INTERNATIONAL CYANIDE MANAGEMENT CODE

SUMMARY AUDIT REPORT

Orica Mining Chemicals

Box to Sparge Tank Transfer Facility
Ventanilla, Peru

2020

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1.0 INFORMATION ON THE AUDITED OPERATION

Name of Cyanide Production Facility: Orica Mining Chemicals Bag to Bulk Transfer Facility, Ventanilla, Peru

Name of Facility Owner: Orica Australia Pty Ltd.

Name of Facility Operator: Orica Australia Pty Ltd.

Name of Responsible Manager: Frank Valverde - Manufacturing Plant Lead Sparge

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2.0 LOCATION DETAIL AND DESCRIPTION OF OPERATION:

Orica is a global leader in the manufacture and distribution of sodium cyanide to the mining industry. It´s manufacturing facility in Yarwun, Queensland, supplies sodium cyanide to key mining regions in Latin America, Africa and Oceania.

Orica Mining Services Peru S.A. operates a Box to Sparge Transfer Facility (transfer plant) within the APM Terminals Inland Services S.A. (APM) containers warehouse located at Ventanilla Callao, Perú. This is a new sparge plant built in 2019 with state-of-the-art technology. Orica's box to sparge tank facility was pre-operationally audited on October 29, 2019 and began operations on December 23, 2019.

Orica´s transfer plant is located in an area of 2,126 m2 within the property of APM. The closest homes to the plant are located 600 m away with the urbanization Las Brisas. Closest surface water bodies to the property are the Pacific Ocean 1,500 m to the west and the Chillón River 2,000 m north of the site.

The transfer plant was constructed to supply mine site customers in Peru with cyanide transported within sparge isotanks. The transfer facility comprises a purpose-built structure that houses material handling equipment and there are associated facilities (a partly open warehouse protecting sea containers containing boxed cyanide, change rooms, equipment storage, office, ablutions, guard house and yard area).

After the import process to the Callao Port, sea containers are transported by land by to APMs warehouse, a certified in the Cyanide Code. Containers will be moved to the transfer plant according to need and / or request of the plant. The scope of this certification audit is the cyanide transfer operations within the limits of the plant. Cyanide transport operations outside the plant limits (sea containers arrival and isotanks departure transport operations are not in the scope of this audit.

On the arrival of the vehicle transporting the container up to the transfer plant, the container will be removed from the vehicle by a reach stacker of 40 tons capacity. From this location the sodium cyanide will be distributed by Orica in isotanks to their using sparge technology.

The facility transfers solid sodium cyanide from Intermediate Bulk Containers (IBC) to sparge tank (isotanks). Cyanide briquettes in IBC are packed in double bags, one of polyethylene and the other of polypropylene of 1,135 kilograms that are contained in wooden box which arrive to Callao port in 20' sea containers with 20 boxes each

The transfer plant allows the transfer of sodium cyanide to 98% (+/-1%), from IBC type containers of 1 to 1.1 tons of capacity, to isotanks - sparge containers of 28 m3 capacity.

Currently the plant is only working day shifts, 5 days a week, and 50 weeks a year; which equates to a maximum of 20,000 tonnes of annual production, filling an average of four isotanks per day.

IBC are detachable wooden boxes, containing a polyethylene bag with handles to attach to the electric elevator. Inside this bag is a polypropylene bag in direct contact with sodium cyanide briquettes.

Isotanks are cylindrical metal containers, which are mounted on a platform to fit a truck for transport to the mine. Isotanks have valves, through which hoses are connected that allow water to enter to dissolve concentrated sodium cyanide and in this way, facilitate the safe discharge into the cyanide reception tanks in the mine.

The transfer plant has the following components among others, to allow cyanide transference from IBC to isotanks:

- Structural rails and electric lift: to lift and move to the shipping hopper the woven polypropylene bags that come inside the IBCs.
- Shipping hopper: in an enclosed space consisting of doors with automatic closing system designed to receive and discharge sodium cyanide from polypropylene bags to isotanks. The shipping hopper has negative internal pressure, generated by a fan, which will control the emissions of cyanide particles into the environment.
- Filter system: aims to control the particles emission into the air. It is composed of a separator cyclone, a 2 micron diameter filter and an escape duct into the atmosphere.
- Hydraulic system for container tilt: metal structure designed to receive and secure 28 m3 isotanks, so that they can be placed upright (90° angle), optimal for product shipping operation. Isotanks in this position are attached to the shipping hopper with a hose.
- Maneuvering platform is a metal structure with stairs and railings, suitable to support the weight of equipment and allow the safe work of the personnel of the sodium cyanide shipping plant.

- Weight scale.

All the activities necessary for the operation of the plant are currently carried out by ORICA's own staff.

The isotank is placed and secured in the hydraulic system by means of a Taylor type charger.

An operator activates the hydraulic system to tilt the isotank up to 90°, placing it upright. At the same time, the operator-activated maneuvering platform and shipping hopper slide to the isotank and become tightly closed.

An IBC box is placed by means of a forklift. An operator opens the IBC box and connects the electric elevator to the handles of the polyethylene bag. The structural rail system is activated and the bag is raised and moved to the shipping hopper, which has the doors open.

The bag enters the shipping hopper and the doors close. The filter system is immediately activated. The bag falls on a wedge and opens starting the transfer of the briquettes from the bag to the isotank. This process takes 30 seconds and is the time of maximum sodium cyanide (NaCN) emission that becomes hydrogen cyanide gas (HCN) at the output of the filter system.

Once the bag is completely empty, the shipping hopper doors open and the bag is directed through the railing system to the box to deposit the empty bag. After filling, closing and removing the isotank from the hydraulic system, the empty bags are manually compacted.

This procedure is repeated until the isotank is filled – with 20 IBC's. The full shipping cycle of a bag takes 6 minutes. Filling an isotank takes 2 hours. In an 8-hour shift, the filling of 4 isotanks is completed.

Once the isotank is full, the maneuvering platform slides to the starting position, the isotank is tightly closed and lowered with the hydraulic system to the upright position. The full isotank is ready to be transported.

Throughout the shipping process, properly trained operators take all safety and control measures and verify that the procedure is performed step by step. The automatic and mechanical control system has safety switches that allow the next step to be performed.

3.0 AUDITOR'S FINDING

The operation is

☑ in full compliance
☐ in substantial compliance
☐ not in compliance

with the International Cyanide Management Code.

Audit Company:	Bruno Pizzorni www.bpizzorni.com
Lead / Technical Auditor:	Bruno Pizzorni E-mail: bpizzorni73@gmail.com
Date(s) of Audit	October 26, 27, 2020

I attest that I meet the criteria for knowledge, experience and conflict of interest for Code Certification 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 Certification Auditors.

I attest that the Audit Report accurately describes the findings of the certification audit. I further attest that the certification audit was conducted in a professional manner in accordance with the International Cyanide Management Code (ICMI) Cyanide Production Verification Protocol and using standard and accepted practices for health, safety and environmental audits.

Box to Sparge Tank Transfer Facility Peru		October 27, 2020
Name of the facility	Sign of Lead Auditor	Date

4.0 PRODUCTION VERIFICATION PROTOCOL AUDIT FINDINGS

Principle 1 – Operations:

Design, construct and operate cyanide production facilities to prevent release of cyanide

Production Practice 1.1: Design and construct cyanide production facilities consistent with sound, accepted engineering practices and quality control/quality assurance procedures.

The operation is in

- ☑ in full compliance with Production Practice 1.1
- ☐ in substantial compliance
- ☐ not in compliance

Summarize the basis for this Finding/Deficiencies Identified:

The facility maintains the quality control and quality assurance (QA/QC) construction records of the transfer plant. QA/QC programs have been implemented during the construction of the Orica´s sparge plant in 2019. The quality assurance plan was carried out by the company *River Com Peru S.A*. and includes the procedures, methods, records and practices to ensure that the project execution will be carried out under control and in accordance with the standards and quality requirements applicable to the project. The plan includes procedures and inspection plans and instructions for the execution of the quality assurance plan, supplemented with quality records to leave objective evidence of compliance with said control.

Appropriately qualified personnel reviewed facility construction and provided documentation that the facility has been built as proposed and approved. The auditor reviewed QA/QC documents plans for inspections and tests, as-built plans, raw material control - quality certificates, quality control reports, welding discipline, non-destructive testing, touch up, construction procedures, packing lists. Also reviewed quality control records for manufacturing as: material verification, dimensional control records, weld control and welder qualification records.

The materials used for construction of the plant are compatible for the transfer process of solid sodium cyanide pellets from IBC boxes to sparge tanks. Stainless steel is used for process equipment that meets cyanides during box to bulk transfer operations. The isotank into which cyanides will be transferred are constructed in carbon steel.

The area around where cyanide is being transferred is sealed with concrete and asphalt that is in good condition. The cyanide solution pump and associated hoses and pipework are fabricated from a range of materials including poly vinyl chloride, mild steel and rubber.

Automatic systems, visual controls and safety features are installed to prevent releases due to power outages or equipment failures. Key features are:

- A platform for removing the isotank access hatch whilst the vessel is at around 15° to the horizontal. This enables a visual inspection of the isotank for available capacity before the transfer commences.
- The transfer hopper is aligned directly to the isotank during transfer. This provides good visibility of any issues that may develop during filling. Because the hopper is large enough to hold an entire bag of cyanides the operator can readily see if the hopper has enough capacity to hold a bag of cyanides before introducing it to the hopper. There is also a programmable logic controller (PLC), which helps control lateral movement of bags of product and vertical movement of the hoppers.
- The hydraulic systems that control the movement of the tilt frame and the transfer hopper and the powered system that controls the bag hoist are configured so that on power failure they simply “stay put” which is a failsafe mode for the transfer facility.
- In case of power outages, the electrical board have a button for emergency stops. The transfer board enables the generator set and vice versa, disconnects it as soon as the power returns. In case of failure of both systems, the operators would return the boxes with cyanide to their original position and close the isotank. If it is in an inclined position, it can be plugged manually. The operation manipulates a bag of cyanide at a time. Air filters will block quickly due to lack of air due to power outages.
- As improvement in the system, Orica conducted a Hazard Study with stages 1, 2 and 3 to evaluate the safety system of the tilt frame for the isotank. This study included the participation of Orica personnel such as local and regional managers, operators and the plant manager. Improvements to the system, among others, are:
    - Installed eight surveillance cameras controlled from the plant manager's office. One is in front of the isotank hutch to see how it is sealed and allows to check the state of the O-ring, the nuts and ensure that the protocol established in the safe work procedure is followed; other cameras are, among others, for the stacker operation, hoist and cyanide discharge zone.
    - Optical sensors around the perimeter of the tilt frame pit, allowing to detect any presence of people by interfering with the beam of light. The system will trigger an alarm stopping the entire operation as it was detected an infraction of the environment of the tilt frame.

- Red and green lights as traffic light system so that the reach stacker operator can know if the isotank fixing elements are connected to the tilt platform. The fasteners can only be operated from the control panel located on the first level.
- They installed an orange light to indicate that there is a moving load in the hoist.
- Four push buttons to trigger the fire alarm, that would stop the entire operation.
- One fixed HCN gas detector with 3 sensors installed at critical areas.

The building area where cyanide is transferred has a geomembrane layer under the concrete surface to provide a surface that minimize seepage to the subsurface. The transfer operation area and the reach stacker ramp is managed on a concrete surface that can minimize seepage to the subsurface. Asphalt surfaces protect the ground throughout in the warehouse areas where boxes of cyanide and boxes of used packaging materials will be handled.

To prevent overfilling of the isotanks during the transfer process, the access hatch to the isotank is opened after the vessel had been placed on the tilt frame and it had been elevated around 15° to the horizontal. At this point, the operator inspects the interior of the isotank to verify that liquids or solids remaining are less than approximately 100 - 200 liters in volume. This step is prompted by the Box to Sparge Checklist, and the volume identified is required to be reported to the Supervisor.

Operators may readily see whether the transfer hopper has enough capacity to hold a bag of cyanides before introducing it to the hopper for discharge. The isotank capacity is 28 m3 and maximum quantity of sodium cyanide transferred is around 22.7 m3.

The isotank loading bay is a secondary containment protected with a geomembrane layer under the concrete surface that provides a competent barrier to any leakage. It is sealed with concrete and curbs to increase its effectiveness in containing any cyanides spilled during filling. The auditor considers that the release of the entire isotanks inventory of cyanides is not a credible failure scenario and that the loading bay is therefore very conservatively sized with the capacity to hold a volume significantly more than that of one isotank. The spillage of one 1,100 kg bag of cyanides, due to the overfilling of a hopper by one bag is the only credible scenario. Although the building housing the transfer facility is completely indoors, storm capacity is not a significant consideration as there is little rainfall in Lima.

The only solution pipeline is the one from conducting any water contaminated with cyanide drained into a containment pit, from the facility cleaning activities or remaining from the isotank. A suction pump is used to remove the liquid from the pit to a storage tank. The contents of the storage tank are pumped into an isotank (maximum 100 liters per isotank) while the isotank is filled with solid cyanide. All the area of the transfer facility building acts as a secondary containment provided with concrete floor built over a geomembrane layer which provides a competent barrier to leakage.

Production Practice 1.2: Develop and implement plans and procedures to operate cyanide production facilities in a manner that prevents accidental releases.

The operation is

☑ in full compliance with Production Practice 1.2

☐ in substantial compliance with

☐ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The facility has the Standard Operational Procedure (SOP) MAN-PTV-004 Isotank Transfer Operation describing the operational necessary for its safe and environmentally sound operation. Activities are described step by step from the arrival of the sea container with IBC´s to the area, until the end of the operation with the isotank filled with cyanide and removed from the facility area to APM´s yard for subsequent shipment to the mine. In regular operation the procedures performed are:

- Pre-fill inspection
- Preparation for transfer operations
- Transfer Operation - Transfer of bulk cyanide bags
- Isotank hatch closure
- Maintenance
- Periodic inspections

The procedure address such matters as process description, the use of personal protective equipment (PPE) and other preparations by the operating team and detailed instruction for the transfer operation, including cautions and notes regarding hazardous aspects. The activities included in this SOP have been subjected separately, to a formal risk analysis called Job Safety and Environmental Risks Analysis (JSERA).

Procedures for contingencies during upsets in its job activities that may result in cyanide exposures or releases are addressed in the Plant Operational Contingency Plan for Sodium Cyanide Shipping and also in the JSERA´s. In these last, activities are divided into work stages to assess the risks and potential effects of the stage, including upset conditions. Control measures are applied and additional controls if required, are assessed.

The auditor reviewed JSERA´s for activities such as forklift operation; opening and closing of lid in hatch, cleaning and washing isotanks; transfer boxes of sodium cyanide to the lifting area; transfer operations of sodium cyanide, among others, finding they include controls for contingencies during upset conditions.

The transfer facility has a corporative management of changes procedure to identify when site operating practices have or will be changed from those on which the initial

design and operating practices. Orica Mining Chemicals, including the transfer facility, has adopted the Orica Model Procedure for Modifications. The management of change procedure requires review by environmental and safety personnel of any process change or modification, prior to sign-off and implementation of proposed changes and modifications

The operation manages this corporate database accessed through its intranet that allows to register and control any changes to operating practices regarding the original design. It is a system to which all employees have access and different areas (those required depending on the case) approve the change after evaluating them through a series of questions that include health, safety and environmental considerations. The auditor reviewed several records of management of change procedures conducted.

The transference plant has developed and implemented the SUPCH-RTV-015 2020 Sparge Plant Equipment Annual Maintenance Plan. As the plant is in a two year guarantee after construction, Rivercom Peru SAC – the contractor that oversaw the construction and assembly of machinery and electrical installations, is in charge to execute the maintenance program. Activities are documented for equipment and devices necessary for cyanide production and handling. In addition, the Plant Supervisor complements with monthly inspections to all items included in the Maintenance Program.

By other side, the facility has redundant systems for example for the hoist, the compressors and for the hydraulic unit that elevates the isotank to its filling position. The auditor reviewed maintenance records and monthly inspections performed to the plant critical components, according to scheduled.

HCN gas levels are monitored both with fixed and portable gas detectors. The plant has one fixed HCN monitor – MSA TRIGARD® Gas Monitoring System - with 3 sensors distributed strategically through the areas where HCN gas is more probably to occur: on the isotank hatch opening platform, in the area of placement of handles for lifting the bags with NaCN and the third sensor at the area of the hopper for cyanide discharge. Plant operators wear portable HCN gas monitors. The low-level alarm activated at 4.7 ppm of HCN gas, personnel should retreat about 10 meters, returning to the job site when HCN levels are below 4.7. When the high-level alarm set at 10 ppm is activated, all personnel must evacuate the area. All monitors are planned to be calibrated periodically, according to the manufacturer's specifications.

In addition to gas monitors, the operation also controls the correct tightening of the hatch bolts on the isotanks by means of 2 torque meters.

The auditor reviewed the Calibration Program for 2020. HCN gas monitors are calibrated every 6 months to 4.7 and 10 ppm by the monitors provider.

The nature of the operation is such that other process instrumentation does not play a critical role in managing the risk of potential exposures and releases and so not calibrated according to manufacturer’s recommendations. Other key process parameters to monitor are the total number of crates to be loaded into the isotank and

verification that the isotank is relatively empty of solid or liquid material before loading an isotank check list.

The transfer facility procedures and infrastructure prevents any discharge to the environment of any cyanide solution or cyanide-contaminated water that is collected in a secondary containment area. All the floor under the concrete slab at the cyanide transfer building has an HDPE geomembrane layer to provide a competent barrier to any leakage.

Any water from cleaning activities is collected to a polyethylene tank of 1,100 l. Once the tank is filled at 500 l capacity, water is pumped with a submergible pump to the isotank and goes to the mine process. All water collected in the transfer facility secondary containment will be pumped into the tank where it will be temporarily stored prior to being pumped into the sparge isotank as part of the sparge isotank filling process. The hopper will be wiped down rather than washed at the end of each transfer limiting the production of wastewater.

Although the area where the plant is installed is very arid and with minimal annual rainfall, the rainwater collection system from the roof is collected in polyethylene tanks.

The SOP Isotank Transfer Operation describes in section 5.3 Transfer Operations, the environmentally sound procedures for disposal of cyanide or cyanide-contaminated solids. The procedure details that cyanide packing and all hazardous solid wastes including the used bags, personal protection equipment (PPE) and other contaminated waste arising from housekeeping (cleaning cloths and sweepings) are to be placed in used cyanide boxes (sealed when full) pending disposal by the licensed contractor Green Care, an authorized contractor for the management of hazardous waste according the Peruvian relevant legislation for hazardous solid waste, including the transport of solid hazardous waste from industrial premises and the treatment of hazardous solid waste.

Cyanide stocks maintained at the facility are minimum. Major storage of sodium cyanide is conducted at other area, out of the limits of the transfer plant, but in the same site managed by APM Terminals, an ICMI certified warehouse. On demand, APM warehouse sends by mean of a reach stacker the sea containers with sodium cyanide to the transfer plant for daily operations. Sea containers are a placed in an open area very well ventilated.

The transfer facility includes a roof covered yard where they place the cyanide boxes for the transfer operation. This is an open space with good ventilation, where public access is prohibited. To avoid or minimize the potential for exposure of cyanide to moisture, the boxes to transfer to isotanks and empty boxes are kept under this roofed area.

The opening of sea containers is subject to a procedure requiring ventilation and atmospheric testing prior to entry by means of an HCN gas detector.

Sea containers by their design minimize the potential for exposure of cyanide to moisture. It is noted that cyanide is stored in double layers of plastic lining within

wooden boxes within shipping containers. It must be noted that annual rainfall is less than 1 cm.

Cyanide is stored in a secure area where public access is prohibited. The transfer facility is a secured compound within the APM´s site at Ventanilla. Security is 24 hours 7 days per week and there is a dedicated security patrol for the cyanide compound within the overall facility.

The facility performs a pre-fill check list to isotanks where correct signage check fields are included, to ensure that the cyanide supplied by Orica in Peru is packaged as required by the political jurisdictions through which loads will pass.

Placards and painted signage is used to identify the shipment being dispatched from the transfer facility as cyanide, as required by national and international regulations or standards, which include UN Numbers and Dangerous Goods Class labels, both of which are prescribed in the United Nations Model Regulations and the IMDG Code. Before filling isotanks at Ventanilla, the isotanks area checked to ensure that all signage is in place.

Production Practice 1.3: Inspect cyanide production facilities to ensure their integrity and prevent accidental releases.

The operation is

☑ in full compliance with Production Practice 1.3

☐ in substantial compliance with

☐ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Equipment inspections area routinely performed as stated in the SOP Isotank Transfer Operation, to ensure that the equipment remains in good operating conditions. In each transfer of cyanide, isotank elements are inspected: O-ring, hatch studs (bolts) and isotank valves. Equipment such as transfer hopper, air filters, hoist, emergency showers, compressor and sump pump, PPE should be inspected weekly. Every fortnight they inspect the cone valve.

In addition, the Plant Supervisor conducts monthly inspections of all elements for structural integrity and signs of corrosion and leakage tanks, valves, pipelines and secondary containments. Also, pre-use inspections are performed as for isotanks pre-fill inspections, use of the forklift, guardrails and emergency showers, among other.

The major plant items that require inspection are those used in the handling of solid sodium cyanide from boxes through the transfer system to the isotanks. The inspection of these facilities for their integrity and signs of leaks include:

- Inspection of isotanks at the arrival to the transfer plant: valves, seals, bolts and dented surfaces. Isotanks integrity is checked every 2 years by a third party.
- The hoist system to lift bags from boxes and transfer them into the transfer hopper. Inspections address hoist components including the chain, hook and bag lifter for their correct placement, signs of wear or other damage.
- The transfer hopper used to direct the flow of solids from bags into isotanks. Specific items subject to inspection include the doors that control admission of bags to the hopper, the bag splitter, the cone valve that controls the release of solid cyanide to the isotank, the seal arrangement where the hopper connects temporarily to isotanks and the air filter system that controls dust generated and during the transfer operation. Specific inspection points are raised as appropriate to the known vulnerabilities and of each component.
- The sump pump system including secondary containment, hoses, fittings, pipelines and residue tank. Specific inspection items cover integrity and evidence of leaks.

Isotanks inspection frequency is done every transfer operation. For other key equipment such as transfer hopper, air filters, hoist, emergency showers, compressor and sump pump and PPE, inspection are done weekly. Monthly inspections are done to all elements for structural integrity and signs of corrosion and leakage tanks, valves, pipelines and secondary containments other important elements. In addition the plant operators perform prework inspections, which in opinion of the auditor is enough to assure that equipment is functioning within design parameters.

Inspection are documented though performed inspection checklist records. The auditor reviewed the inspection registers Pre-Filling Inspection, Discharge Hopper Maintenance, Transfer Process Checklist, and Use and Proper Cleaning of PPEs and Emergency Showers, documented since the plant began operations on December 2019 to the date of the audit. Inspections reviewed include the date of the inspection, the name of the inspector, and any observed deficiency.

The documentation reviewed identify the specific items observed. The checklists incorporate a table detailing identified corrective actions, the status of the corrective actions and the review of the status of the corrective actions raised by previous inspections.

Principle 2 – Worker Safety:

Protect workers' health and safety from exposure to cyanide

Production Practice 2.1: Develop and implement procedures to protect plant personnel from exposure to cyanide.

The operation is

☑ in full compliance with Production Practice 2.1

☐ in substantial compliance with

☐ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

To minimize worker exposure during this normal plant operations, the facility has performed Standard Operations procedures (SOPs) and the Job Safety and Environmental Risk Analysis (JSERA) for each activity involved in these SOPs.

The SOP MAN-PTV-004 Isotank Transfer Operation describes the plant operations step by step from the arrival of the sea container with IBC´s to the area, until the end of the operation with the isotank filled with cyanide, which is the finished product.

JSERA´s divide the activity into stages, evaluates potential risks and effects by mean of probability and consequences, establish control measures (existing / proposed / critical) and evaluates any risk level additional control required. The operation has developed and implemented procedures to minimize worker exposure during emergency, abnormal and not-routine plant operations The auditor reviewed several JSERAs both for normal and abnormal plant operations.

For the plant maintenance, the facility has developed and implemented the 2020 Sparge Plant Equipment Annual Maintenance Plan which covers all the elements needing periodic maintenance. Procedures for maintenance activities are described in two principal documents developed by River Com detailing with pictures the elements and mechanisms involved, the objective, the work description and maintenance staff involved:

- Preventive Maintenance - Lubrication of Pivoting and Axial Mechanical Components Sparge Orica Plant; and
- Verification Plan Maintenance of Hoist

Orica Mining Chemicals, including the transfer facility, has adopted the Orica Model Procedure for Modifications for management of changes to review proposed process and operational changes and modifications for their potential impacts on worker health and safety. This online procedure incorporates fields for analysis of the necessary worker protection measures. It is a system to which all employees have access and

different areas (those required depending on the case) approve the change after evaluating them through a series of questions that include health, safety and environmental considerations. The auditor reviewed several management of change records since the plant enter into operations on December 2019, as detailed in section Production Practice 1.2 of this report.

Orica´s mode of operation for the transfer facility includes soliciting workers input in developing and evaluating health and safety procedures, activities risk analysis (JSERA) and also por change of management procedures. As an example, all five operators of the transfer plant participated on developing the JSERA for solid NaCN transfer operations and for the change management procedure from September 7, 2020 to ask the cyanide producer to change the bags packing system as due to humidity it was found the product to stick to bags.

There is an established dialogue between the Cyanide Operations Team Lead, the Plant Supervisor and workers in the existing operation. At the beginning of each working day, the workers and the supervisor hold daily 5-minute safety meetings, where, among other issues, workers can give their feedback on the safe work procedures. Workers also have these opportunities during frequent face-to-face training talks with the supervisor.

The transfer facility use both fixed and portable gas monitoring devices to confirm that controls are adequate to limit workers exposure to HCN gas. The plant has one fixed HCN monitor – MSA TRIGARD® Gas Monitoring System - with 3 sensors installed strategically through the areas where HCN gas is more probably to occur: on the isotank hatch opening platform, in the area of placement of handles for lifting the bags with NaCN and the third sensor at the area of the hopper for cyanide discharge. Plant operators wear portable HCN gas monitors.

The HCN monitoring equipment is maintained, tested and calibrated in a manner consistent with the directions of the manufacturer. The auditor reviewed the Calibration Program for 2020 and calibration records. HCN gas monitors are calibrated every 6 months to 4.7 and 10 ppm by the monitors provider.

The transfer facility has identified areas and activities where workers may be exposed to HCN gas and sodium cyanide dust and requires the use of personal protective equipment as necessary in these areas when these activities are being performed.

At these locations, exposure to harmful concentrations of cyanide is possible depending on the operations being conducted. The tasks that may result in harmful exposures include:

- forklift operations during the transfer of cyanide boxes from the shipping container in which they are delivered into one of the four dedicated shipping containers in which they are stored pending transfer operations into isotanks;
- transfer operations from the storage containers to the lifting position;
- isotank hatch opening and closing;
- opening boxes at the lifting position;
- splitting and discharging bags through the transfer hopper;

- waste bag storage and handling operations.

The operation has demarcated an area including the transfer facility and part of the yard area in which boxes containing cyanide are handled. The defined PPE requirements applicable for the 1st level operator, forklift operator and for the isotank hatch opening and closing operator are:

- Full face mask with gas and dust filters
- Safety boots
- PVC or heavy latex gloves
- Disposable Tyvek suits
- HCN gas monitor

The transfer platform operator in addition to the PPE above, must wear a helmet with continuous airline or full face mask with suitable cartridges for particles and gas.

As stated in the SOP Isotank Transfer Operation, a minimum of 3 operators is required to perform this activity. The arrangement consists of one pair of employees on the lower level to open the isotank hatch and preparing bags for transfer and one operator on the upper level controlling the transfer. In addition one supervisor at the facility administrative office is controlling the operation by a television closed circuit (CCTV). There is also a security guard who is responsible for ensuring that unauthorized personnel do not gain access to the facility during a transfer. The operation has determined that the handling of waste bags and the dismantling of boxes are low risk activities and so do not require a buddy system to operate.

These work provisions ensure that a buddy system is used, or workers can otherwise notify or communicate with other personnel for assistance, help or aid where deemed necessary. Also, as stated by the Plant Supervisor, the CCTV is a useful tool to assess and rescue any improper behavior of operators during the transfer process, as cameras are installed strategically allowing views of the transfer deck, tilt frame, transfer deck structure including hopper, isotank inspection station, electrical room compressors and box disassembly area.

Orica does assess the health of employees to determine their fitness to perform their specified tasks prior to commencing employment. The health assessment process of the transfer facility workers is tracked in a matrix that indicates the date and provides evidence that the medical exams rea performed as required by local regulations: before beginning to work with the company and then annually. Workers at the plant are the same ones who worked in the previous Orica´s transference plant. Records include evidence of medical exams performed during the workers period with Orica. Tests taken also assessed the physical suitability of employees to undertake their respective tasks at the transfer facility.

At the time of the audit, a contractor was at the plant doing air quality monitoring for occupational health on behalf of the plant. On the other hand, Orica's medical area has implemented a software where each worker fills out a survey twice a week, reporting

on some activity that has caused them discomfort. This reached the medical area with a score report.

In recent times, according to the Orica Plant Supervisor, the company is making a campaign to combat fatigue and drowsiness. Each worker can enter data from their cell phone.

Plant operators rotate positions weekly, alternating forklift work, placing bag handles, and working up on the platform, promoting continuous improvement.

The transfer facility has a place to change clothes. The SOP Isotank Transfer Operation procedure clearly states that required personal protective equipment must be fitted before entry to the relevant work areas. It also requires once the operators have completely completed the operation in the corresponding shift, all disposable suits are considered contaminated and should be removed to be placed in the container at the waste storage area. This procedure also applies to contractors and visitors.

Warning signs advising workers that cyanide is present and that, if necessary, suitable PPE must be worn, are located around the site. At locations where exposure to harmful concentrations of cyanide are possible, the operation has demarcated the area with a line. PPE requirements to enter areas within the line are clearly identified through use of signage and are also identified and implemented according stated in the Standard Operating Procedures, training, etc.

In occasion of the audit it was noted that warning signs advising that cyanide is present, were missing at both entrances to the transfer plant. This was resolved during the audit. Cyanide presence signs were placed at the entrances and added to the welcome sign, which was sodium cyanide shipping plant

Personnel are prohibited from smoking, eating and drinking, and having open flames in some areas where there is the potential for cyanide contamination. Signs are displayed at the entrances to the transfer facility building that prohibit open flames, eating and drinking.

Observations made during the audit were consistent with these prohibitions being observed. Both the Visitor Induction and training materials set out clearly that smoking, eating and drinking are prohibited in the facility.

Production Practice 2.2: Develop and implement plans and procedures for rapid and effective response to cyanide exposure.

The operation is

☑ in full compliance with Production Practice 2.2

☐ in substantial compliance with

☐ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The facility has developed and implemented the Operational Contingency Plan dated September 2020. This is a specific written emergency response plan and procedures to respond to cyanide emergencies and exposures. Also has the Procedure to Treat Cyanide Poisoning addressing specific actions for treatment with oxygen and cyanide antidote. therapy.

Two showers, low-pressure eye wash stations and several non-acidic fire extinguishers are located strategically at the transfer facility. One station is located outside the transfer area on the ground level of the transfer facility. The eyewash and shower stations are supplied by a designated water supply tank with 1,000 liters capacity each.

Dry powder fire extinguishers were observed throughout the transfer facility. No carbon dioxide fire extinguishers were observed. The operation inspects monthly its fire extinguishers and send them for maintenance on an annually basis.

Showers, low-pressure eye wash stations and non-acidic fire extinguishers are maintained and inspected and tested on a regular basis.

The transfer facility has two large size “G” non portable oxygen bottles and 3 carrier bags with portable oxygen bottles, located at the Plant Manager office. There is also an Ambu, oxygen masks and fittings, and four antidote kits maintained refrigerated according to at the manufacturer´s temperature specifications.

Size “G” cylinder medical oxygen cylinders with medical valve mouthpiece have an “on demand” valve mouthpiece replacing the need for separate resuscitators. Antidote kits contain sodium nitrite, sodium thiosulfate and amyl nitrite antidotes.

Water for the showers and low pressure eye stations is available, this is checked before beginning any transfer operation. Communications means are also available as all operators have mobile phones, also they can communicate verbal on any emergency due to the compact size of the plant. Mobile phone system enables emergency assistance to be summoned via the APM’s facilities.

The Plant Supervisor performs weekly and fortnight inspections to the facility first aid equipment to assure that it is available when needed. The inspection checklists requires to test water pressure, blockages and leaks for the eye washes and showers. This is also included in the pre-work inspection for isotank transfer operation.

Weekly inspections to oxygen equipment include:

- Oxygen cylinders pressure, valve piece and signs of damage to the flow meter.
- Mouthpiece cleanliness, signs of perishing and whether it is connected to the oxygen tube.
- Oxygen delivery cleanliness, signs of perishing and whether it is connected to the mask and oxygen bottle.

The operation stores the cyanide antidotes as directed by their manufacturer and replaces the antidotes on a schedule that ensures they will be effective when used. The antidote kit contents, and first aid equipment are inspected using check sheets. A section in the checklists is also provided to note comments and corrective actions. A review of the checklists confirmed that this is done in accordance with the procedure.

Sodium Cyanide Material Safety Data Sheets (MSDS) and first aid instructions copies of the Procedure to Treat Cyanide Poisoning are available at different areas of the transfer facility, both where cyanide is handled and at the administrative office and published in a dashboard in the Plant Manager office , addressing specific actions for treatment with oxygen and cyanide antidote. All informational materials are in Spanish, the language of the workforce (Spanish) and are available to workers in the transfer facility.

All elements, containers, boxes and equipment containing cyanide, including the cleaning water recovery system piping and tank, are identified to alert workers of their contents. Direction of cyanide flow in pipes is signaled.

Shipping containers packed with cyanide boxes (IBCs) and sparge isotanks delivered for transfer operations are clearly labelled as to their contents through emergency information panels. The container used to store waste bags and liners and used personal protective equipment (within used IBCs) is also clearly identified.

All visitors and transfer facility workers receive induction detailing information about risks at the plant and safety information including cyanide hazards and decontamination procedure.

For the transfer facility workers, there is a place to change clothes. The SOP Isotank Transfer Operation procedure clearly states that required personal protective equipment must be fitted before entry to the relevant work areas. It also requires once the operators have completely completed the operation in the corresponding shift, all disposable suits are considered contaminated and should be removed to be placed in the container at the waste storage area.

The transfer facility has its on-site capability to provide first aid assistance to workers exposed to cyanide as all its personnel is trained in first aids, has oxygen antidotes and mean of communications. This capability is reinforced by the locator APM´s who has a medical clinic , with permanent doctor and an ambulance. Orica has an agreement with APM´s for medical assistance of its personnel in case of any emergency.

The transfer has a procedure developed and tailored for the actual operation, to transport exposed workers to locally available qualified, off-site medical facilities. In the event of any cyanide exposure the Emergency Response Plan (ERP) will be initiated requiring the first person on the scene to notify the Plant Supervisor, APM´s doctor and appropriate emergency aid entities, (hospitals, Callao fire department, Civil Defense) for response. In the event of cyanide exposure an ambulance will be dispatched.

Contact numbers are visibly located on the transfer facility, in the ERP and in the List of Key Contact Personnel Procedure.

Box to Sparge Tank Transfer Facility Peru		October 27, 2020
Name of the facility	Sign of Lead Auditor	Date

All cases of worker exposure to cyanide are required to be transferred to hospital for observation and medical treatment.

The transfer facility has alerted the local hospital of Ventanilla regarding the potential need to treat patients for cyanide exposure. The notification was a through a letter which included the Contingency Plan, the NaCN MSDS and a quick guide to response against cyanide intoxications. The operation is confident that the local hospital has adequate, qualified staff, equipment and expertise to respond to cyanide exposures.

The transfer facility has a developed a yearly emergency mock drill schedule where every two months different emergency scenarios are tested to test response procedures: tsunami/earth wake, fire, sodium cyanide spill and exposure.

The auditor reviewed the mock emergency drill reports between the period from January to September 2020. In all cases lessons learned from the drills are analyzed and if necessary, incorporated into response planning.

The transference plant has adopted the application software Enablon Go in use as a corporative system in Orica, to report incidents, investigate and evaluate incidents, including cyanide exposures, to determine if the facility's programs and procedures to protect worker health and safety and to respond to cyanide exposures are adequate or need to be revised.

Orica requires all incidents to be reported to Orica's Off-Site Facilities Manager for investigation and corrective action using the Orica incident reporting and investigation procedure.

The auditor reviewed the incidents report application which allows to assign corrective actions, responsible and due dates. The system allows users to report incidents from the cellphone.

Principle 3 – Monitoring:

Conduct environmental monitoring to confirm that planned or unplanned releases of cyanide do not result in adverse impacts.

Production Practice 3.1: Conduct environmental monitoring to confirm that planned or unplanned releases of cyanide do not result in adverse impacts.

The operation is

☑ in full compliance with Production Practice 3.1

☐ in substantial compliance with

☐ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The transfer facility is located along the Callao coastal strip approximately 1.5 km from the Pacific Ocean. The transfer facility does not have a direct discharge to the ocean or other surface water. The transfer of solid cyanide from box IBCs to sparge isotanks is a dry process and does not directly generate waste process solution.

Waste liquid is generated indirectly via condensation of atmospheric moisture and by draining residual liquor contained in isotanks returned from mine sites.

During early morning transfer operation, atmospheric humidity condenses on the cool isotanks that have been stored within the open yard overnight. When these isotanks are positioned vertically as part of the filling operation, the condensation runs off the isotank into a sump located within the transfer pit. An automatic pump is located within the sump that transfers liquid within the sump to a 1000-liter tank.

Empty isotanks returned from mine sites often contain residual amounts of cyanide liquor. If excess amounts of liquor within the returned isotanks are detected at the transfer facility, the transfer facility uses a pump to transfer this liquid into the tank used to store liquid from the sump (1,000-liter tank). Liquid from the 1,000-liter tank is pumped into the isotank being filled after the solid cyanide transfer operation has been completed. The isotank containing cyanide and the waste liquid is then transported to the mine site.

Negligible storm water is generated from the transfer facility and it is not discharged off-site. The average annual rainfall for Ventanilla, which is a district within the province of Callao, is approximately 1.8 mm. Early morning condensation draining from the transfer facility roof reports to downpipes that drain directly onto the bitumen surface immediately outside the transfer facility building. This water evaporates during the day. The site has a continuous cover of bitumen and cement.

The Plant Supervisor advised that the transfer facility does not have an indirect discharge to surface water. Seepage is unlikely to be generated from the transfer facility for the following reasons:

- The transfer of solid cyanide from box IBCs to sparge isotanks is a dry process and does not directly generate waste process solutions. The indirect generation of liquids are of a minor volume.
- The site has a continuous cover of low permeability bitumen in general areas and concrete over a geomembrane liner in the transfer areas – all in good condition.
- The transfer facility is sheltered from the elements and the site experiences an extremely low rainfall in any case.

Groundwater at the site is 5 m below ground level as stated in the Environmental Impact Assessment (EIA) performed by ERM consultants.

The Transfer Facility limits atmospheric process emissions of HCN gas, such that the health of workers and the community are protected.

The following activities have been identified on the site where atmospheric process emissions of HCN have the potential to affect the health of workers:

- Transferring IBCs from warehouse containers to Transfer Facility.
- Box (IBC) to isotank cyanide transfer.
- Waste bag and liner management (packing in boxes and placement in container).

The main controls for minimizing emissions of hydrogen cyanide during the Transfer Facility operations are:

- The transfer facility is designed around solid cyanide only.
- A maximum of four IBCs are positioned at any one time in the facility awaiting immediate transfer to isotanks, limiting the volume of material directly in-process that is capable of generating HCN gas.
- The cyanide hopper has an extraction fan and filter to remove dust before being released to the atmosphere.
- The cyanide transfer operational areas are clearly demarcated. Entry to these areas requires specific PPE to protect persons accessing the area. During transfer operations, the worker within the vicinity of the hopper is connected to a designated air supplies.

The Environmental Impact Assessment (EIA) refers to the American National Institute of Safety and Health (NIOSH) for worker exposure limits.

Exposure limits are for HCN are 10 ppm instantaneously and 4.7 ppm continuously over eight hours. All employees working in areas with the potential for HCN generation are required to wear HCN monitors that are set to alarm at 4.7 ppm. Employees are required to leave the immediate area if the alarm sounds.

Orica engages a consultant to undertake quarterly air quality monitoring at four locations surrounding the Transfer Facility. Two are located within the Orica site and two are external to the Orica site, but within the APM Terminals Inland Services containers warehouse.

The transfer facility is required by the Municipality of Callao to obtain an Environmental Assessment Certificate. The Environmental Assessment Certificate is an authorization that certifies the existence of an operation, possible negative impacts that could be generated by the proposed project, and the structured plan to prevent, mitigate, or compensate for the potential environmental impacts that may occur. Orica has been issued with an Environmental Assessment Certificate for operating the transfer facility. The certificate obliges Orica to conduct health, safety and environmental monitoring. The environmental monitoring component is linked to the monitoring commitments made in the EIA and does not reference groundwater monitoring requirements or groundwater compliance points.

The environmental monitoring component is linked to the monitoring commitments made in the EIA and does not reference groundwater monitoring requirements or groundwater compliance points.

The transfer facility does not have a direct or indirect discharge to surface water and groundwater and, as such does not monitor for cyanide in water.

Orica engaged a consultant to undertake biannual ambient air quality and noise monitoring at four locations surrounding the transfer facility. Monitoring activities are documented, results are compiled and reported to the Municipal Government. In opinion of the auditor, the operation conducts monitoring at frequencies adequate to identify changes in a timely manner. Frequencies are adequate to characterize the medium being monitored. Surface and groundwater is not required to be monitored.

Principle 4 – Training:

Train workers and emergency response personnel to manage cyanide in a safe and environmentally protective manner

Production Practice 4.1: Train employees to operate the plant in a manner that minimizes the potential for cyanide exposures and releases.

The operation is

☑ in full compliance with Production *Practice* 4.1

☐ in substantial compliance with

☐ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The transfer facility has implemented an Annual Training Program which is being developed providing training and coaching to its employees according to the program, including cyanide hazards and refresher training conducted annually.

Instruction material deals with risks of cyanide, poisoning symptoms, alert and first aids, medical treatment, investigation of facility failures, cyanide emergencies and cyanide recognition. The procedures to follow in the event of exposure are set out.

The auditor reviewed several training records covering the period before the plant´s operation since December 2019, to the audit date.

All workers at the transfer facility have been trained in the use of PPE specifying when and where this equipment is required. Training materials introduce to the PPEs required at the transfer facility under all circumstances and locations including Tyvek suits, safety boots, safety helmet, HCN monitor, full face shield, safety glasses, latex gloves, dust and gas masks. Also they have been trained in the use of the helmet incorporating air hood with positive air flow from a separate air compressor to work in the second floor at the hooper platform.

Practical training in the correct use of PPEs is covered by Plant Supervisor as part of pre-transfer meetings. The Supervisor monitors the operators for the correct use and condition of PPE before cyanide transfer operation. The auditor reviewed the training records.

All operators of the transference plant had been trained on site to perform their normal production tasks to minimize the risks to workers health and safety and to prevent cyanide releases. Prior on beginning operations, all personnel has to complete this training.

At Orica, the operators are trained on the transfer facility as soon as they are integrated to the operation. In the normal course of events, the Plant Supervisor provides the

"classroom" training and then follows up with on-plant training in the operating procedures. The Supervisor gives trainees the job procedures to read through and reviews their progress and understanding with them. When the trainee is confident of the learning, the Supervisor carries out an oral test in the procedures. This is undertaken whilst walking around the plant, so the trainee can demonstrate a practical understanding.

The training elements necessary for each job are identified in the training materials. As all operators at the plant rotate work every week, they are all required to be trained for jobs on:

- Cyanide Awareness Training.
- SOP Isotank Transfer Operation.
- Facility Induction.
- Forklift Accreditation.
- Emergency Response Training
- First aids
- Work at heights.
- Confined spaces

A training matrix details the training elements to cover, the level of training, the date of the training, the people trained, and the supporting evidence of the training performed. Maintenance of the plant.

Training is provided by the Plant Supervisor, a very experienced operator with around 12 years working operating Orica´s cyanide transference facilities. The Plant Supervisor gives training to the transfer facility operators. He has extensive experience Orica´s transference plant and in gold mining operations. There is a sound base of technical expertise in the team of people involved in providing training, both in general and to the cyanide operations. Recognized Peruvian training and services companies specialized in firefighting and safety consulting, also provides training services to the workers.

Employees are trained prior to being allowed to work with cyanide, according to local regulations and Orica standards. The operator is not able to work the task to be conducted until he is previously trained.

Workers receive theoretical training in classroom, then practical training at the transfer facility about the tasks related to cyanide operations: cyanide boxes, cyanide transfer from boxes to sparge tanks, manipulation of dangerous chemical products and MSDS between others.

They are provided with four days of training and assessment under the direction of the Plant Supervisor before starting to work.

The transfer facility evaluates the effectiveness of cyanide training by testing and job observation. Evaluation quizzes are used to evaluate the effectiveness of Cyanide Awareness Training. The results of the quizzes are filed in connection with the training conducted rather than in individual staff files. Minimum score is required to pass the

course. Verbal questioning and on the job observation by the Facility Supervisor are the means of assessment for work procedures.

Production Practice 4.2: Train employees to respond to cyanide exposures and releases.

The operation is

☑ in full compliance with Production Practice 4.2

☐ in substantial compliance with

☐ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

Orica trains the transfer facility workers in the procedures to be followed if a cyanide release is discovered. The Contingency Plan notes all cyanide transfer facility personnel are to be trained how to recognize an emergency, notify the emergency response team and practice in implementing the Plan. Also specifies that emergency response personnel must be trained to cope with emergencies.

To assist in the implementation and tracking of the Contingency Plan training requirements, the facility has a training matrix for the Plan. The matrix details the training elements covered, the level of training, the date of the training, the people trained, and the supporting evidence of the training performed.

Orica train its workers to respond to exposure to cyanide and bi-monthly drills are performed to test and improve their response skills. The current Contingency Plan requires simulation drills in the implementation of the Plan to be carried out to test the procedures, equipment, and resources described in the Plan, and to train personnel in emergency responses.

Emergency drills are being evaluated from a training aspect. The current Contingency Plan requires drills to be conducted periodically covering low level emergencies, medium scale and full emergency response drills. The purpose of the simulation drills is to test the procedures, equipment, and resources described in the Plan and to determine if personnel have the knowledge and skills required for effective response. The operation has revised its training procedures based on deficiencies identified during mock emergency drills.

Training records are retained throughout an individual's employment documenting the training they have received, including the names of the employee and the trainer, the date of training, the topics covered.

The records are maintained in an Excel spreadsheet-style database. The training database identifies all training elements relevant to the facility and for each that has

been delivered there is a record of: name of employee trained, title of course, topics covered, dates of training events and the trainer name.

Training files retained for Orica-specific training include original assessment records for individual participants, demonstrating how their knowledge was assessed and details of their assessments. Copies of certificates issued to employees are also retained in the record keeping system.

Principle 5 – Emergency Response:

Protect communities and the environment through the development of emergency response strategies and capabilities.

Production Practice 5.1: Prepare detailed emergency response plans for potential cyanide releases.

The operation is

☑ in full compliance with Production Practice 5.1

☐ in substantial compliance with

☐ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The transfer facility has developed the document Operational Contingency Plan v10 (Contingency Plan) dated September 2020. The scope of the Contingency Plan covers emergencies with potential damage to people, the environment or material goods, which may be generated during the operation of the sodium cyanide transfer plant from IBC-type boxes to ORICA's sparge containers.

The Contingency Plan describes the response actions to be taken for the types of potential release scenarios identified by Orica which include dropping an IBC during a transfer operation resulting in a spillage of solid cyanide. A risk assessment by Orica determined that the zone of influence of such a scenario was limited to the transfer facility building.

The assessment also identified fires, explosions, power outages as events that would not result in a spillage of more than 1.1 tons of solid cyanide. The transfer facility does not have ponds or waste treatment facilities.

The Contingency Plan contains enough emergency procedural information and details the persons responsibilities during an emergency. The Plan also outlines response guidelines for the following identified scenarios.

- Intoxication by HCN or cyanide.
- Fire, including minor and major fires.
- Cyanide spill, including minor and major spills.
- Natural disasters, including earthquakes and sea quakes.

The Plan details the response actions required for individual persons involved in the management of the emergency: evacuating personnel from the transference plant and APM´s personnel as well as potentially affected communities from the area of exposure.

It also states the use of cyanide antidotes and first aid measures for cyanide exposure. The Contingency Plan and Orica placards located at the Managers Office describe

cyanide first aid measures for persons intoxicated by HCN or cyanide. The Contingency Plan notes the antidotes should only be used by physicians or paramedics. An external training provider has provided First Aid training to the workforce. The training included the administration of amyl nitrite and oxygen.

The Plan considers minor and major cyanide spills and the emergency response procedures detail the procedure to limit the spread of releases and control the releases at their source. The transfer facility uses a batch process and consequently any release is limited to a maximum of 1.1 tons of solid cyanide which is expected to be readily contained within the confines of the transfer facility.

The Contingency Plan describes detailed procedures necessary for containment, assessment, mitigation and future prevention of releases.

Production Practice 5.2: Involve site personnel and stakeholders in the planning process.

The operation is

☑ in full compliance with Production Practice 5.2

☐ in substantial compliance with

☐ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The transfer facility operators is involved in the Contingency Plan development and review, as after the bi-monthly emergency mock drill it is evaluated to confirm its functionality. The Plan has been also shared and coordinated with the site locator APM Terminal and had coordination meetings where the agenda to be addressed was to review the operational risks, the contingency plan, emergency organization, equipment maintenance, communications, plant access and security.

APM, the Fire Department of Callao, the Police and the Ventanilla Hospital have been provided with the Contingency Plan, the NaCN MSDS and a Guide for quick first aids in case of cyanide exposure, along with a letter explaining Orica´s cyanide transfer plant activities in the area. Orica is engaged with these stakeholders to maintain their involvement in ongoing improvement of the Plan. Apart from APM Terminal, the neighboring communities do not have a designated role within the emergency response procedures.

Community or neighboring business has been identified as likely to be affected, based on a review of potential releases from the transfer facility and the distances involved. The transfer facility is in the APM container warehouse which is, in turn, located within an industrial area. The closest residential community is approximately 500 m from the

APM gate. The involvement of APM is identified as part of the emergency management rather than as an affected community.

The worst-case scenario at the transfer facility would involve dropping an IBC during a transfer operation resulting in a maximum spillage of 1.1 tons of solid cyanide. It was determined that the zone of influence of such a case was limited to the transfer facility building. The immediate response and cleanup as described in the Contingency Plan limits the generation of HCN and the zone of influence.

The transfer facility has communicated the local response agencies in the emergency planning and response process. The Contingency Plan clearly describes the role of outside responders. APM, the Fire Department of Callao, the Police and the Ventanilla Hospital have been provided with the Contingency Plan, the NaCN MSDS and a Guide for quick first aids in case of cyanide exposure, along with a letter explaining Orica´s cyanide transfer plant activities in the area.

The transference plant, APM´s warehouse and Orica corporate´s personnel continuously communicates to assure the Plan address current conditions and risks. Orica is engaged to maintain their involvement in ongoing improvement of the Plan. Apart from APM, the neighboring communities do not have a designated role within the emergency response procedures.

Production Practice 5.3: Designate appropriate personnel and commit necessary equipment and resources for emergency response.

The operation is

☑ in full compliance with Production Practice 5.3

☐ in substantial compliance with

☐ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

According to the emergency level, the Plan designates primary and alternate emergency response coordinators with explicit authority to commit resources in order to implement it. According to the Contingency Plan, the Head of Operations will approve any expenditures required to address on any emergency level. Emergencies are classified in terms of their severity and the corresponding control and mitigation methods. The Emergency Coordinator is responsible for controlling and mitigating the emergency event and this person can be one of two people depending on the emergency classification level.

The emergency response team is identified in the Contingency Plan. There is a list of the emergency response team. Response will be as follows:

- First person on the scene (First Responder)
- Emergency Coordinator
- Incident Command System

The Contingency Plan identifies the transfer facility Plant Supervisor as the head of the Incident Command System. The Incident Command System is based on five functions providing support in the areas of Command, Operations, Planning, Logistics and Administration and Finance.

The Contingency Plan requires appropriate training for emergency responders. Training requirements have been developed for the transfer facility identifying necessary training for specific positions, scheduling the identified training and tracking the implementation of the training. The Plan notes all cyanide transfer facility personnel are to be trained on how to recognize an emergency, notify the emergency response team and practice in implementing the Contingency Plan.

Among the training required for emergency response personnel is OSHA Level I – "First Responder Awareness level", Level II – "First Responder Operations" and Level III – "Hazardous Materials Technicians." Applicable to the workers and transfer facility Supervisor and designated personnel of APM*'s* warehouse.

The Plan also notes simulation drills in the implementation of the Operational Contingency Plan will be carried out with the participation of all the concerned/relevant members of the organization. The purpose of these simulation drills will be to test the procedures, equipment, and resources described in the Plan, and to train personnel in emergency responses. Each simulation drill will be evaluated, and a report will be produced, including a photographic record, chronological record, and final recommendations.

Call-out procedures and 24-hour contact information for the coordinators and response team members are clearly stated in the Plan. It contains flow charts describing the call out procedures for Level I and Level II emergencies. Appendix A details 24-hour contact information for all internal and external persons involved in the Emergency Response.

Duties and responsibilities of the coordinators and team members are specified in the Plan. It clearly specifies the duties for all Emergency Response Team (ERT) positions.

The Plan includes a list of the emergency response equipment and its location which is available at the transference plant, including procedures to inspect emergency response equipment and assure its availability when required. The Plan clearly describes the role of outside responders.

It includes an annual inspection schedule for all emergency equipment in the Plant and one specific inspections schedule for cyanide first aids as oxygen and cyanide antidotes, also for Tyvek suites and HCN detectors.

In addition to the staff of ORICA, external Support from Civil Defense and Callao Firefighters will be required to achieve a more effective emergency response, allowing

to coordinate even the evacuation of neighbors, who could potentially be affected by the emergency event. ORICA's Cyanide Operations Manager assumes responsibility for control and mitigation of the emergency event.

Orica has provided documentation of the ERP to the Civil Defense Authority, Fire Brigade, Police, confirming their awareness and engaging them in ongoing development of emergency arrangements. Orica has determined that the role required of these organizations is such that they do not need to be involved in all mock drills, therefore they have not been included as necessary in mock drills and implementation exercises.

Production Practice 5.4: Develop procedures for internal and external emergency notification and reporting.

The operation is

☑ in full compliance with Production Practice 5.4

☐ in substantial compliance with

☐ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The Contingency Plan contains flow charts describing the call out procedures for emergencies. Management, contractors, emergency response team, outside response providers and medical facilities are included within the flow charts. Duties for all positions and entities listed within the Contingency Plan are clearly described.

The Contingency Plan includes contact information for any regulatory agencies required to be notified. Appendix A of the Contingency Plan details 24-hour contact information for all internal and external persons detailed in the Contingency Plan.

The transfer facility is in the APM container warehouse which is, in turn, located within an industrial area. The closest residential community is approximately *500 m* from the APM gate.

Orica has a hazard evaluation undertaken for the transfer facility. The evaluation identified the worst-case scenario at the transfer facility would involve dropping an IBC during a transfer operation resulting in a maximum spillage of 1.1 tons of solid cyanide. It was determined that the zone of influence of such a case was limited to the transfer facility building. The immediate response and cleanup as described in the Contingency Plan limits the generation of HCN and the zone of influence.

The Plan describes the procedure to notify the external support to achieve a more effective emergency response, which allows Orica to coordinate even the evacuation of neighbors, who could potentially be affected by the emergency event. The emergency response procedures also include measures for contacting and communicating with the media in the event of an emergency.

Production Practice 5.5: Incorporate into response plans and remediation measures monitoring elements that account for the additional hazards of using cyanide treatment chemicals.

The operation is

☑ in full compliance with Production Practice 5.5

☐ in substantial compliance with

☐ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The Contingency Plan describe specific measures to recovery and to neutralize sodium cyanide spills as the safety equipment level "C" suit, full face mask, rubber boots and neoprene gloves, all of these sealed with adhesive tapes. Use clean, non-sparking tools to scoop up material and place it in plastic lined containers for later disposal. Requires the use of bags with sand or earth, to confine the sodium cyanide (NaCN) preventing it from going to the sewers or water courses that can complicate the problem.

To recover a cyanide spill the procedure requires approaching with the wind blowing on the back, proceed to cover the spill with a plastic blanket and then collect the sodium cyanide with brooms and dustpans and place it in plastic bags which must be sealed and labeled. In the presence of water or acids, first neutralize the solid sodium cyanide (NaCN) with lime. Proceed to the elimination of the waste through the authorized contractor Green Care.

Provision of an alternate drinking water supply is not considered in the Plan as personnel in the transference plant and from APM´s warehouse only consume bottle water. By other side, supply of water for the plant is made by mean of tanks (cisterns) of water.

There is no surface water in the transference plant or its surroundings. Closest surface water bodies to the property are the Pacific Ocean 1,500 m to the west and the Chillón River 2,000 m north of the site.

According to the ICMI Auditor Guidance for Use of the Mining Operations Verification Protocol, the auditor considers this prohibition does not apply as the plant also does not have drainages that connect to surface water gradient below. All drainages in the plant are collected into an internal tank and the water is transferred to the Isotanks during the transference process. In the area where the plant is located annual precipitation rate is very low, being 9.3 mm /year as average of the last 10 years according to data from INEI (National Institute of Statistics and Informatics).

At the end of a spill event and in a post-emergency scenario, the Plan states for environmental monitoring and that soils should be evaluated, provided that it has been presented in an area or area that does not guarantee soil watertightness (the transfer plant has an insulation membrane), in such a way as to ensure that sodium cyanide

product has not filtered and contaminated the subsurface or effluents that could exist below.

Production Practice 5.6: Periodically evaluate response procedures and capabilities and revise them as needed.

The operation is

☑ in full compliance with Production Practice 5.6

☐ in substantial compliance with

☐ not in compliance with

Summarize the basis for this Finding/Deficiencies Identified:

The Contingency Plan contains provisions for periodically reviewing and evaluating its adequacy, and they are being implemented. It states that it must be updated periodically when the conditions or circumstances of the transfer plant and its activities vary significantly. Also states the Plan will be updated according to the results of the drill or when an emergency occurs; in other cases, possibilities for improvement are identified for emergency care.

The auditor reviewed v11 of the Contingency Plan dated September 2020; older versions of the Plan were developed for the previous Orica´s transference plant now dismantled.

Mock emergency drills are conducted bi-monthly to test response procedures for various exposure scenarios. During the current operation, Orica conducted several drills. In all cases the scenarios were analyzed, and recommendations developed. The scenarios highlighted several issues during the evaluations processes. The recommendations have been highlighted in the debrief reports and responsible persons have been assigned to close out the required actions.

The Contingency Plan requires to be evaluated and a report produced, including a photographic record, chronological record, and final recommendations, after any emergency that required its implementation. Such reviews have not been conducted as the Contingency Plan was not activated to date.