptions of substantial or non-compliance with this aspect of the Transport Practice should be provided.)

Locomotives are equipped with 2 radio communications systems should one fail. In addition the drivers have portable communications. Established procedures are in place in case of emergency. Communications blackout spots have been identified by RZD and procedures and systems are in place to accommodate these.

RZD use ETRAN system to track train movements, so locations of cargos are known especially dangerous goods at all times. TNT liaises with RZD on the progress of cargos and advises VORO accordingly.

When the train arrives at its final station the consignment notes are recorded (GU-42VTS) arrival book on the ETRAN system, this generates a delivery note and adds information to the consignment notes both hard copies and electronic versions are available. On arrival the containers are inspected by RZD and TNT before loading on to ADR vehicle. Consignment notes including the delivery and check off records are issued to go with the cargo.

2. INTERIM STORAGE: Design, construct and operate cyanide trans-shipping depots and interim storage sites to prevent releases and exposures.

Transport Practice 2.1: *Store cyanide in a manner that minimizes the potential for accidental releases.*

The operation is in full compliance with
 in substantial compliance with Transport Practice 2.1
 not in compliance with

*Summarize the basis for this Finding/Deficiencies Identified:**

TNT, RZD and ADR coincide with the delivery and uploading of cyanide, therefore no storage is required at RZD stations. The likelihood of accidental cyanide releases is minimal because cyanide is transported in sealed containers apropos UN design and specifications. RZD develops and implements safety procedures to prevent accidental cyanide releases and exposures.

SUMMARY AUDIT REPORT

3. EMERGENCY RESPONSE: *Protect communities and the environment through the development of emergency response strategies and capabilities*

Transport Practice 3.1: *Prepare detailed emergency response plans for potential cyanide releases.*

The operation is in full compliance with
 in substantial compliance with Transport Practice 2.2
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

RZD emergency response plan is “Card No. 619”. This card details all information in case of an emergency with cyanide. Additionally Russian Rail head office in Moscow have an agreement with ECOSPAS for providing an emergency response and rescue services. These are certified and licensed operators by RFA.

Card 619 cyanide (ERP) is appropriate for the selected transportation route and interim stations. The physical and chemical form of cyanide is considered in the ERP. Card 619 is prescribed for railways only. The card describes the RZD and outside responders' roles and responsibilities in order to protect the public and the environment.

Transport Practice 3.2: *Designate appropriate response personnel and commit necessary resources for emergency response.*

The operation is in full compliance with
 in substantial compliance with Transport Practice 2.3
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Emergency Response training is received by all relevant personnel at RZD, this includes such as drivers, conductors, station staff etc. in addition procedures and protocols have been prepared in accordance with Card 619. ER equipment is available on trains and also at stations. Should an emergency arise, the Russian Civil Defence would take control and manage a situation. Actions and duties of the railway workers in the event of an emergency are set out in RZD ERP and the international rules for the transportation of dangerous cargos. The ERP details such as safety measures, precautions to be observed, ER contact details, roles and responsibilities contact details.

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PPE response equipment for cyanide incidents are carried on the train and each station have provisions, this includes details of the use of PPE for example respirators. Special-purpose training is conducted as well as inductions for the receiving/offloading staff. Refresher training is undertaken once a week covering aspects pertaining to handling of dangerous goods. Emergency response equipment is inspected regularly and an inventory check list is available.

Transport Practice 3.3: *Develop procedures for internal and external emergency notification and reporting.*

The operation is in full compliance with
 in substantial compliance with Transport Practice 3.3
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

In case of emergency contact information is available in the ERP. Copies of the contact list are also provided to the conductors, security guards and train drivers. Each station will also have copies for cases of emergency. RFA CD manages all emergency situation. The information also contains contact details of such as TNT and VORO.

Emergencies and incidents are taken into account at each branch of the railway network, transport management and the Ministry of Railways of Russia. There is a reporting process is for incidents/accidents “Instructions for Technical investigation and recording of emergencies” whether or not it is an emergency.

RZD management submits monthly information on the state of safety, emergencies and incidents pertaining to dangerous goods to local authorities (Rostekhnadzor).

Transport Practice 3.4: *Develop procedures for remediation of releases that recognize the additional hazards of cyanide treatment chemicals.*

The operation is in full compliance with
 in substantial compliance with Transport Practice 3.5
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Procedures within Card 619 details remediation and/or neutralization of any spills that would affect the public and the environment. The instructions do not allow the release of any substances into water bodies, sewers or basements. The procedures include disposal methods of contaminated

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materials such as soils (Ministry of Natural Resources of Russia). 619 also includes the resumption of train movements following an accident/incident.

Any restoration work that may need to be undertaken is done by the Ministry of Railways of Russia (recovery trains) once the site has been made safe.

Transport Practice 3.5: Periodically evaluate response procedures and capabilities and revise them as needed.

The operation is in full compliance with
 in substantial compliance with Transport Practice 3.5
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Procedures are in place for reviewing the ERP by RZD for adequacy annually. Mock drills are undertaken throughout each year in accordance with the “Plan of the Principal Civil Defence Measures for Sverdlovsk Railway”. The plan is compiled annually, and contains a program of mock drill for large and small scale scenarios. The document is comprehensive and is updated annually and also following any incidents/accidents where changes need to be made. RZD provided examples of the type of mock drill scenarios previously undertaken. All drills have an investigative report afterwards, and where needed procedures are updated.

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APPENDIX A

St Petersburg Port Due Diligence Summary

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St. Petersburg Port Due Diligence Summary

The Auditor undertook a limited Due Diligence investigation of St Petersburg Port on behalf of the Polymetal Voro supply chain. Restrictions are in place for visits to the container terminals and especially the Dangerous Goods storage area. Having undertaken a desk review, discussions with Polymetal representatives and the Auditors knowledge of auditing Ports, the Auditor has no reason to suggest that St Petersburg Port would not be compliant with the ICMI Code requirements. Below is a brief outline of how compliance was demonstrated.



Location of St Petersburg Port on the Baltic Sea

Background

Polymetal purchases their cyanide from Tongsoh, Korea and uses Hyosung, Korea to manage the shipping and documentation logistics. St Petersburg port works under the auspices of the International Maritime Organization (IMO) is the United Nations specialized agency with responsibility for the safety and security of shipping and the prevention of marine and atmospheric pollution by ships. IMO's work supports the UN SDGs. The Russian Federation (RF) has been a member since 1958. St Petersburg port is the largest industrial marine port in Russia and holds an operating license for the importation of Dangerous Goods (DGs).

The cyanide is off loaded in St. Petersburg Port, by Stevedores and taken to the Dangerous Goods (DG) storage area within the port boundary to await customs clearance before being loaded on to Russian Rail (RZD) station on flat-bed rolling stock to Nizhny Tagil. The Stevedores are specialised in container-handling operations.

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Container Terminal, St. Petersburg Port

The Port of St. Petersburg's container facility covers an area of 89 hectares. The Port is equipped with eight 50-ton STS Panamax cranes, one 104-ton mobile crane, three 45-ton RMG cranes, 19 50-ton rubber-tyred gantry cranes, 37 straddle carriers, and a fleet of reachstackers, terminal tractors, and empty-handlers. The operation of the cranes and equipment is specialised and would require licenses from the Russian Federation Authorities. Having undertaken qualification checks at other ports and railway terminals using cranes, the Auditor has no doubt that the crane operators are qualified, experienced and trained accordingly.

St. Petersburg's container terminal provides a variety of services that include loading and unloading of all types of containers to and from ships and railway platforms, storing containers (including refrigerated containers), moving containers for both customs and veterinary inspections, and conducting pre-trip inspections and weighing containers. The weight of a cyanide container is provided on the consignment notes.

The Port has a storage capacity for ten thousand full and 4500 empty 20' containers (TEUs - Twenty-Foot Equivalent Unit). The port has 1757 meters in two rail tracks for container block trains and 422 meters (1384 feet) in one rail track with a covered platform for ten container rolling stock within the port area.

International Maritime Organisation (IMO) Member State Audit Scheme

The IMO Member State Audit Scheme is intended to provide an audited Member State with a comprehensive and objective assessment of how effectively it administers and implements those mandatory IMO instruments which are covered by the Scheme and also incorporates the following treaties and amendments:

- SOLAS, 1974, as amended (adding a new chapter XIII);
- the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, and the Seafarers' Training, Certification and Watchkeeping (STCW) Code;
- the Protocol of 1988 relating to the International Convention on Load Lines, 1966 (1988 Load Lines Protocol), as amended.

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The amendments make the auditing of Member States (RFA) (St Petersburg Port) mandatory, from 2016. The objects of the audit scheme are to ensure that the guidelines provided by the IMO including the IMDG are in place.

The scheme addresses issues such as conformance in enacting appropriate legislation for the IMO instruments to which a Member State is a Party; the implementation and enforcement of the applicable laws and regulations by the Member State; the delegation of authority to recognized organizations (ROs); the related control and monitoring mechanism of the survey and certification processes by the Member States.

Safety and Security

The Port takes seriously its responsibility to safety and security. The Port is securely fenced and has a restricted access. All employees and vehicles entering the port need to have a permit for entry and are security checked (searched) before being allowed entry. The IMDG chapter 1.4 discusses the preparation of a security plan and the elements required in that documentation. IMDG section 1.4.2.3 “security training” explains “*Security awareness training should address the nature of security risks, recognizing security risks, methods to address and reduce risks and actions to be taken in the event of a security breach. It should include awareness of security plans commensurate with the responsibilities of individuals and their part in implementing security plans*”. The Auditor has no reason to suspect that security plans, training and documentation are not in compliance with the IMDG requirements.

As a demonstration of Russia`s approach to its safety and security responsibilities the handling of DGs and bunkering at the Port of St Petersburg was suspended over a two month period around the FIFA World Cup in 2018. The instructions were issued by The Harbor Master of St Petersburg port. The security measures apply to all modes of transport associated with the port including railroad, and to stevedoring companies, cargo terminals and bunker suppliers. Similar restrictions were also applied during 2017 (football), that transport and handling of dangerous goods and vessels carrying dangerous goods, classified by the IMDG Code Classes 1-7, were not permitted to enter the port of St. Petersburg. The Auditor believes that this is an proactive action to their responsibilities for safety and security of DGs.

Emergency Response

As with all Emergency Response (ER) requirements in Russia any accidents/incidents are notifiable to the Russian Civil Defense (RCD) who take control and manage all situations. I have no doubt that St Petersburg port will have an Emergency Response Plan which details the protocols and procedures necessary to inform the RCD and what initial response actions should be taken. In my experience of Port auditing in Russia and other countries, there is a designated ER team on site 24/7 and an ER main stations where equipment is located and other storage facilities in the port area. Medical facilities are available at the port 24/7. The Auditor has no doubt that the plans, ER training, equipment and facilities are not in place.

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Environmental awareness and protection

In 2018 St Petersburg port increased its investment into its environmental sustainability's by 31%. It also experienced a 12% increase in cargo throughput in 2018 to 7,7 million tonnes, however the port authority was able to reduce its environmental footprint in all major parameters, for example:

- modernization of environmental protection facilities;
- modernizing the port water environmental facilities;
- enhance waste water disposal system;
- overhauled some sections of the sewer;
- reduce the volume of waste per a tonne of handled cargo reduced by 24%; and
- improving “control measures for air quality compliance”.

As a demonstration of environmental responsibilities: increased air quality samples are in the sanitary protection zone. The monitoring was conducted by a specialized company, the analysis results confirmed the samples complied to air quality standards.

The port set itself a goal on reducing waste and prepared a waste management action plan, which monitored the generation and disposal of waste for 12 months. Following the results from the monitoring, a waste reduction strategy (re-cycling and re-use) was implemented. Findings show that the volume of waste has reduced by 24% and the gross volume by 14.6%. The Stevedore company (St Petersburg) have implemented a set of measures (studies and monitoring) to reduce their impact on the ecosystem, atmosphere, water and land resources for compliance with the rules and requirements of environmental and sanitary legislation.

Other environmental protection measures have included:

- use of the latest scientific and technical developments in the field of waste disposal. As a result of actions taken over the last two years the volume of emissions per ton decreased by 18% and the volume of enterprise's waste water decreased by 34%. In general, the volumes of emissions from controlled sources do not exceed the statutory maximum permissible emission levels;
- protection of water resources, including regular monitoring of coastal zone use, cleaning and waste water quality monitoring, monitoring of water quality in the port water area, bacteriological tests of sea water;
- maintenance and repair works are carried out at wastewater treatment facilities, storm drains sewage pumping stations, the external storm sewer system is being thoroughly cleaned. For its wastewater treatment facilities KTSP uses the latest sorption filters;
- automatic weather station and tools for measuring the levels of priority pollutants, the environmental stations provide round the clock monitoring of air quality during production activities and provide an opportunity to respond quickly if the maximum permissible emission levels are exceeded or in the event of adverse weather conditions within the scope of the approved action plan to regulate emissions.

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Although the above environmental protections do not directly affect the cyanide cargos, they do demonstrate that St Petersburg port are responsible operators and have measure in place to undertake environmental monitoring, therefore the Auditor has no concerns that the port would not be acceptable under the cyanide code guidelines.

In March 2018, Marine Environmental Pollution committee (MEPC) adopted the [MEPC.1/Circ.834/Rev.1](#) *Revised Consolidated Guidance for port reception facility providers and users*, which consolidates in a single document the Guide to good practice for port reception facility providers and users (MEPC.1/Circ.671/Rev.1) and four other circulars related to port reception facilities (MEPC.1/Circ.469/Rev.2, MEPC.1/Circ.644/Rev.1, MEPC.1/Circ.645/Rev.1 and MEPC.1/Circ.470/Rev.1).

IMO has recognized that provision of reception facilities is crucial for effective MARPOL implementation, and the MEPC has strongly encouraged Member States, particularly those Parties to MARPOL as port States, to fulfil their treaty obligations on providing adequate reception facilities. The Baltic sea forms part of the MARPOL protection, therefore St Petersburg will be encouraged to implement their guidance.

**SUPPLY CHAIN AUDIT SUMMARY
POLYMETAL INTERNATIONAL PLC
VORO SUPPLY CHAIN – ADR EXPRESS**

MAY 2019



Prepared by

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SUMMARY AUDIT REPORT

Name of Operation: Polymetal Voro – Supply Chain
Name of Mine Owner: Polymetal International PLC
Name of Mine Operator: _____
Name of Responsible Manager: Daria Goncharova
Address: Polymetal, Prospect Narodnogo, Opolcheniya 2
State/Province: St Petersburg
Country: Russia Telephone: +7 812334 3666 Fax: +781 27536376
E-Mail: Goncharova@polymetal.ru

Summary

1.1 Background and Location

Voro is located in Russia's Sverdlovsk region, approximately 370 km north of the regional centre of Ekaterinburg (population of 1.5 million) and 25 km south of the city of Krasnoturinsk (population of 65,000). Voro is easily accessible from Ekaterinburg via the federal highway that runs 7 km from the site. The industrialised and moderately populated area around the deposit is home to several mining companies, ensuring good access to the grid and other infrastructure. In addition, there is good railway access with a Group-owned spur located 18 km from the site.



Figure 1:1 Sverdlovsk Region, Russia

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Figure 1:2 Supply Chain

Supply Chain Overview

Polymetal (St Petersburg Office) purchases the sodium cyanide for all its mining operations including Voro. Polymetal have signed a 5 year contract with Tongsoh Petrochemical Corp, South Korea (Tongsoh) and Hyosong Corporation, South Korea (Hyosong). Both Tongsoh and Hyosong are signatories of the Code and have full compliance status.

The cyanide for Voro mine enters Russian via the port of St Petersburg.

St Petersburg port is the largest industrial marine port in Russia and holds an operating license for the importation of Dangerous Goods (DGs). St Petersburg port works under the auspices of the International Maritime Organization (IMO) is the United Nations specialized agency with responsibility for the safety and security of shipping and the prevention of marine and atmospheric

SUMMARY AUDIT REPORT

pollution by ships. IMO's work supports the UN SDGs. The Russian Federation (RF) has been a member since 1958.

As with all seaports in Russia, including privately owned ones, the access to the DG storage areas are prohibited. The Auditor was not able to secure passes to enter the commercial side of the port, however research, discussions and understanding of how the port operates, the Auditor has no doubt that the port would be compliant with the Code requirements. The research undertaken by the Auditor is summarized in Appendix A of this report.

The cyanide is off loaded in St. Petersburg Port, by the Stevedores and taken to the Dangerous Goods (DG) storage area within the port boundary to await customs clearance before being loaded on to Russian Rail (RZD) station on flat-bed rolling stock to Nizhny Tagil.

TNT supervise the unloading with RZD staff and co-ordinate the uploading to ADR Express (ADR) vehicles, so that the cyanide is not stored at Nizhny Tagil station.

Polymetal employs TNT (office located in Nizhny Tagil) and ADR Express (office/depot located in Perm) to organize the transportation of cyanide to Voro. TNT prepare all the importation documentation and customs requirements. They also act as the liaison between RZD, ADR and Voro. TNT do not have any vehicles themselves. The Supply Chain audit included verification of St. Petersburg port for the handling (loading and unloading of cyanide from ship to rail cars (flat bed for containers). Rail transport to Nizhny Tagil, transfer to ADR vehicles for onward and final journey to Voro. See Figure 1:3 below.

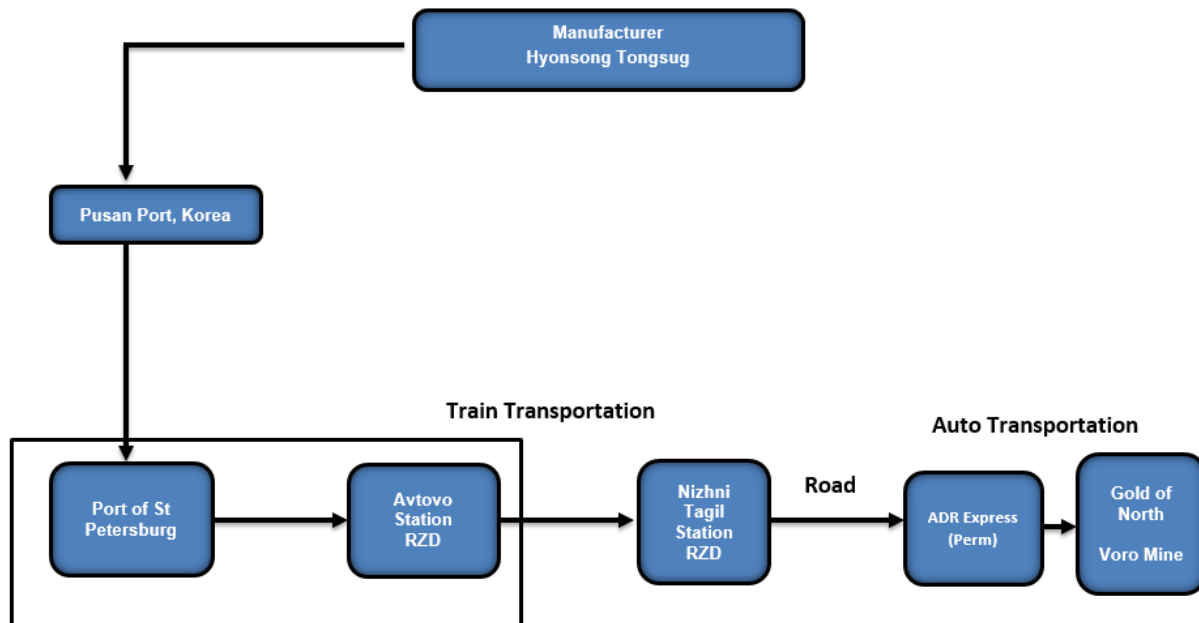


Figure 1:3 Supply Chain Flow Chart

SUMMARY AUDIT REPORT

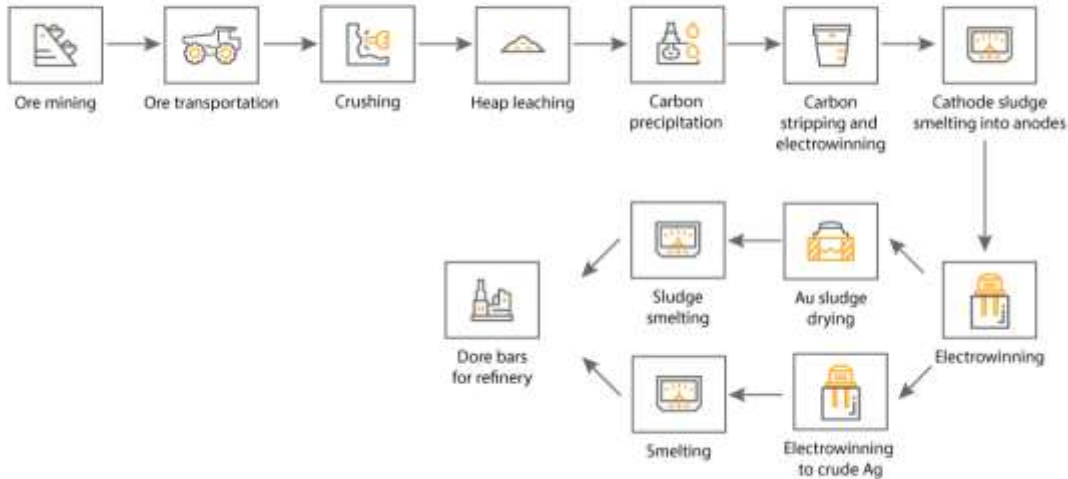
Operational Overview

Voro is one of Polymetal’s very first key gold assets acquired in 1998. Voro comprises an open-pit mine, a 950 Ktpa carbon-in-leach processing plant and a seasonal 1000 Ktpa heap leach circuit that accommodate the processing of both primary and oxidised ore.

The process plant is fully automated; Figures 1:4 below are the flow sheets for the primary ore and oxidised ores.

Voro Block Flow Diagram for oxidised ores

(Heap leaching)



Voro Block Flow Diagram for primary ores

(Carbon-in-Pulp Plant)

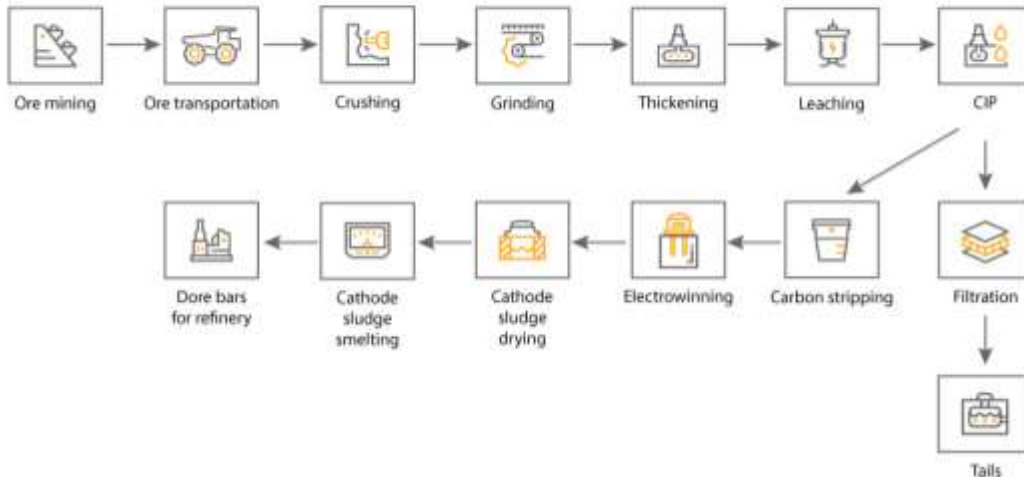


Figure 1:4 Schematic Process Flow Sheets for the Primary Ore and Oxidised Ores

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The process plant operates as per the illustrative flow sheet (Figure 1.4). Tailings produced from the gold recovery process are sent to the filtration system, where the filtrate is collected and re-circulated in the process (closed loop system). The filter cake dry tailings are deposited in the Tailings Storage Facility (TSF). The TSF is geosynthetically lined with a 1.5mm HDPE geomembrane. Surface water runoff from the tailings is captured and flows to the "surface water runoff pond", and flows to the water treatment plant before being discharged.

The oxidised ore uses a heap leach system, where by cyanide solution is drip fed onto the ore rock in order to liberate the gold into solution. This is collected via numerous collection pipes and drains into collection ponds from where it enters into the process plant for gold recovery. All residue solution is collected within the plant and re-used in the cyanide circuit (closed loop). The cyanide is received in St Petersburg port from South Korea. St Petersburg port holds a license for the importation of Dangerous Goods (DGs), which includes cyanide.

SUMMARY AUDIT REPORT

Auditor's Finding

This operation is

- in full compliance
- in substantial compliance *(see below)
- not in compliance

with the International Cyanide Management Code.

Audit Company: Wardell Armstrong International (WAI Ltd)

Audit Team Leader: Christine Blackmore

E-mail: cblackmore@wardell-armstrong.com

Names and Signatures of Other Auditors:

Date(s) of Audit: Site visit 17-24 November 2018

I attest that I meet the criteria for knowledge, experience and conflict of interest for Code Verification Audit Team Leader, established by the International Cyanide Management Institute and that all members of the audit team meet the applicable criteria established by the International Cyanide Management Institute for Code Verification Auditors.

I attest that this Summary Audit Report accurately describes the findings of the verification audit. I further attest that the verification audit was conducted in a professional manner in accordance with the International Cyanide Management Code Verification Protocol for Cyanide Transportation Operations and using standard and accepted practices for health, safety and environmental audits.

Voro Gold Mine Supply Chain –
ADR Express



May 2019

Voro Gold Mine Supply Chain –
ADR Express



May 2019

SUMMARY AUDIT REPORT

1. TRANSPORT: *Transport cyanide in a manner that minimizes the potential for accidents and releases.*

Transport Practice 1.1: *Select cyanide transport routes to minimize the potential for accidents and releases.*

The operation is in full compliance with
 in substantial compliance with Transport Practice 1.1
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

ADR Express (ADR) provisionally determine the route using the Russian Federation Authorities (RFA) route planner, the route planner takes into consideration, road categorisation, communities, rivers, bridges and terrain. It also takes into consideration climate variations. The route is then formally submitted to the RFA for approval. On approval the RFA issue a “ Special Permit for Transportation of Dangerous Good using and Approved Route”. The approval also contains the imposed conditions for example speed limits and procedures that must be observed during the transportation of cyanide. Deviations from this route are against the law. If road conditions prevent the use of the route such as landslides and flooding, an alternative route needs to be approved by the RFA before the vehicles progress.

ADR has documents the measures to be taken to address the risks identified on the route. The vehicles are all fitted with GPS tracker systems, Tachographs and the driver has a working and chargeable mobile phone. Contact with ADR office is every 2 hours.

The Russian Civil Defence (MCHS) is notified when cyanide is being transported. In cases of emergency it is the responsibility of the MCHS to attend and manage the situation. Should the need arise for communities to be informed of an emergency, this is also the responsibility of the MCHS.

Transport Practice 1.2: *Ensure that personnel operating cyanide handling and transport equipment can perform their jobs with minimum risk to communities and the environment.*

The operation is in full compliance with
 in substantial compliance with Transport Practice 1.2
 not in compliance with

SUMMARY AUDIT REPORT

Summarize the basis for this Finding/Deficiencies Identified:

All drivers involved with the transportation of cyanide have undertaken necessary training in accordance with ADR and have obtained ADR licenses to transport cyanide.

All ADR Drivers are DG trained and have a class E licence.

Transport Practice 1.3: *Ensure that transport equipment is suitable for the cyanide shipment.*

The operation is in full compliance with
 in substantial compliance with Transport Practice 1.3
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Only one 20ft container is loaded onto a trailer at a time, each container is sealed by the manufacturer and is compliant with UN specification and are only opened when they reach the Cyanide Storage area prior to the mixing process at VORO. Necessary procedures are in place to identify and mitigate risks pertaining to the transportation of cyanide by ADR-Express.

Transport Practice 1.4: *Develop and implement a safety program for transport of cyanide.*

The operation is in full compliance with
 in substantial compliance with Transport Practice 1.4
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The cyanide is transported in 20 UN approved shipping containers and are sealed when they leave the manufacturer, each container has a unique identity seal number which is recorded on the consignment notes and bills of lading.

UN designated signage are on each side of the container and placards "UN1689" classification 6 is displayed on the vehicle. The driver and designated mechanic inspect the vehicles before they leave the garage, this includes the placards. The vehicle is only released if it passes a control check, and is recorded in the Technical Control Inspection Logbook.

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All tractor and trailers are on a rolling maintenance programme. Tachographs and recording chips are fitted to each vehicle to monitor drivers hours, breaks and speed. The RFA have imposed regulations to drivers hours per week (40) and continuous driving hours so breaks need to be taken.

A medical check of each DG driver is undertaken prior to driving any DG, this includes testing for drugs and alcohol. A medical record is made and sent to ADR for inclusion in the consignment documentation. All medical records and consignment records are kept both electronically and hard copies.

Procedures are in place if road conditions prevent the use of the route such as landslides and flooding, an alternative route needs to be approved by the RFA before the vehicles progress.

Transport Practice 1.5: Follow international standards for transportation of cyanide by sea and air.

The operation is in full compliance with
 in substantial compliance with Transport Practice 1.5
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Cyanide transportation under the agreement between VORO and ADR-Express does not include transportation by sea or air, only vehicular transport from Nizhny Tagil Station to VORO Cyanide Storehouse.

Transport Practice 1.6: Track cyanide shipments to prevent losses during transport.

The operation is in full compliance with
 in substantial compliance with Transport Practice 1.6
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

All ADR vehicles are fitted with communication systems such as GLONAS (vehicle tracking), radio, emergency button in the truck cab and drivers have a cell phone. All communication systems are checked periodically, the GLONAS system reloaded by the supplier if there are any interruptions. Communications black out spots for cell phone have been identified, however using GLONAS the vehicle's location is known at all times.

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All documents are checked, by ADR office and the driver, before the vehicle is released. The document package includes the consignment notes, medical records, emergency response contacts, MSDS and other relevant information.

2. INTERIM STORAGE: Design, construct and operate cyanide trans-shipping depots and interim storage sites to prevent releases and exposures.

Transport Practice 2.1: Store cyanide in a manner that minimizes the potential for accidental releases.

The operation is in full compliance with
 in substantial compliance with Transport Practice 2.1
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

No Interim storage is used by either RZD or ADR. ADR collects the cyanide containers directly from the train railcars. There is a designated platform and crane for dangerous goods at the station, which the Auditor visited. TNT co-ordinate the arrival (train) and departure (road), so the cyanide is lifted directly from train to truck.

3. EMERGENCY RESPONSE: Protect communities and environment through the development of emergency response strategies and capabilities

Transport Practice 3.1: Prepare detailed emergency response plans for potential cyanide releases.

The operation is in full compliance with
 in substantial compliance with Transport Practice 3.1
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

ADR have prepared a comprehensive Emergency Response Plan (ERP) specifically for their vehicles and the cyanide route. The ERP contains the actions necessary in cases of emergency and identifies the roles and responsibilities of external and ADR/Voro responders including the driver, a list of contacts is provided in the ERP, this is also repeated on a quick reference card.

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A copy of the ERP is provided in the document package that travels with the cargo. The ERP discusses the solid form of cyanide and an MSDS is included in the package. The ERP also includes all aspects of the road conditions, weather and infrastructure. All drivers are acquainted with the ERP.

Transport Practice 3.2: *Designate appropriate response personnel and commit necessary resources for emergency response.*

The operation is in full compliance with
 in substantial compliance with Transport Practice 3.2
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Emergency response training is provided to all ADR dangerous goods drivers during their employment (every quarter) and in addition they receive ER training when applying for their dangerous goods license. By law refresher training needs to be undertaken as part of the retention of the license and ADR ensure this is undertaken. Training records are prepared for every employee.

Descriptions of the roles and responsibilities in cases of emergency are contained in the ERP and the H&S induction document. A list of emergency response equipment is included in the ERP, the ER equipment forms part of the checks before the vehicles are released.

Transport Practice 3.3: *Develop procedures for internal and external emergency notification and reporting.*

The operation is in full compliance with
 in substantial compliance with Transport Practice 3.3
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Sufficient information and evidence has been provided to the auditor to establish full compliance of ADR-Express with Transport Practice 3.3. The drivers demonstrate high level of knowledge pertaining to the emergency awareness and action required to respond in such. Russian Civil Defence is ultimately responsible for the emergency response and handling.

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Transport Practice 3.4: *Develop procedures for remediation of releases that recognize the additional hazards of cyanide treatment chemicals.*

The operation is in full compliance with
 in substantial compliance with Transport Practice 3.4
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Sufficient information and evidence has been provided to the auditor to establish full compliance of ADR-Express with Transport Practice 3.4. Remediation of potential releases and the additional hazards of cyanide treatment chemicals are recognized at ADR-Express. In case of an emergency, the Russian Civil Defence takes control and is responsible for the management of remediation and mitigation of spillages using designated chemicals and with careful consideration of any waterbodies along the transportation route.

Transport Practice 3.5: *Periodically evaluate response procedures and capabilities and revise them as needed.*

The operation is in full compliance with
 in substantial compliance with Transport Practice 3.5
 not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The ERP is revised following any RFA regulations, completion of any emergency response report, change of contact details and any changes to the emergency process.

ADR-Express periodically evaluates emergency response procedures and capabilities and revises them when required and in compliance with RFA regulations. The ERP is revised following any RFA regulations, completion of any emergency response report, change of contact details and any changes to the emergency process.

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APPENDIX A

St Petersburg Port Due Diligence Summary

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St. Petersburg Port Due Diligence Summary

The Auditor undertook a limited Due Diligence investigation of St Petersburg Port on behalf of the Polymetal Voro supply chain. Restrictions are in place for visits to the container terminals and especially the Dangerous Goods storage area. Having undertaken a desk review, discussions with Polymetal representatives and the Auditor's knowledge of auditing Ports, the Auditor has no reason to suggest that St Petersburg Port would not be compliant with the ICMI Code requirements. Below is a brief outline of how compliance was demonstrated.



Location of St Petersburg Port on the Baltic Sea

Background

Polymetal purchases their cyanide from Tongshuh, Korea and uses Hyosung, Korea to manage the shipping and documentation logistics. St Petersburg port works under the auspices of the International Maritime Organization (IMO) is the United Nations specialized agency with responsibility for the safety and security of shipping and the prevention of marine and atmospheric pollution by ships. IMO's work supports the UN SDGs. The Russian Federation (RF) has been a member since 1958. St Petersburg port is the largest industrial marine port in Russia and holds an operating license for the importation of Dangerous Goods (DGs).

The cyanide is off loaded in St. Petersburg Port, by Stevedores and taken to the Dangerous Goods (DG) storage area within the port boundary to await customs clearance before being loaded on to Russian Rail (RZD) station on flat-bed rolling stock to Nizhny Tagil. The Stevedores are specialised in container-handling operations.

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Container Terminal, St. Petersburg Port

The Port of St. Petersburg's container facility covers an area of 89 hectares. The Port is equipped with eight 50-ton STS Panamax cranes, one 104-ton mobile crane, three 45-ton RMG cranes, 19 50-ton rubber-tyred gantry cranes, 37 straddle carriers, and a fleet of reachstackers, terminal tractors, and empty-handlers. The operation of the cranes and equipment is specialised and would require licenses from the Russian Federation Authorities. Having undertaken qualification checks at other ports and railway terminals using cranes, the Auditor has no doubt that the crane operators are qualified, experienced and trained accordingly.

St. Petersburg's container terminal provides a variety of services that include loading and unloading of all types of containers to and from ships and railway platforms, storing containers (including refrigerated containers), moving containers for both customs and veterinary inspections, and conducting pre-trip inspections and weighing containers. The weight of a cyanide container is provided on the consignment notes.

The Port has a storage capacity for ten thousand full and 4500 empty 20` containers (TEUs - Twenty-Foot Equivalent Unit). The port has 1757 meters in two rail tracks for container block trains and 422 meters (1384 feet) in one rail track with a covered platform for ten container rolling stock within the port area.

International Maritime Organisation (IMO) Member State Audit Scheme

The IMO Member State Audit Scheme is intended to provide an audited Member State with a comprehensive and objective assessment of how effectively it administers and implements those mandatory IMO instruments which are covered by the Scheme and also incorporates the following treaties and amendments:

- SOLAS, 1974, as amended (adding a new chapter XIII);
- the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, and the Seafarers' Training, Certification and Watchkeeping (STCW) Code;

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- the Protocol of 1988 relating to the International Convention on Load Lines, 1966 (1988 Load Lines Protocol), as amended.

The amendments make the auditing of Member States (RFA) (St Petersburg Port) mandatory, from 2016. The objects of the audit scheme are to ensure that the guidelines provided by the IMO including the IMDG are in place.

The scheme addresses issues such as conformance in enacting appropriate legislation for the IMO instruments to which a Member State is a Party; the implementation and enforcement of the applicable laws and regulations by the Member State; the delegation of authority to recognized organizations (ROs); the related control and monitoring mechanism of the survey and certification processes by the Member States.

Safety and Security

The Port takes seriously its responsibility to safety and security. The Port is securely fenced and has a restricted access. All employees and vehicles entering the port need to have a permit for entry and are security checked (searched) before being allowed entry. The IMDG chapter 1.4 discusses the preparation of a security plan and the elements required in that documentation. IMDG section 1.4.2.3 “security training” explains “*Security awareness training should address the nature of security risks, recognizing security risks, methods to address and reduce risks and actions to be taken in the event of a security breach. It should include awareness of security plans commensurate with the responsibilities of individuals and their part in implementing security plans*”. The Auditor has no reason to suspect that security plans, training and documentation are not in compliance with the IMDG requirements.

As a demonstration of Russia’s approach to its safety and security responsibilities the handling of DGs and bunkering at the Port of St Petersburg was suspended over a two month period around the FIFA World Cup in 2018. The instructions were issued by The Harbor Master of St Petersburg port. The security measures apply to all modes of transport associated with the port including railroad, and to stevedoring companies, cargo terminals and bunker suppliers. Similar restrictions were also applied during 2017 (football), that transport and handling of dangerous goods and vessels carrying dangerous goods, classified by the IMDG Code Classes 1-7, were not permitted to enter the port of St. Petersburg. The Auditor believes that this is an proactive action to their responsibilities for safety and security of DGs.

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Emergency Response

As with all Emergency Response (ER) requirements in Russia any accidents/incidents are notifiable to the Russian Civil Defense (RCD) who take control and manage all situations. I have no doubt that St Petersburg port will have an Emergency Response Plan which details the protocols and procedures necessary to inform the RCD and what initial response actions should be taken. In my experience of Port auditing in Russia and other countries, there is a designated ER team on site 24/7 and an ER main stations where equipment is located and other storage facilities in the port area. Medical facilities are available at the port 24/7. The Auditor has no doubt that the plans, ER training, equipment and facilities are not in place.

Environmental awareness and protection

In 2018 St Petersburg port increased its investment into its environmental sustainability's by 31%. It also experienced a 12% increase in cargo throughput in 2018 to 7,7 million tonnes, however the port authority was able to reduce its environmental footprint in all major parameters, for example:

- modernization of environmental protection facilities;
- modernizing the port water environmental facilities;
- enhance waste water disposal system;
- overhauled some sections of the sewer;
- reduce the volume of waste per a tonne of handled cargo reduced by 24%; and
- improving "control measures for air quality compliance".

As a demonstration of environmental responsibilities: increased air quality samples are in the sanitary protection zone. The monitoring was conducted by a specialized company, the analysis results confirmed the samples complied to air quality standards.

The port set itself a goal on reducing waste and prepared a waste management action plan, which monitored the generation and disposal of waste for 12 months. Following the results from the monitoring, a waste reduction strategy (re-cycling and re-use) was implemented. Findings show that the volume of waste has reduced by 24% and the gross volume by 14.6%. The Stevedore company (St Petersburg) have implemented a set of measures (studies and monitoring) to reduce their impact on the ecosystem, atmosphere, water and land resources for compliance with the rules and requirements of environmental and sanitary legislation.

Other environmental protection measures have included:

- use of the latest scientific and technical developments in the field of waste disposal. As a result of actions taken over the last two years the volume of emissions per ton decreased by 18% and the volume of enterprise's waste water decreased by 34%. In general, the volumes of emissions from controlled sources do not exceed the statutory maximum permissible emission levels;

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- protection of water resources, including regular monitoring of coastal zone use, cleaning and waste water quality monitoring, monitoring of water quality in the port water area, bacteriological tests of sea water;
- maintenance and repair works are carried out at wastewater treatment facilities, storm drains sewage pumping stations, the external storm sewer system is being thoroughly cleaned. For its wastewater treatment facilities KTSP uses the latest sorption filters;
- automatic weather station and tools for measuring the levels of priority pollutants, the environmental stations provide round the clock monitoring of air quality during production activities and provide an opportunity to respond quickly if the maximum permissible emission levels are exceeded or in the event of adverse weather conditions within the scope of the approved action plan to regulate emissions.

Although the above environmental protections do not directly affect the cyanide cargos, they do demonstrate that St Petersburg port are responsible operators and have measure in place to undertake environmental monitoring, therefore the Auditor has no concerns that the port would not be acceptable under the cyanide code guidelines.

In March 2018, Marine Environmental Pollution committee (MEPC) adopted the [MEPC.1/Circ.834/Rev.1](#) *Revised Consolidated Guidance for port reception facility providers and users*, which consolidates in a single document the Guide to good practice for port reception facility providers and users (MEPC.1/Circ.671/Rev.1) and four other circulars related to port reception facilities (MEPC.1/Circ.469/Rev.2, MEPC.1/Circ.644/Rev.1, MEPC.1/Circ.645/Rev.1 and MEPC.1/Circ.470/Rev.1).

IMO has recognized that provision of reception facilities is crucial for effective MARPOL implementation, and the MEPC has strongly encouraged Member States, particularly those Parties to MARPOL as port States, to fulfil their treaty obligations on providing adequate reception facilities. The Baltic sea forms part of the MARPOL protection, therefore St Petersburg will be encouraged to implement their guidance.