



MAY 2018

ICMI RECERTIFICATION SUMMARY AUDIT REPORT

Pueblo Viejo Mine Dominican Republic

REPORT

Submitted to:

International Cyanide Management Institute (ICMI)
1400 I Street NW-Suite 550
Washington, D.C. 20005
United States of America

And

Pueblo Viejo Dominicana Corporation
Novo – Centro, Piso 16
Av. Lope de Vega No. 29, Ens. Naco
Santo Domingo
Dominican Republic

Project Number: 1783951

Distribution:

ICMI – one PDF
PVDC – one PDF





Table of Contents


1.0 SUMMARY AUDIT REPORT FOR GOLD MINING OPERATIONS	1
2.0 LOCATION DETAIL AND DESCRIPTION OF OPERATION	2
Mine Location.....	2
Background.....	3
3.0 SUMMARY AUDIT REPORT.....	6
PRINCIPLE 1 – PRODUCTION.....	7
PRINCIPLE 2 – TRANSPORTATION.....	8
PRINCIPLE 3 – HANDLING AND STORAGE.....	10
PRINCIPLE 4 – OPERATIONS	13
PRINCIPLE 5 – DECOMMISSIONING	24
PRINCIPLE 6 – WORKER SAFETY.....	26
PRINCIPLE 7 – EMERGENCY RESPONSE	30
PRINCIPLE 8 – TRAINING.....	35
PRINCIPLE 9 – DIALOGUE	38
FIGURES	
Figure 1: Regional Location Map	2
Figure 2: Site Layout.....	5



1.0 SUMMARY AUDIT REPORT FOR GOLD MINING OPERATIONS

Name of Mine: Pueblo Viejo Mine
Name of Mine Owner: Barrick Gold Inc.
Name of Mine Operator: Pueblo Viejo Dominicana Corporation
Name of Responsible Manager: Richmond Fenn, General Manager
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Av. Lope de Vega No. 29, Ens. Naco
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Pueblo Viejo Mine
Name of Facility



Signature of Lead Auditor

May 22, 2018
Date



2.0 LOCATION DETAIL AND DESCRIPTION OF OPERATION

Mine Location

The Pueblo Viejo Mine (Pueblo Viejo) is located in the Dominican Republic approximately 100 kilometers (km) northwest of the capital city of Santo Domingo (Figure 1). Barrick Gold Corporation (Barrick) holds a 60 percent interest and is the operator; Goldcorp Inc. (Goldcorp) holds the remaining 40 percent interest. The Pueblo Viejo Mine is operated by Pueblo Viejo Dominicana Corporation (PVDC).



Figure 1: Regional Location Map

Pueblo Viejo Mine
Name of Facility

Kat R. Jones
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May 22, 2018
Date



Background

The Pueblo Viejo Mine is located in the Dominican Republic approximately 100 km northwest of the capital city of Santo Domingo (Figure 1). Barrick holds a 60 percent interest and is the operator; Goldcorp holds the remaining 40 percent interest. Small communities within approximately 25 km of the mine include Cotui, Maimon, Piedra Blanca, Socorro, Palo de Cuaba, and others. Pueblo Viejo started operating in 2012.

Pueblo Viejo consists of mining and processing ore from the expansion of two existing open pits: the Monte Negro Pit and the Moore Pit. The ore is processed to recover gold, silver, and copper. The tailings from the processing plant are pumped to the tailings storage facility (TSF) in the Llagal Valley. Lime for the processing plant is supplied by mining from limestone quarries at the site. The principal project components for the Pueblo Viejo mine site are shown in Figure 2.

The mine life is currently projected at approximately 28 years. During the mine life, the higher grade ores are processed, and lower grade ores placed in the low grade stockpiles. After active mining ceases, these lower grade ores may be processed.

The ore and waste rock are mined using hydraulic shovels and are supplemented with front-end loaders as needed. The material is transported in haul trucks. There is a pit dewatering system to handle surface runoff into the pits and pumping of groundwater inflow to stabilize the pit highwalls.

The run-of-mine ore is routed to the primary gyratory crusher. The crushed ore is placed in the coarse ore stockpile. Lower grade run-of-mine ore is placed in the low grade stockpiles. The waste rock is trucked to the El Llagal Tailings Storage Facility and is co-disposed with the tailings from the ore processing.


Limestone is excavated from onsite quarries and is used in the copper recovery circuit as well as for water treatment. The limestone is mined using front-end loaders and loaded into haul trucks. The limestone is crushed in a primary gyratory crusher and fed to a limestone bin. The limestone is ground in a Semi-Autogenous Grinding (SAG) mill followed by a ball mill. There are three lime kilns with an associated lime-slaking ball mill.

The crushed ore is ground in a SAG mill followed by a ball mill. The oversized material from the SAG mill is sent to a pebble cone crusher. The ground ore is sent to a 70-meter (m) diameter thickener.

The thickened ore slurry is pumped to the pressure oxidation circuit. The ore slurry is fed to four autoclaves, where the sulfide minerals are oxidized. Oxygen for the process is supplied from an onsite oxygen plant.

The oxidized ore slurry is pumped to five ceramic-lined hot cure tanks. The slurry is then fed to three 70-m diameter Counter-Current-Decant (CCD) thickeners. The overflow from the CCD thickeners is sent to the

Pueblo Viejo Mine
Name of Facility


Signature of Lead Auditor

May 22, 2018
Date



ICMC RECERTIFICATION SUMMARY AUDIT REPORT

copper recovery circuit. The solution is treated with limestone and air to increase the pH and precipitate the ferric oxyhydroxides. The treated solution is thickened prior to copper recovery. The copper precipitates as a copper sulfide and is stored in a concentrate stockpile and shipped overseas to smelters.

The ore slurry underflow from the CCD thickeners is sent to the cyanide leaching circuit. The ore slurry is pumped to 11 Carbon-in-Leach (CIL) tanks where cyanide is added to dissolve the gold and silver into solution. Activated carbon is added to adsorb the gold and silver. The loaded carbon is screened and sent to the refinery.

The loaded carbon is acid-washed prior to stripping the gold and silver from the carbon using a strong cyanide solution. The pregnant cyanide solution is piped to 16 electro-winning cells where the gold and silver are recovered as sludge. This sludge is retorted in two retorts to recover mercury naturally present in the ore. The retorted material is fed to a furnace, and the product is a gold-silver doré bar.


The ore slurry tailings from the CIL circuit are sent to a cyanide destruction circuit prior to being pumped to the TSF. In addition, the underflow from the High Density Sludge (HDS) Neutralization Circuit and Effluent Treatment Plant (ETP) thickener are sent to the TSF.

The TSF is located in the Lower El Llagal basin and has a storage capacity (both tailings and waste rock) of 249 million tonnes. The solids settle in the tailings impoundment and the decant water is recycled to the process plant or ETP using a reclaim barge and pipe system only when WAD cyanide concentrations are less than 0.5 parts per million (ppm).

It should be noted that there are two existing tailings impoundments from the historic operations: the Mejita Tailings Pond and the Las Lagunas Tailings Pond. Both tailings impoundments are outside the project development area and are the responsibility of the Dominican government or mining concerns not associated with PVDC.

The primary power source for Pueblo Viejo is the Quisqueya 1 Power Plant located on the south coast of the Dominican Republic near the city of San Pedro de Macoris. The plant is a heavy-fuel-oil facility consisting of 12 generators of 18 megawatt (MW) capacity each for a total plant capacity of 215 MW. There is a 111-km long double-circuit 230 kilovolt (kV) transmission line from the power plant to the mine. In addition, there is an electrical substation located near Piedra Blanca, which connects to the national electrical supply grid. There are also six stand-by/emergency power generators at the mine, each rated at 2.5 MW for a total of 15 MW.

Pueblo Viejo Mine
Name of Facility


Signature of Lead Auditor

May 22, 2018
Date



ICMC RECERTIFICATION SUMMARY AUDIT REPORT

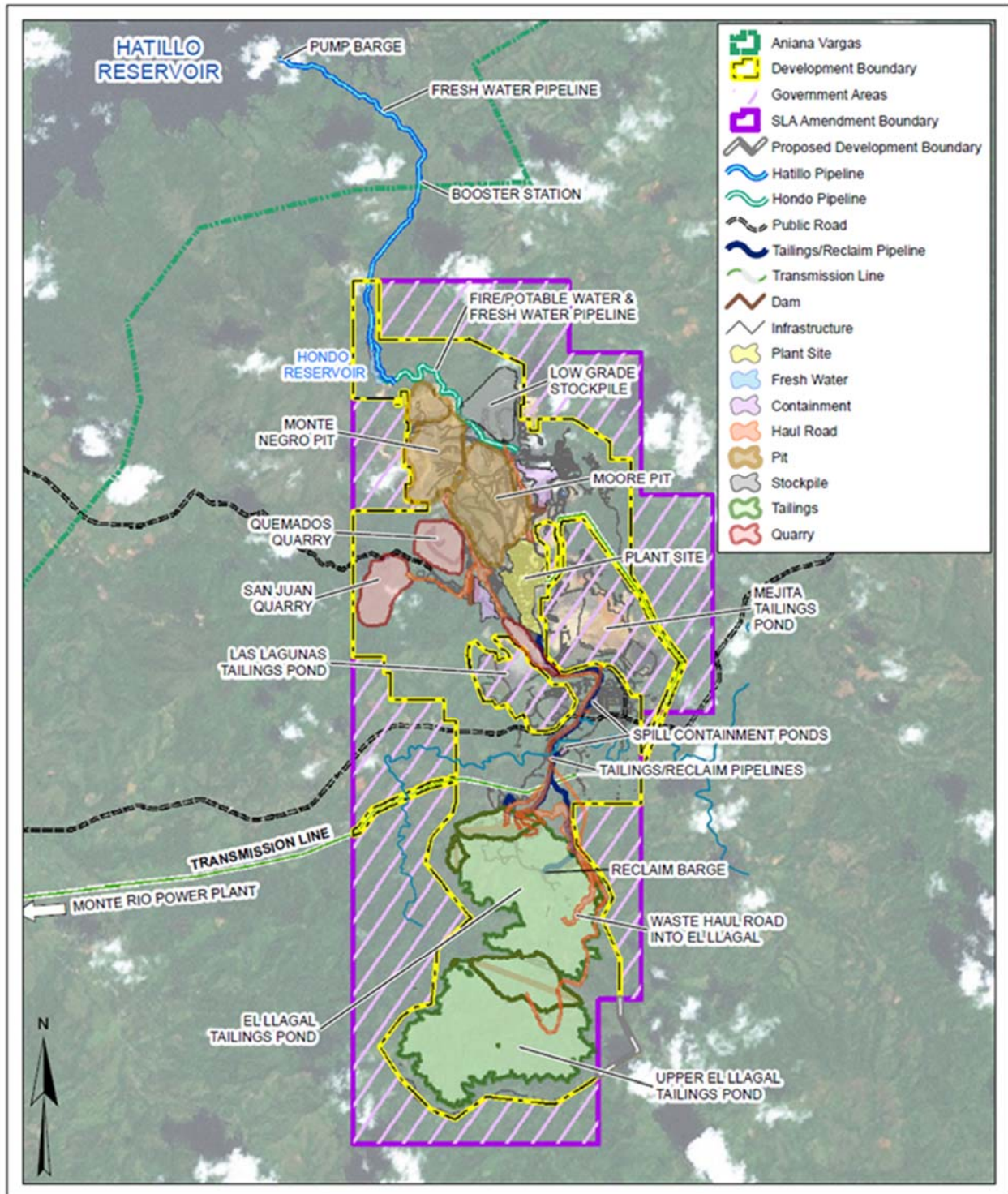


Figure 2: Site Layout

Pueblo Viejo Mine
Name of Facility

Kat R. Jones
Signature of Lead Auditor

May 22, 2018
Date



3.0 SUMMARY AUDIT REPORT

Auditors Findings

in full compliance with

The International
Cyanide Management
Code

Pueblo Viejo Mine is: in substantial compliance with

not in compliance with


Audit Company: Golder Associates

Audit Team Leader: Kent Johnejack, Lead Auditor and Technical Specialist

Email: kjohnejack@golder.com

The operation has not experienced compliance problems during the previous 3-year audit cycle.

Name of Other Auditors

Name, Position	Signature
Ivon Aguinaga, ICMI Pre-certified Mine Technical Specialist	


Dates of Audit

The Recertification Audit was undertaken within 4 days between December 4 and 7, 2017.

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 Mining Operations Verification and using standard and accepted practices for health, safety and environmental audits.

Pueblo Viejo Mine
Name of Facility


Signature of Lead Auditor

May 22, 2018
Date

Pueblo Viejo Mine
Name of Facility


Signature of Lead Auditor

May 22, 2018
Date



PRINCIPLE 1 – PRODUCTION

Encourage Responsible Cyanide Manufacturing by Purchasing from Manufacturers that Operate in a Safe and Environmentally Protective Manner

Standard of Practice 1.1: Purchase cyanide from manufacturers employing appropriate practices and procedures to limit exposure of their workforce to cyanide, and to prevent releases of cyanide to the environment

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 1.1

not in compliance with

Summarize the basis for this finding/deficiencies identified:

The operation is in full compliance with Standard of Practice 1.1, requiring the operation purchase cyanide from manufacturers employing appropriate practices and procedures to limit exposure of their workforce to cyanide and to prevent releases of cyanide to the environment.

PVDC has purchased cyanide from a manufacturer employing appropriate practices and procedures to limit exposure of their workforce to cyanide, and to prevent releases of cyanide to the environment. PVDC has established a contract with the Chemours Company (Chemours, previously E. I. DuPont de Nemours and Company). This contract was amended in October 2014 to extend the contract term from December 31, 2016 to December 31, 2019. Section 15.5 of the contract states that PVDC and Chemours agree to comply with the Code. PVDC purchases cyanide from Chemours who manufactures it at their production facility in Memphis, Tennessee. This facility has been certified under the Code during the recertification period. Its most recent recertification was obtained on September 16, 2016. PVDC purchases cyanide only from Chemours; PVDC does not use any independent distributors.

Pueblo Viejo Mine
Name of Facility

Kat R. Jones
Signature of Lead Auditor

May 22, 2018
Date





PRINCIPLE 2 – TRANSPORTATION

Protect Communities and the Environment during Cyanide Transport

Standard of Practice 2.1: Establish clear lines of responsibility for safety, security, release prevention, training and emergency response in written agreements with producers, distributors and transporters.

The operation is [X] in full compliance with [] in substantial compliance with [] not in compliance with Standard of Practice 2.1

Summarize the basis for this finding/deficiencies identified:

The operation is in full compliance with Standard of Practice 2.1, requiring that the operation establish clear lines of responsibility for safety, security, release prevention, training and emergency response in written agreements with producers, distributors and transporters.

PVDC has established clear lines of responsibility for safety, security release prevention, training and emergency response in written agreements with their producer and transporters. Chemours is responsible for the cyanide supply chain from their production plant in Memphis, Tennessee to the mine storage facilities (as indicated in Section 7.7 of the supply and sales agreement), including the transportation to the port of Rio Haina in the Dominican Republic and from there to the mine site. Also, Chemours contracted with Maritima Dominicana, S.A. (MarDom) for land transportation from the port of Rio Haina to PVDC.

According to Section 7.7 of the supply and sales agreement between PVDC and Chemours and Exhibit A to the agreement between Chemours and MarDom, all designated responsibilities extend to any subcontractors used.

PVDC in full compliance because the entire Chemours supply chain from their plant in Tennessee, through PVDC has been certified. The auditors reviewed the supply agreements and supply chain audit reports on the ICMI website to confirm compliance.

Standard of 2.2: Require that cyanide transporters implement appropriate emergency response plans and capabilities and employ adequate measures for cyanide management

The operation is [X] in full compliance with [] in substantial compliance with [] not in compliance with Standard of Practice 2.2

Summarize the basis for this finding/deficiencies identified:

Pueblo Viejo Mine Name of Facility

[Signature] Signature of Lead Auditor

May 22, 2018 Date





ICMC RECERTIFICATION SUMMARY AUDIT REPORT


The operation is in full compliance with Standard of Practice 2.2, requiring that cyanide transporters implement appropriate emergency response plans and capabilities and employ adequate measures for cyanide management.

PVDC has required that cyanide transporters implement appropriate emergency response plans and capabilities and employ adequate measures for cyanide management. Section 15.5 of the supply contract between Chemours and PVDC states that “Seller and Buyer covenant and agree to comply with the Principles and Standards of Practice of the International Cyanide Management Code during the manufacture, transportation, storage, use, and disposal of Product”. Page 8 of Exhibit A, Scope of Work, to the agreement between Chemours and MarDom states the transporter “...shall achieve full compliance under the Cyanide Code and associated certification” and that the transporter “shall maintain Cyanide Code compliance, and associated activities, during the entirety of the relationship”.

The Chemours supply chain from the plant in Memphis, Tennessee to, and including, the port at Rio Haina was most recently recertified on August 18, 2017 (under Chemours Global Ocean Supply Chain). MarDom supply chain from the port of Haina to PVDC was most recently recertified on June 29, 2016.

PVDC provided bills of lading and Transportation Reports from MarDom on the cyanide supply chain from the production facility in Memphis in the U.S., to the mine site. This information identified all elements of the supply chain. The most recent recertification reports posted on the ICMI website confirm that all transporters to PVDC are recertified under the Code.

Pueblo Viejo Mine
Name of Facility



Signature of Lead Auditor

May 22, 2018
Date



PRINCIPLE 3 – HANDLING AND STORAGE

Protect Workers and the Environment during Cyanide Handling and Storage

Standard of Practice 3.1: Design and construct unloading, storage and mixing facilities consistent with sound, accepted engineering practices, quality control/quality assurance procedures, spill prevention and spill containment measures.

[X] in full compliance

The operation is [] in substantial compliance with with Standard of Practice 3.1

[] not in compliance with

Summarize the basis for this finding/deficiencies identified:

The operation is in full compliance with Standard of Practice 3.1, requiring that cyanide handling and storage facilities are designed and constructed consistent with sound, accepted engineering practices, quality assurance/quality control (QA/QC) procedures, spill prevention and spill containment measures.

PVDC has received solid cyanide in two ways this audit cycle: 1) supersacks that are packed inside Sea-Land containers, 2) isotainers. MarDom transports cyanide in a convoy to the site, through the PVDC gate, and to the nearby cyanide storage area within the reagents pad. At the transfer building PVDC transfers the supersacks from the MarDom Sea-Land containers to PVDC Sea-Land containers. The containers are then stored inside a fenced area within the overall reagents pad. Isotainers are directly driven to the mixing area at the refinery. Empty Sea-Land containers are stored at the cyanide storage area, as are empty isotainers until they can be returned to the vendor.

The cyanide storage area, the transfer facility, and the mixing area achieved compliance at the time of the initial certification audit and there have been no changes since that time. These facilities were appropriately designed and constructed; compliance is based on the designs, letters, construction quality assurance records, and turnover packages that were reviewed during the initial audit.

PVDC has not changed the unloading and storage areas since the initial audit and those findings are still valid. PVDC has located unloading and storage areas away from people and surface water. The cyanide storage area, transfer building, and mixing area are all located within fenced and gated areas with security. There are no surface water bodies or communities near either of these facilities.

Although PVDC does not receive liquid cyanide, the transfer building and the mixing area at the refinery are designed and constructed to contain, recover, and return cyanide solutions (if any) to the process circuit. The auditors observed these facilities to be in good condition.

Pueblo Viejo Mine
Name of Facility

[Signature]
Signature of Lead Auditor

May 22, 2018
Date





ICMC RECERTIFICATION SUMMARY AUDIT REPORT

PVDC has a mixing tank and a storage tank for reagent grade cyanide. Both have level sensors to prevent overfilling. The auditors observed the screens in the control room and reviewed maintenance records from throughout the recertification period to verify that the sensors were working and properly maintained.

As described in the initial certification report, the mixing and storage tanks were installed on solid concrete bases within concrete secondary containments that prevent seepage to the subsurface and are a competent barrier to leakage. There have been no changes to the tank bases or containments since that time. The auditors observed that these tank bases and containments continue to be in good condition.

PVDC stores cyanide at the cyanide storage area and the mixing area at the refinery with adequate ventilation, with minimal potential for contact with water, in a secure area, and separately from incompatible materials. Sea-Land containers, isotainers, the mixing tank, and the storage tank are located outside and therefore are well-ventilated. In addition, they are all suitable to protect cyanide from water. PVDC provides multiple layers of security at the cyanide storage area and the mixing area at the refinery. No other materials are stored, incompatible or otherwise, are stored with the cyanide.

Standard of Practice 3.2: Operate unloading storage and mixing facilities using inspections, preventative maintenance and contingency plans to prevent or contain releases and control and respond to worker exposures.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 3.2

not in compliance with


Summarize the basis for this finding/deficiencies identified:

The operation is in full compliance with Practice 3.2 requiring that cyanide handling and storage facilities are operated using inspections, preventive maintenance and contingency plans to prevent or contain releases and control and respond to worker exposures.

PVDC receives solid cyanide in supersacks and isotainers. PVDC triple-rinses the inner bags of the supersacks, samples and analyses the last rinsewater, and re-rinses if necessary. All components of the supersacks are then tracked through incineration at the onsite facility, thereby preventing their reuse. Empty isotainers are stored at the cyanide storage area within the reagents pad until they are returned to the vendor.

PVDC has developed and implemented procedures to prevent exposures and releases during transfer of the supersacks between MarDom’s and PVDC’s Sea-Land containers, during transport of the Sea-Land containers to the refinery, and for mixing the supersacks at the mixing tank. A series of six procedures governs these activities including operation of valves and couplings; safe handling to prevent rupture; and

Pueblo Viejo Mine
Name of Facility


Signature of Lead Auditor

May 22, 2018
Date




ICMC RECERTIFICATION SUMMARY AUDIT REPORT

spill cleanup. The cyanide supersack mixing procedure requires two operators (as well as video observation from the control room) and specifies personal protective equipment (PPE) consisting of rubber boots, chemical protective suit, rubber gloves, full face mask, hard hat, portable hydrogen cyanide (HCN) monitor, and a radio. The procedure for management, transfer, and storage of cyanide limits the stacking of the Sea-Land containers to three high, but the auditors observed one-high stacking at the time of the site visit.

PVDC has developed and implemented an additional procedure to prevent exposures and releases during isotainer mixing. This procedure describes operation of valves and couplings, specifies the same PPE as for supersack mixing, and requires two operators, as well as video observation from the control room. The auditors observed an isotainer mixing event to verify compliance.

The procedures for transfer at the transfer building, transport to the refinery, mixing supersacks, and offloading isotainers are accompanied by pre-work inspections checklists. The auditors observed completed examples of these pre-work inspections from throughout the recertification period to verify compliance.

Pueblo Viejo Mine
Name of Facility



Signature of Lead Auditor

May 22, 2018
Date



PRINCIPLE 4 – OPERATIONS

Manage Cyanide Process Solutions and Waste Streams to Protect Human Health and the Environment

Standard of Practice 4.1: Implement management and operating systems designed to protect human health and the environment including contingency planning and inspection and preventative maintenance procedures.

[X] in full compliance with

The operation is

[] in substantial compliance with

Standard of Practice 4.1

[] not in compliance with

Summarize the basis for this finding/deficiencies identified:

The operation is in full compliance with Standard of Practice 4.1, requiring that the operation implement management and operating systems designed to protect human health and the environment including contingency planning and inspection and preventive maintenance procedures.

PVDC has prepared and implemented management systems, plans and procedures for all cyanide facilities (i.e., those with 0.5 parts per million [ppm] Weak Acid Dissociable [WAD] cyanide or greater). The cyanide facilities are the: transfer building; Sea-Land container storage area; temporary storage area for Sea-Land containers at the plant; mixing and storage tank area; CIL area; stripping area; cyanide destruct area; plant emergency pond; TSF and its seepage collection pond, pipelines, and two spill ponds along the pipeline route; and the pipes, pumps, sumps, containments, etc. associated with these facilities. Reclaim water is returned to the process plant or the effluent treatment plant (ETP) only when WAD cyanide concentrations area less than 0.5 ppm.

The following are not cyanide facilities because PVDC designed the plant so that they use solutions with less than 0.5 ppm WAD cyanide: milling area, autoclaves, CCD cells, copper sulfide circuit, ETP, HDS water treatment plant (WTP), acid rock drainage (ARD) pond #1, and ARD pond #3.

PVDC has developed written management systems, plans, and procedures for operating the cyanide facilities. The management systems include the Barrick Health and Safety Management System and the Responsibility Information Management System (RIMS), as well as ISO 14001 certification for environmental management.

PVDC has developed management plans and standard operating procedures (SOPs) describing the design and operating criteria, and practices necessary for the safe and environmentally sound operation of the cyanide facilities, including the specific measures needed for compliance with the Code and regulatory requirements. The management plans cover cyanide, water, hazardous materials, and waste. The SOPs

Pueblo Viejo Mine
Name of Facility

[Signature]
Signature of Lead Auditor

May 22, 2018
Date





ICMC RECERTIFICATION SUMMARY AUDIT REPORT

cover logistics, process, maintenance, emergency power, document control, safety, and emergency response. The auditors reviewed the management plans and SOPs to verify compliance and to confirm that they had been updated since the initial certification audit.

PVDC has developed and implemented a written procedure to evaluate changes to the cyanide facilities or cyanide activities. The auditors reviewed nine management of change forms, signed by safety and environmental staff (among others), during the recertification period to verify compliance.


PVDC has pre-planned contingency procedures in various plans and procedures. The Emergency Management and Response Procedure covers contingency actions for earthquakes, explosions, chemical spills, cyanide poisoning, terrorism, bomb threats, structural fires, gas inundation, structural failure, hurricanes, and floods. Upsets in the site-wide water balance are discussed in PowerPoint presentation for the GoldSim model. Alert levels and event-driven special inspections are prescribed in the Tailings Operation, Maintenance, and Surveillance Plan for the TSF. Several cyanide-specific contingency plans are described in SOPs on spill pond management, cyanide gas response, cyanide spill response, and cyanide fire response. Temporary closure and cessation of operations are covered in the Closure Management Plan.

PVDC has performed and documented inspections at the cyanide facilities to assure that they are functioning within design parameters. Inspections consisted of forms, operator logs/reports, excel spreadsheets, and formal reports. The frequencies were: each occurrence (i.e., pre-work), shift, daily, weekly, monthly, annual, and random, depending on the type of facility or activity. The auditors reviewed examples of completed inspection forms from throughout the recertification period to verify compliance.

PVDC performs specific inspections as required by the Code. PVDC performs visual and non-destructive testing on cyanide-related tanks, vessels, and piping on the schedule prescribed in American Petroleum Institute (API) 653 Standard to identify signs of corrosion and leakage. PVDC monitors the seepage (if any) from the release prevention barriers for the CIL tanks and cyanide destruct vessels on a regular monthly basis, including collection of samples for laboratory analysis of WAD cyanide. PVDC operators inspect pipelines, pumps and valves for deterioration and leakage on a daily basis. PVDC regularly inspects the TSF and measures water levels daily to ensure freeboard is maintained. The plant emergency pond, TSF seepage pond, and the two TSF pipeline spill ponds are also inspected regularly to ensure they are available for use. There are no surface water diversions requiring inspection. The auditors reviewed examples of all of these inspections to verify that PVDC to verify compliance.

PVDC documents inspections hardcopy and electronic forms. These forms include the name of the inspector, the date of the inspection, a series of questions with yes/no answers, and extra columns or rows

Pueblo Viejo Mine
Name of Facility


Signature of Lead Auditor

May 22, 2018
Date



ICMC RECERTIFICATION SUMMARY AUDIT REPORT

for comments and observations in the case of deficiencies. Corrective actions and their completion dates are tracked in the Oracle database by the maintenance department

PVDC ensures that equipment and devices function as intended by a scheduled (proactive) and unscheduled (reactive) preventative maintenance program in an Oracle database. The auditors reviewed work histories from the Oracle database for randomly selected cyanide equipment, as well as pH meters and fixed HCN monitors, to verify compliance throughout the recertification period.

PVDC has six backup generators to power pumps and other equipment to prevent unintentional releases and exposures in the event of a power failure. PVDC operates, maintains and tests the backup generators according to a written procedure. The auditors reviewed evidence of monthly generator run tests and weekly maintenance to verify compliance.

Standard of Practice 4.2: Introduce management and operating systems to minimise cyanide use, thereby limiting concentrations of cyanide in mill tailings.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 4.2


not in compliance with

Summarize the basis for this finding/deficiencies identified:

The operation is in full compliance with Standard of Practice 4.2, requiring that the operation limit the use of cyanide to that optimal for economic recovery of gold so that the waste tailings material has as low a cyanide concentration as practical.

PVDC has implemented management and operating systems to minimize cyanide use and limit cyanide concentrations in tailings. PVDC conducts bottle roll tests periodically to confirm the target addition rate of 0.5 kilograms per ton, although higher addition rates are needed when there is interference from high copper levels in the feed ore. PVDC has used a manual control strategy for years, but at the time of the recertification site visit, on-line cyanide analyzers were being installed for evaluation. Throughout the recertification period, however, PVDC has implemented a manual control strategy according to a written cyanide control philosophy by means of samples collected every 3 hours from CIL Tanks 1, 2, 4, 5, and 11. The target cyanide addition rate is documented on the whiteboard in the control room. The auditors reviewed CIL Supervisors Shift Reports to verify that manual control of cyanide addition was performed throughout the recertification period. It should be noted, however, that PVDC operates a cyanide destruct circuit as the primary means to limit concentrations of cyanide in tailings.

Pueblo Viejo Mine
Name of Facility


Signature of Lead Auditor

May 22, 2018
Date



ICMC RECERTIFICATION SUMMARY AUDIT REPORT

Standard of Practice 4.3: Implement a comprehensive water management programme to protect against unintentional releases.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 4.3

not in compliance with

Summarize the basis for this finding/deficiencies identified:

The operation is in full compliance with Standard of Practice 4.3, requiring the operation to implement a comprehensive water management program to protect against unintentional releases.


PVDC has developed a comprehensive and probabilistic mine-wide water and chemical balance model. Development of the GoldSim model began in 2014 and has continued through Version 7.1 in 2017. The GoldSim model water balance is comprehensive in that it considers the appropriate factors for inflows and outflows. With respect to the TSF, the inflows include the treated tailings; treated effluent from the HDS plant for the copper recovery circuit; treated effluent from the ETP for acid rock drainage; direct precipitation, runoff from uphill areas, and seepage pumped back from the seepage collection pond. The water balance also includes that volume of waste rock that is placed in the tailings impoundment for co-disposal and the water entrained in the rock. The outflows include reclaim water, seepage, evaporation, and overflows (if any). The water balance is also comprehensive in that it considers the effect of dam raises on capacity and freeboard.

The water balance is probabilistic because it considers different design storms and wet periods such as the Probable Maximum Precipitation and the 200-year return period, 3-month duration wet period. The model is also probabilistic because GoldSim uses distributions, rather than single values for inputs, and stochastically runs multiple realizations for 900 years of daily synthetic rainfall data.

The model considers other factors as appropriate to the design, operation, and setting. The water balance does not directly model the effects of a power outage on the TSF. In the event of a power outage, all slurry and reclaim water movement to and from the TSF would stop. Therefore, the potential for overtopping the TSF is only a function of the other inflows, which are properly accounted for and tracked in the water balance. Runoff from uphill areas is included in the water balance. Freezing and thawing are inapplicable in the tropical conditions in the Dominican Republic. Solution is not discharged to surface water from the tailings impoundment and no other aspects of the facility design are relevant to the water balance.

PVDC inspects and monitors the TSF to implement the water balance and prevent overtopping. Water levels and beach levels are surveyed daily, and the information is compiled in a Daily Water Level Report

Pueblo Viejo Mine
Name of Facility


Signature of Lead Auditor

May 22, 2018
Date



ICMC RECERTIFICATION SUMMARY AUDIT REPORT

that shows the remaining freeboard volume. Other inspections are completed on a weekly, quarterly, and annual basis.

PVDC has designed the TSF with 1 m of freeboard above routed flood level from the Probable Maximum Precipitation event. The actual freeboard varies, as it is a function of the raise level (which is constantly increasing) and the pond level (which varies). The auditors reviewed a time series graph that showed that PVDC maintained the freeboard during the recertification period at greater than 10 m.

PVDC has installed multiple precipitation gages around the mine with AWS-06 being the closest to the TSF. The actual daily precipitation data are updated in the GoldSim model on a monthly basis and the model has been calibrated. The auditors observed spreadsheets of precipitation data from throughout the recertification period to verify compliance.

Standard of Practice 4.4: Implement measures to protect birds, other wildlife and livestock from adverse effects of cyanide process solutions.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 4.4

not in compliance with

Summarize the basis for this finding/deficiencies identified:


The operation is in full compliance with Standard of Practice 4.4, requiring the operation implement measures to protect birds, other wildlife and livestock from adverse effects of cyanide process solutions.

The only permanent open water containing cyanide is the TSF. The primary measure to protect wildlife at the TSF is cyanide destruction and blending of the treated slurry with two other non-cyanide effluent streams (the ETP and HDS effluents). PVDC provided time series graphs of analytical data that showed the maximum concentrations of WAD cyanide were approximately 48 ppm and 11 ppm in the tailings discharge and decant pool, respectively, during the recertification period.

PVDC environmental staff stated that the operation has not experienced any cyanide-related mortalities during the recertification period. This statement is based on daily wildlife inspections which are increased to twice daily during the bird migration season from February to September. The auditors reviewed these inspection forms to verify compliance. Therefore, maintaining the WAD cyanide concentration in the TSF at less than 50 ppm has been effective in preventing significant wildlife mortality.

PVDC does not have a heap leach facility; therefore, the question related to overspray of cyanide solutions is inapplicable.

Pueblo Viejo Mine
Name of Facility


Signature of Lead Auditor

May 22, 2018
Date



ICMC RECERTIFICATION SUMMARY AUDIT REPORT

Standard of Practice 4.5: Implement measures to protect fish and wildlife from direct or indirect discharges of cyanide process solutions to surface water.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 4.5

not in compliance with

Summarize the basis for this finding/deficiencies identified:

The operation is in full compliance with Standard of Practice 4.5, requiring the operation implement measures to protect fish and wildlife from direct or indirect discharges of cyanide process solutions to surface water.

PVDC has a direct discharge to surface water in the Margajita River from the ETP. PVDC provided analytical data for the ETP effluent that showed that the concentrations of WAD cyanide did not exceed 0.5 ppm during the recertification period.

PVDC has a mixing zone in the Margajita River from the ETP outfall to the Hatillo Reservoir.

PVDC has a mixing zone in the Margajita River from the ETP outfall to the Hatillo Reservoir. PVDC provided time series graphs of quarterly analyses of free cyanide from five surface water monitoring stations that showed non-detect values less than the 0.022 ppm threshold throughout the recertification period. Free cyanide was determined using EPA Method 9016, Free Cyanide in Water, Soils, and Solid Wastes by Micro-Diffusion.

PVDC has a potential indirect discharge to surface water from seepage at the toe of the TSF embankment. PVDC provided time series graphs of quarterly analyses of free cyanide from two surface water monitoring stations that showed non-detect values less than the 0.022 ppm threshold throughout the recertification period.

PVDC is not engaged in any remedial action related to surface water.

Standard of Practice 4.6: Implement measures designed to manage seepage from cyanide facilities to protect the beneficial uses of groundwater.

in full compliance with

The operation is


in substantial compliance with

Standard of Practice 4.6

not in compliance with

Summarize the basis for this finding/deficiencies identified:

Pueblo Viejo Mine
Name of Facility


Signature of Lead Auditor

May 22, 2018
Date



ICMC RECERTIFICATION SUMMARY AUDIT REPORT

The operation is in full compliance with Standard of Practice 4.6, requiring the operation implement measures designed to manage seepage from cyanide facilities to protect the beneficial uses of groundwater.

PVDC has implemented measures to protect the groundwater. The primary measure to protect groundwater is cyanide destruction and blending of the treated slurry with two other non-cyanide effluent streams (the ETP and HDS effluents). In addition, the plant was constructed with concrete floors to prevent seepage and a cyanide emergency pond to contain solutions during upset conditions. The cyanide emergency pond is lined with geomembrane underlain by compacted clay. The pipelines to and from the TSF were installed within a geomembrane-lined ditch with two geomembrane-lined spill ponds. The TSF itself has an unlined seepage collection pond at the toe of the embankment where seepage is pumped back to the TSF.

The Ministry of the Environment and Natural Resources in the Dominican Republic has designated the groundwater resources to have beneficial uses for domestic, industrial, and agricultural uses with a groundwater protection standard of 0.1 ppm total cyanide. PVDC provided time series graphs of quarterly total cyanide data from 12 groundwater compliance wells around the plant, ETP, and TSF that showed non-detect concentrations below the 0.1 ppm standard throughout the recertification period.

PVDC does not have an underground mine where tailings might be used as backfill, nor is PVDC engaged in any groundwater remediation.

Standard of Practice 4.7: Provide spill prevention or containment measures for process tanks and pipelines.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 4.7

not in compliance with


Summarize the basis for this finding/deficiencies identified:

The operation is in full compliance with Standard of Practice 4.7 requiring that the operation provide spill prevention or containment measures for process tanks and pipelines.

The plant and pipeline secondary containment measures are largely unchanged since the initial certification audit. Therefore, those findings are still valid and are updated below. The auditors observed that all secondary containment measures had remained in good condition during the recertification period.

PVDC provided a design study by Fluor that showed that the secondary containment routing and sizing for the mixing, storage, barren, CIL, acid wash, stripping, and destruct tanks, columns, and vessels are

Pueblo Viejo Mine
Name of Facility


Signature of Lead Auditor

May 22, 2018
Date



ICMC RECERTIFICATION SUMMARY AUDIT REPORT

compliant. The secondary containments for the mixing, storage, and barren tanks flow through to the CIL area. The acid wash and strip vessels have their own secondary containments. The CIL secondary containment, as well as the destruct secondary containment, has sumps to return solutions to the process circuit. Both the CIL and destruct containments also report via pipeline to the plant emergency pond, which provides final secondary containment for the plant.

The flow through secondary containment for the plant reports to the geomembrane-lined plant emergency pond that is sized for 110 percent of a single CIL column (i.e., the largest vessel in the plant). A single CIL tank has a volume of 4,708 cubic meters (m³) and the plant emergency pond has a volume of 5,200 m³. The plant emergency pond was originally equipped with a portable pump to return solutions to the plant but was upgraded to a permanent barge pump during the recertification period. There are no cyanide-related tanks, vessels, or columns without secondary containment.


All cyanide-related tanks and vessels are equipped with release prevention barriers that prevent seepage to the subsurface. The mixing, storage, barren, and acid wash tanks are installed on solid concrete bases. The CIL and cyanide destruction tanks are installed on ring beams with leak detection systems consisting of sand backfill over a geomembrane liner welded to the ring beam. Each leak detection system is equipped with an outlet valve so that leakage, if any, can be measured and sampled.

PVDC returns solutions from secondary containments to the CIL or destruct circuits via sumps with dedicated pumps. Sump pumps can handle the average hourly rainfall for a 200-year, 24-hour storm event. The auditors judged that this high pumping rate for emptying the secondary containments means that, in conjunction with the containment capacity for 110 percent of the largest tank in each containment, PVDC has provided an adequate integrated system for preventing releases in the unlikely event of a simultaneous storm and release from a tank. PVDC does not discharge solutions or rainwater in secondary containment to the environment.

PVDC has provided spill containment for all cyanide process pipelines to collect spills and prevent releases to the environment. All reagent grade pipelines and other process pipelines are located over concrete secondary containment within the plant. The high-density polyethylene (HDPE) pipelines to the cyanide emergency pond are pipe-in-pipe. PVDC does not have any underground pipes containing cyanide solutions.

PVDC has installed the tailings and reclaim pipelines within a geomembrane-lined open-topped channel between the plant and the El Llagal TSF. PVDC has also constructed geomembrane-lined spill ponds on either side of a river crossing along the pipeline route. The pipeline crossing over the river itself is in the same secondary containment channel that is on top of the culverts for the creek.

Pueblo Viejo Mine
Name of Facility



Signature of Lead Auditor

May 22, 2018
Date



ICMC RECERTIFICATION SUMMARY AUDIT REPORT

PVDC has constructed cyanide-related tanks, columns, vessels, and pipelines of stainless steel, carbon steel, and HDPE, all of which are compatible with high pH and cyanide.

Standard of Practice 4.8: Implement quality control/quality assurance procedures to confirm that cyanide facilities are constructed according to accepted engineering standards and specifications.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 4.8

not in compliance with

Summarize the basis for this finding/deficiencies identified:


The operation is in full compliance with Standard of Practice 4.8 requiring that operations implement QA/QC procedures to confirm that cyanide facilities are constructed according to accepted engineering standards and specifications.

As determined at the time of the initial certification audit, PVDC has implemented a complete program of construction quality assurance (CQA) for the plant. The program was governed by the Fluor Execution Plan that lists the following elements: specifications, CQA plan, observations, testing, reporting, as-builts, punch lists, turnover packages, and acceptance letters. The CQA program was applied mine-wide, but for the purposes of this audit, was specifically applied to the transfer building, mixing and storage area, the CIL area, the stripping area, the cyanide destruction area, and the plant emergency pond.

The CQA program for the plant consisted of the appropriate elements, such as earthworks, concrete, geomembrane, tanks, and piping. It included field observation and laboratory testing. Reports were signed by the field/laboratory staff and by reviewers to ensure quality. Final turnover packages and acceptance letters were signed by the contractor construction manager and four levels of PVDC management, thus providing evidence of review by qualified personnel that the cyanide facilities were constructed as designed. The auditors reviewed CQA documents, interviewed staff, and reviewed written testimony from engineers present at the time of construction to verify compliance.

PVDC has also implemented a CQA program for the TSF and the tailings pipelines. For the recertification audit, the auditors reviewed Record of Construction Reports that documented clearing and grubbing, abutment excavation, foundation preparation, foundation grouting, borrow materials suitability, construction materials (low permeability fill, fine filter coarse filter, rockfill, and rockfill transition), test fills, fill placement, compaction, design changes, specification modifications, non-conformances, corrective actions, instrumentation installation, and schedules of quantities. The Record of Construction Reports were reviewed by a professional engineer registered in Canada. PVDC also provided checklists and a turnover

Pueblo Viejo Mine
Name of Facility


Signature of Lead Auditor

May 22, 2018
Date



ICMC RECERTIFICATION SUMMARY AUDIT REPORT

package for the tailings pipelines to verify that CQA included the appropriate civil and mechanical components (hydrostatic testing, welding, valve function, etc.), and that were reviewed by a CQA supervisor.

Under a written procedure, PVDC has retained CQA records for the cyanide facilities electronically using the LiveLink document control system. The auditors observed this system to retrieve CQA information in use during the site visit. PVDC also maintains a document library at the TSF Office for records related to the TSF. The auditors observed the library to verify compliance.

Standard of Practice 4.9: Implement monitoring programs to evaluate the effects of cyanide use on wildlife, surface and groundwater quality.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 4.9

not in compliance with

Summarize the basis for this finding/deficiencies identified:


The operation is in full compliance with Standard of Practice 4.9 requiring that operations implement monitoring programs to evaluate the effects of cyanide use on wildlife, surface and groundwater quality.

PVDC has developed a written plan for monitoring surface water, groundwater, potable water, and treated water. PVDC has also developed a procedure for monitoring aquatic birds, the primary type of wildlife with the potential to contact cyanide solutions at the operation. In general, large native mammals are not found in the Dominican Republic. These plans were developed by qualified environmental/ecological scientists and engineers and have been most recently approved by the current environmental manager, a civil engineer with many years of experience in environmental compliance at mines in Peru. The water monitoring plan describes how samples should be collected, filtered, containerized, preserved, shipped (including chain-of-custody), and analyzed. Separate aerial photographs show the locations of the surface water monitoring stations and groundwater monitoring wells.

PVDC documents sampling conditions on an electronic field form, including temperature, weather, appearance of the water, and potential impacts from flora and fauna. The auditors reviewed completed examples of this form to verify compliance throughout the recertification period.

PVDC monitors surface water and groundwater downgradient of the cyanide facilities. For compliance purposes, PVDC monitors 7 surface water stations and 12 groundwater monitoring wells downgradient of the ETP, TSF, and plant. Surface water is monitored on a weekly to monthly to quarterly basis depending on the station. Groundwater is monitored on a monthly to quarterly basis depending on the well.

Pueblo Viejo Mine
Name of Facility


Signature of Lead Auditor

May 22, 2018
Date




ICMC RECERTIFICATION SUMMARY AUDIT REPORT

Compliance sampling, however, is typically on quarterly basis for both surface water and groundwater. The auditors consider these frequencies adequate to characterize these media and detect changes in a timely manner.

PVDC monitors for wildlife with an emphasis on aquatic birds. The TSF is monitored daily during from October to January and twice daily from February to September, the bird migration season. The plant is monitored daily and the plant emergency pond, which is typically empty, is monitored monthly.

Pueblo Viejo Mine
Name of Facility


Signature of Lead Auditor

May 22, 2018
Date



PRINCIPLE 5 – DECOMMISSIONING

Protect Communities and the Environment from Cyanide through Development and Implementation of Decommissioning Plans for Cyanide Facilities.

Standard of Practice 5.1: Plan and implement procedures for effective decommissioning of cyanide facilities to protect human health, wildlife and livestock.

[X] in full compliance with

The operation is

[] in substantial compliance with

Standard of Practice 5.1

[] not in compliance with

Summarize the basis for this finding/deficiencies identified:

The operation is in full compliance with Standard of Practice 5.1 requiring that the site plan and implement procedures for effective decommissioning of cyanide facilities to protect human health, wildlife and livestock.

PVDC provided the auditors with a decommissioning plan specifically for their cyanide facilities. This plan addresses cyanide stock reduction, cyanide disposal, plant cleanup, and decontamination of low, medium, and high cyanide areas. Figure 6, in the decommissioning plan, shows a reasonable sequence of decommissioning activities over a duration of 12 months. The auditors reviewed 2014 and 2017 versions of this plan to verify that it has been reviewed and updated this audit cycle.

Standard of Practice 5.2: Establish an assurance mechanism capable of fully funding cyanide related decommissioning activities.

[X] in full compliance with

The operation is

[] in substantial compliance with

Standard of Practice 5.2

[] not in compliance with

Summarize the basis for this finding/deficiencies identified:

The operation is in full compliance with the Standard of Practice 5.2 requiring that the site establish an assurance mechanism capable of fully funding cyanide related decommissioning activities.

PVDC has developed a 2017 cost estimate for the implementation of cyanide-related decommissioning activities. The auditors verified that the cost estimate was developed based on contractor rates. PVDC updates the cost estimate for the overall mine closure annually in accordance with Barrick corporate requirements. The spreadsheet specifically for decommissioning the cyanide facilities is extracted from this overall mine closure estimate. The auditors viewed two previous versions of the cost estimate, one

Pueblo Viejo Mine
Name of Facility

[Signature]
Signature of Lead Auditor

May 22, 2018
Date






ICMC RECERTIFICATION SUMMARY AUDIT REPORT

dated December 31, 2015 and the other dated December 31, 2016, and the current version of the cost estimate (November 2017) to confirm that the costs had been updated annually.

PVDC has a current lease agreement of mining rights with the Dominican Republic and other entities. The lease requires that PVDC deposit a reserve for closure activities in a bank account in an amount indicated in the agreement. The auditors reviewed a current statement letter of the bank account to verify that the account balance is greater than the November 2017 estimated cost for decommissioning the cyanide-related facilities.

Pueblo Viejo Mine
Name of Facility


Signature of Lead Auditor

May 22, 2018
Date



PRINCIPLE 6 – WORKER SAFETY

Protect Workers’ Health and Safety from Exposure to Cyanide

Standard of Practice 6.1: Identify potential cyanide exposure scenarios and take measures as necessary to eliminated, reduce and control them.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 6.1

not in compliance with

Summarize the basis for this finding/deficiencies identified:

The site is in full compliance with Standard of Practice 6.1 requiring that the site identify potential cyanide exposure scenarios and take measures as necessary to eliminate, reduce and control them.

PVDC has developed written SOPs and plans that describe the management and operation of the cyanide facilities. The SOPs and plans have been developed to eliminate, reduce and control exposure to cyanide. Individual task specific SOPs provide details for safe operation of the cyanide facilities, PPE requirements and inspection requirements (including pre-work inspections)

Pre-work inspections prior to cyanide unloading, transfer, transportation, and mixing are completed by the logistics and process personnel. Also, inspections of the cyanide facilities are conducted on a regular basis. Inspections include cyanide tanks, pipes, pumps, secondary containments and safety devices (e.g. safety showers, eyewash stations, cyanide kits and fire extinguishers).

PVDC has developed and implemented a Management of Change Procedure to evaluate changes to the cyanide facilities or cyanide activities. This procedure consists of completing a request for change, identifying the stakeholders, completing an asset risk checklist, review of the impact of the change, completion of a formal risk assessment, identifying pre- and post-implementation actions, filling out the management of change action log, obtaining approval for the change, communicating the change, closeout, and record keeping. The auditors reviewed nine management of change forms, signed by safety and environmental staff (among others), during the recertification period to verify compliance.

PVDC solicits worker input in developing and evaluating health and safety procedures described in their SOPs via: 1) direct communication between supervisors and operators; 2) meetings conducted at the process areas (such as daily meetings, monthly Safety and Security Subcommittee meetings, and refresher training); 3) the task observation program evaluations; and 4) use of the Anonymous Suggestion Sheets. Changes in SOPs and operating plans as well as cyanide safety topics are discussed as part of the daily meetings at the process areas.

Pueblo Viejo Mine
Name of Facility

Kat R. Jones
Signature of Lead Auditor

May 22, 2018
Date





ICMC RECERTIFICATION SUMMARY AUDIT REPORT

Standard of Practice 6.2: Operate and monitor cyanide facilities to protect worker health and safety and periodically evaluate the effectiveness of health and safety measures.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 6.2

not in compliance with

Summarize the basis for this finding/deficiencies identified:


The operation is in full compliance with Standard of Practice 6.2 requiring that the site operate and monitor cyanide facilities to protect worker health and safety and periodically evaluate the effectiveness of health and safety measures.

PVDC has determined the appropriate pH for limiting the evolution of HCN gas during unloading and production activities. Operating procedures recommend a pH of 11.5 for cyanide mixing solution, greater than 9.7 for the CIL and stripping circuits and of 9.0 for the detox circuit. PVDC monitors the pH with in-line pH meters and portable pH meters. In addition, PVDC samples the pH using a portable pH meter three times at each process circuit during each shift to ensure that it is being maintained at a high enough level to prevent the generation of HCN. PVDC also monitors HCN concentrations daily at different areas of the process plant using fixed HCN meters. Daily pH data recorded at the cyanide mixing and storage area, and the CIL, stripping and detox circuits were reviewed to verify that the pH was maintained as recommended.

PVDC has identified areas where workers may be exposed to cyanide through risk assessments in 2014. PVDC has installed fixed HCN monitors in these areas. No changes in process parameters have occurred since the previous certification audit and therefore the results of the risk assessments are still current. Fixed HCN monitors are located in the cyanide transfer station, at the cyanide mixing tank, the cyanide storage tank, CIL feed tank, CIL Tanks #1, 2, 5 and 6, Carbon Screens #1 and #2, Detox Tank #1 and Detox Tank #2. In addition, operators are required to wear handheld HCN meters to conduct work in the cyanide transfer station, the cyanide mixing and storage area, the CIL area, the stripping area, and the cyanide destruction area, as well as to conduct maintenance work and confined space related work. HCN alarms are set at 4.0 ppm (preventive) and 4.7 ppm (evacuation). A new data system has been implemented to better track and store HCN data and improve calibration of the HCN meters. With this new system, portable HCN are automatically calibrated when they are bump tested. Also, if an HCN meter alarm goes off, the system automatically alert via email to the supervisors.

Warning signs have been placed in areas where cyanide is used to alert workers that cyanide is present, that smoking, eating and drinking are prohibited and that the necessary cyanide-specific PPE must be worn.

Pueblo Viejo Mine
Name of Facility


Signature of Lead Auditor

May 22, 2018
Date



ICMC RECERTIFICATION SUMMARY AUDIT REPORT

Pipelines carrying cyanide are marked and the direction of flow is indicated with arrows on the pipe. Signage for confined spaces in tanks has also been placed.

Showers, low-pressure eye wash stations, and dry powder fire extinguishers are located at strategic locations throughout the operation and are maintained, inspected and tested on a regular basis. Showers and eyewash stations were operational. First aid procedures and Material Safety Data Sheets are available in the cyanide antidote kits, control room, cyanide transfer station and storage area at the reagents yard and in other main process areas where the cyanide is used. The instructions are in Spanish, the language of the workforce.

PVDC has implemented procedures that require incidents involving cyanide be investigated and evaluated to determine if its programs and procedures to protect worker health and safety and to respond to cyanide exposures are adequate or if changes are necessary.

Verification was conducted by the review of pH and HCN values recorded at the cyanide areas, calibration records of the fixed and portable HCN monitors, inspections records of the emergency safety showers and eyewash stations, completed incident investigation report, as well as by visual observation during the site visit.

Standard of Practice 6.3: Develop and implement emergency response plans and procedures to respond to worker exposure to cyanide.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 6.3


not in compliance with

Summarize the basis for this finding/deficiencies identified:

The operation is in full compliance with Standard of Practice 6.3 which requires that the site develop and implement emergency response plans and procedures to respond to worker exposure to cyanide.

PVDC has water, oxygen, cyanide antidote kits, automatic external defibrillator (AED), radio and telephone in the areas where cyanide is present and in the medical clinic. Cyanide antidote kits are located in the office of the reagents yard (one kit), the CIL office building (one kit), the CIL Tank #5 Laboratory (one kit), and the medical clinic (four kits). Cyanide antidote kits include Cyanokit (Hydroxocobalamin), oxygen, and AED. In addition, sodium thiosulfate, resuscitators and two ambulances are located in the medical clinic. The auditors confirmed that all antidote kits are stored at the correct temperature. Cyanide antidote kits located in the process areas are inspected monthly by emergency response personnel. The cyanide kits

Pueblo Viejo Mine
Name of Facility


Signature of Lead Auditor

May 22, 2018
Date



ICMC RECERTIFICATION SUMMARY AUDIT REPORT

located in the medical clinic are inspected daily. Inspections are documented and completed inspections forms were reviewed.


PVDC has its own onsite capability to provide first aid and medical assistance to workers exposed to cyanide. PVDC has an onsite medical clinic that is staffed with at least a doctor and a nurse per shift. In addition to the doctor, the nurses are qualified to provide medical/emergency assistance. Also, first responders are available per shift. The ambulances in the medical clinic will be used for transporting a patient to an outside medical facility, if required.

PVDC has developed a “Cyanide Management and Response Guideline” and a procedure for “Cyanide First Aid” that describe procedures for cyanide poisoning and first aid for cyanide. PVDC has also developed a procedure for “Cyanide Gas Response” which addresses different response scenarios in the case HCN gas is detected in the process areas. In addition, PVDC has developed a procedure for Medical Management for “Cyanide Intoxication” that includes response procedures for cyanide intoxication including cyanide antidote kit, intravenous administration, medical treatment in a hospital, and transport of a cyanide intoxicated worker to a local hospital.

PVDC has made a formalized arrangement with a local hospital, Centro Integral de Salud Maimon (CISAM), located in Maimon for further medical treatment related to cyanide exposure, if required. PVDC has trained the hospital staff in medical treatment for cyanide intoxication on October 21, 2017. The auditors reviewed records of the training received by the hospital staff and a copy of the letters sent by PVDC to this hospital in 2016 and 2017. The purpose of the letters was to inform the hospital of the use of cyanide at PVDC and verify that the hospital staff is qualified to treat a cyanide exposure patient.

PVDC conducts mock emergency drills annually based on likely cyanide release/exposure scenarios. The auditors reviewed reports on the mock drill conducted during the recertification period and in all cases the mock drills tested the response procedure, and incorporated lessons learned from the drills into its cyanide related response planning, when necessary.

Pueblo Viejo Mine
Name of Facility



Signature of Lead Auditor

May 22, 2018
Date



PRINCIPLE 7 – EMERGENCY RESPONSE

Protect Communities and the Environment through the Development of Emergency Response Strategies and Capabilities

Standard of Practice 7.1: Prepare detailed emergency response plans for potential cyanide releases.

[X] in full compliance with

The operation is

[] in substantial compliance with

Standard of Practice 7.1

[] not in compliance with

Summarize the basis for this finding/deficiencies identified:

The operation is in full compliance with Standard of Practice 7.1 which requires that the site prepare detailed emergency response plans for potential cyanide releases.

PVDC has developed plans and procedures that address emergency response to potential accidental releases of cyanide. PVDC plans contain procedures for potential scenarios such as: 1) cyanide intoxication; 2) accidents during cyanide transportation; 3) releases during unloading and mixing; 4) release of cyanide during fires and explosions; 5) pipe, valve or tank ruptures; 6) overtopping of ponds and impoundment; 7) electrical power outages and pump failures; 8) uncontrolled seepage; 9) catastrophic failure of the TSF; 10) failure of the cyanide destruction system; 11) cyanide spill control and clean-up; and 12) decontamination and emergency evacuation. The procedures address specific response actions for clearing site personnel from the area of exposure; use of cyanide antidotes and first aid measures for cyanide exposure; decontamination procedures; control of releases at their source and containment; evacuation of affected communities; as well as the assessment, mitigation and future prevention of releases. Verification was by review of these documents and interview with safety and process personnel.

Standard of Practice 7.2: Involve site personnel and stakeholders in the planning process.

[X] in full compliance with

The operation is

[] in substantial compliance with

Standard of Practice 7.2

[] not in compliance with

Summarize the basis for this finding/deficiencies identified:

The operation is in full compliance with Standard of Practice 7.2 which requires that the site involve site personnel and stakeholders in the planning process.

PVDC solicits the input of its workforce and local response agencies (e.g. local hospitals) in the emergency response planning through training sessions and mock drills. Worker input in developing and evaluating health and safety procedures is via direct communication between supervisors and operators and during





ICMC RECERTIFICATION SUMMARY AUDIT REPORT

training meetings. In addition, process personnel, onsite doctor and the Emergency Response Team (ERT) have participated in the cyanide-related mock drills conducted during the recertification period.

PVDC has made a formalized arrangement with a local hospital, CISAM, located in Maimon for further medical treatment related to cyanide exposure, if required. PVDC has trained the hospital staff in medical treatment for cyanide intoxication on October 21, 2017. The auditors reviewed records of the training received by the hospital staff. In addition, PVDC has provided training in cyanide management to doctors and nurses of other local hospitals in Cotui, Maimon and Piedra Blanca in 2017. Representatives of the local response entities such as the Police Departments, Red Cross, Fire Departments, and Civil Defense also attended this training. The auditors reviewed records of this training to verify compliance.

Accidental cyanide releases that could affect the communities would be from a cyanide transportation accident along the transportation route or a failure of the TSF. Therefore, the communities that could be affected are located along the transportation route (e.g., Piedra Blanca, Maimon, Tocoa, Las Lagunas and others) and downstream from the TSF (e.g., Arroyo Vuelta, and others). PVDC has provided training in the procedures described in the Community Emergency Action Plan (PV-G50008) to local communities in the area of influence of the mine, including the ones along the transportation route and the ones located downstream of the TSF. This training has been provided via annual cyanide training workshops. The auditors reviewed records and attendee lists for cyanide related workshops provided to the communities.

PVDC keeps a stakeholder contact information list in its emergency response procedures including local Police Departments, Red Cross, Fire Departments, hospitals, Civil Defense and leaders of the different communities.

Standard of Practice 7.3: Designate appropriate personnel and commit necessary equipment and resources for emergency response.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 7.3


not in compliance with

Summarize the basis for this finding/deficiencies identified:

The operation is in full compliance with Standard of Practice 7.3 which requires that the site designate appropriate personnel and commit necessary equipment and resources for emergency response.

PVDC has committed in their emergency response plans and procedures the necessary emergency response equipment and first aid to manage cyanide incidents at the operation and to coordinate

Pueblo Viejo Mine
Name of Facility


Signature of Lead Auditor

May 22, 2018
Date



transportation to local hospitals for further treatment if necessary. The Emergency Management and Response Guideline the responsibilities and level of authority of the emergency response coordinators.

PVDC has identified its ERT and emergency coordinators and has an updated list of them including their name and contact information in their different emergency response plans (e.g., Response to Cyanide Emergency Guide).

PVDC has emergency responders and doctors on-site to respond to a cyanide emergency. Emergency responders are trained in first aid, medical treatment related to cyanide, rescue in collapsed structures, Hazardous Waste Operator (HAZWOPER), emergency response equipment, confined space, hazmat truck use, firefighting, use and maintenance of self-contained breathing apparatus (SCBAs) and others. The auditors reviewed the ERT training program plan, the ERT training matrix and training records to verify compliance. All emergency response equipment and supplies are inspected on a regular basis (including antidote kits, ambulances in the medical clinic, hazmat truck including spill response equipment, rescue equipment, chemical protective suits, SCBAs and others).

PVDC has engaged in consultation with outside local entities (i.e., Civil Defense, Police Departments, Fire Departments, and Red Cross) and community representatives in terms of evacuation support, if required in case of an emergency. This has been conducted through training workshops. The Emergency Management and Response Guideline includes contact information of these local entities and the leaders of the communities. The Procedure for Medical Management for Cyanide Intoxication describes the role of the local hospitals in terms of medical treatment for cyanide intoxication.

Standard of Practice 7.4: Develop procedures for internal and external emergency notification and reporting.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 7.4


not in compliance with

Summarize the basis for this finding/deficiencies identified:

The operation is in full compliance with Standard of Practice 7.4 which requires that the site develop procedures for internal and external emergency notification and reporting.

The Community Emergency Action Plan and the Emergency Management and Response Guideline contains procedures to notify local communities, the media, PVDC management, government agencies and medical facilities, cyanide transporter and external response entities. Also, these plans included current contact telephone numbers for internal (i.e., PVDC management, ERT and emergency response

Pueblo Viejo Mine
Name of Facility


Signature of Lead Auditor

May 22, 2018
Date



ICMC RECERTIFICATION SUMMARY AUDIT REPORT

coordinators) and external emergency entities and community leaders (i.e., cyanide transporter, local hospitals and other local entities, and the media).

Standard of Practice 7.5: Incorporate in response plans and remediation measures monitoring elements that account for the additional hazards of using cyanide treatment chemicals.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 7.5

not in compliance with

Summarize the basis for this finding/deficiencies identified:

The operation is in full compliance with Standard of Practice 7.5 which requires that the site incorporate in response plans and remediation measures monitoring elements that account for the additional hazards of using cyanide treatment chemicals.

PVDC has developed spill response procedures describing specific remediation measures for cyanide releases. These procedures describe measures to address the management of contaminated soils (or contaminated media) and describe what final cyanide concentration will be allowed in residual soil as evidence that the release has been completely cleaned up. Soils samples would be taken following cleanup to confirm complete removal of all cyanide contaminated materials. Water samples would also be taken to confirm the extent of the spill, if necessary. PVDC has developed plans to sample and monitor soils and surface water and groundwater in the event of a cyanide spill. PVDC does not consider the use of treatment chemicals to remediate spills within or outside containment. Furthermore, PVDC does not consider the use of chemicals to treat cyanide that has been released into surface waters.

The water for the operation is supplied from the Hatillo Reservoir. From this reservoir, the water is pumped to the Hondo Reservoir located upgradient of the process facilities. In case of a release, the Hondo Reservoir would not be impacted. Water for the communities of El Naranjo, La Cerca, and Las Lagunas comes from collection points upgradient and to the east of the TSF, which also would not be impacted in the event of a release.

Standard of Practice 7.6: Periodically evaluate response procedures and capabilities and revise them as needed.

in full compliance with

The operation is


in substantial compliance with

Standard of Practice 7.6

not in compliance with

Summarize the basis for this finding/deficiencies identified:

Pueblo Viejo Mine
Name of Facility


Signature of Lead Auditor

May 22, 2018
Date




ICMC RECERTIFICATION SUMMARY AUDIT REPORT

The operation is in full compliance with Standard of Practice 7.6, which requires that the site periodically evaluate response procedures and capabilities and revise them as needed.

The cyanide related emergency response procedures and plans are reviewed and revised as needed at least every three years or when a situation arises that warrants a modification due to safety or environmental risks. The plans and procedures have a revision history table describing the revision number, the date of the revision and a description of the changes/modifications made to the document. The auditors reviewed the “Cyanide First Aid” Procedure and the “Cyanide Management and Response Guideline” to verify that these documents have been reviewed and revised during the recertification period.

Also, there are provisions in place to evaluate and revise emergency response procedures and plans following any cyanide-related emergency requiring implementation of the plans. For example, the “Emergency Management and Response Guideline” requires this document to be revised yearly as well as needed (e.g., following mock drills, actual incidents or changes in their response procedures). No corrective actions following mock drills have required an evaluation and revision of this plan. The auditors reviewed this plan to confirm that review procedures are in place and that in the case a revision of this plan is needed in the future following a mock drill or an accident, the revisions would take place as required. PVDC conducts mock drills annually based on likely cyanide release/exposure scenarios to test the response procedure, and incorporates lessons learned from the drills into its response planning. PVDC has conducted three cyanide mock drills during the recertification period. The auditors reviewed the mock drill reports, and in all cases, the mock drills tested the response procedure, and incorporated lessons learned from the drills into its response planning related to cyanide, when necessary. Debriefs were conducted to discuss lessons learned from the drills and corrective actions. For example, one of the action actions resulting from the 2016 mock drill was the modification of the spill response procedure to add ERT responsibility to support the area involved in the clean-up and the disposal of the spilled material. The procedure was modified in 2017 to address this action. Auditors reviewed the supporting documentation (RIMS database) to verify that action items identified for these mock drills have been accomplished. Records of the mock drills, debriefs, and training sessions were also reviewed to verify compliance.

Pueblo Viejo Mine
Name of Facility



Signature of Lead Auditor

May 22, 2018
Date



PRINCIPLE 8 – TRAINING

Train Workers and Emergency Response Personnel to Manage Cyanide in a Safe and Environmentally Protective Manner

Standard of Practice 8.1: Train workers to understand the hazards associated with cyanide use.

[X] in full compliance with

The operation is

[] in substantial compliance with

Standard of Practice 8.1

[] not in compliance with

Summarize the basis for this finding/deficiencies identified:

The operation is in full compliance with Standard of Practice 8.1 which requires that the site train workers to understand the hazards associated with cyanide use.

PVDC provides initial training as well as annual refresher training in cyanide hazard recognition to all employees and contractors. The training is provided in three different levels depending on the potential level of exposure of each employee. Training materials covers, as a minimum, the Code, cyanide physical properties, use of the cyanide in at the site, PPE, general emergency procedures in case of spills and exposures, and emergency communication requirements. PVDC retains all cyanide training records including test results demonstrating an understanding of the training. Verification was by interview with training personnel, random interviews to operators and review of employee training materials and records.

Standard of Practice 8.2: Train appropriate personnel to operate the facility according to systems and procedures that protect human health, the community and the environment.

[X] in full compliance with

The operation is

[] in substantial compliance with

Standard of Practice 8.2

[] not in compliance with

Summarize the basis for this finding/deficiencies identified:

The operation is in full compliance with Standard of Practice 8.2 which requires that the site train appropriate personnel to operate the facility according to systems and procedures that protect human health, the community and the environment.

All personnel in job positions that involve the use of cyanide and cyanide management (including unloading, mixing, transfer, transportation, production and maintenance) receive training on how to perform their assigned tasks with minimum risk to worker health and safety. Individual training is provided for each specific task an operator will perform related to cyanide management. Task-specific SOP training is provided prior to working with cyanide independently.

Pueblo Viejo Mine
Name of Facility

[Signature]
Signature of Lead Auditor

May 22, 2018
Date





ICMC RECERTIFICATION SUMMARY AUDIT REPORT

Training elements for each specific job are identified in the Employee Training Assessment Management System database. This new database is being implemented to track training requirements and training records per employee. A training score card can be generated by employee based on this database containing training requirements and training history. Verification was through review of task specific records and random interviews to cyanide operators to verify compliance.

Task specific training to operators is provided by various process supervisors who have several years of experience in the mine process. General training related to cyanide management is provided by Process Training Supervisors who are certified in Training and Assessment by Tafe Queensland, and also certified as Technical Training and Development Facilitators by the Professional Technical National Institute of the Dominican Republic.

All personnel in job positions that involve the use of cyanide and cyanide management receive training on how to perform their assigned tasks prior to working with cyanide. Individual training is provided for each cyanide-related task that an operator will perform. After receiving task specific training, the operator works with an experienced operator under the observation of the Area Supervisor and the Training Supervisor until the Area Supervisor considers that the employee is ready to work with cyanide independently. At that point, the new employee must pass an evaluation (STA). The Area Supervisor then confirms that the new employee is able to perform the task on their own by signing off the STA.

PVDC requires and provides refresher training on cyanide management annually (as part of Level 1 – 3 Training Program) and in task-specific SOPs on regular basis to ensure that employees continue to perform their jobs in a safe and environmentally protective manner. Refresher training in task-specific SOPs is provided by supervisors through daily meetings. PVDC requires written tests to evaluate the effectiveness of cyanide training and those training records are retained throughout an individual's employment, documenting the training received. The records include the name of the employee and the trainer, the date of training; the topics covered, and test results demonstrating an understanding of the training materials.

Standard of Practice 8.3: Train appropriate workers and personnel to respond to worker exposures and environmental releases of cyanide.

in full compliance with

The operation is

in substantial compliance with


Standard of Practice 8.3

not in compliance with

Summarize the basis for this finding/deficiencies identified:

The operation is in full compliance with Standard of Practice 8.3 which requires that the site train appropriate workers and personnel to respond to exposures and environmental releases of cyanide

Pueblo Viejo Mine
Name of Facility


Signature of Lead Auditor

May 22, 2018
Date



ICMC RECERTIFICATION SUMMARY AUDIT REPORT

Personnel responsible for cyanide unloading, transfer, transport processing and maintenance are trained in procedures to be followed if cyanide is released, as well as in decontamination and first aid procedures. This training is provided as part of the annual Level 3 cyanide training and the SOP related training. All process personnel are required to receive training in specific procedures for Cyanide Spill Response, Oxygen Administration in case of Cyanide Intoxication, and Decontamination. Level 3 cyanide training and the SOP related training cover cyanide conditions to be considered to control and respond to spills, HCN gas release, responsibilities of the employees, supervisors and the ERT, response actions in case of solid and liquid cyanide spills, decontamination, required PPE, and final disposal of contaminated soil, clean-up materials, oxygen administration, emergency communication, and others.


Emergency Response Coordinators and members of the ERT received training in the procedures described in the Emergency Management and Response Guideline in September 2015 during a specific training in PVDC Crisis Management Procedures.

PVDC has made local response agencies familiar with those elements of their cyanide emergency response plan related to cyanide through training sessions. PVDC has provided training in cyanide management to doctors and nurses of other local hospitals in Cotui, Maimon and Piedra Blanca in 2017. Representatives of the local response entities such as the Police Departments, Red Cross, Fire Departments, and Civil Defense also attended this training. In addition, PVDC has provided training in the procedures described in the Community Emergency Action Plan to local communities in the area of influence of the mine. This training has been provided via annual cyanide training workshops.

PVDC conducts cyanide-related mock drills based on release/exposure scenarios. Mock drills are evaluated from a training perspective to determine if personnel have knowledge and skills required for effective response.

PVDC provides refresher training for response to cyanide exposures and releases through the annual Level 3 Cyanide Refresher Training. Refresher training covers potential areas of cyanide exposures in the process areas, cyanide exposure to HCN gas, exposure routes, emergency response equipment, location of the fixed HCN monitors, cyanide antidote kits, response procedures in case of elevated levels of HCN gas and in case of spills, decontamination, fire and cyanide, location of the fixed HCN monitors and others. In addition, refresher training in cyanide exposures and releases is provided during daily safety meetings in the process areas. Training records are retained and include the names of the employee and the trainer, the date of training; the topics covered, and test results demonstrating an understanding of the training materials. Verification was through interview with training personnel and review of training records.

Pueblo Viejo Mine
Name of Facility


Signature of Lead Auditor

May 22, 2018
Date



PRINCIPLE 9 – DIALOGUE

Engage in Public Consultation and Disclosure

Standard of Practice 9.1: Provide stakeholders the opportunity to communicate issues of concern.

[X] in full compliance with

The operation is

[] in substantial compliance with

Standard of Practice 9.1

[] not in compliance with

Summarise the basis for this finding/deficiencies identified:

The operation is in full compliance with Standard of Practice 9.1 which requires that the site provide stakeholders the opportunity to communicate issues of concern.

PVDC provides opportunities for stakeholders to communicate issues of concern through community meetings, water quality monitoring events, site tours, training workshops and via the Barrick website. During these activities, stakeholders can pose questions and receive feedback.

Tours are conducted on a regular basis. Tours provide informative cyanide materials and describe cyanide use. Visitors are encouraged to ask questions or raise concerns, and personnel from the operation are available to address concerns or provide additional information.

PVDC has a community office located at the mine (by the main gate) that is open daily to the general public. Stakeholders can visit this office to obtain information about the mine, communicate their concerns, and request a site tour.

PVDC has implemented a Community Water Monitoring Program that includes surface water sampling at several points downstream of the operation in the Margajita River. Cyanide is analyzed as part of this monitoring. This monitoring program is conducted with the participation of 26 communities.

Additionally, Barrick maintains a website that allows stakeholders to contact the company regarding any concerns or issues (http://www.barrick.com/contact-us/default.aspx). This site provides a toll free phone number and an email address to contact Barrick Corporate Offices in Toronto, Canada.

Standard of Practice 9.2: Initiate dialogue describing cyanide management procedures and responsively address identified concerns.

[X] in full compliance with

The operation is

[] in substantial compliance with

Standard of Practice 9.2

[] not in compliance with

Pueblo Viejo Mine
Name of Facility

[Signature]
Signature of Lead Auditor

May 22, 2018
Date





Summarize the basis for this finding/deficiencies identified:

The operation is in full compliance with Standard of Practice 9.2 which requires that the site initiate dialogue describing cyanide management procedures and actively address identified concerns.

PVDC has created opportunities to interact with stakeholders and to provide them with information regarding cyanide management. These opportunities primarily consist of community meetings, water quality monitoring events, site tours, training workshops and via the Barrick website.

Tours are conducted on a regular basis. Tours provide informative cyanide materials and describe cyanide use. Visitors are encouraged to ask questions or raise concerns, and personnel from all aspects of the operations are made available to address concerns or provide additional information.

PVDC has a community office located at the mine (by the main gate) that is open daily to the general public. Stakeholders can visit this office to obtain information about the mine, communicate their concerns, and request a site tour.

PVDC has implemented a Community Water Monitoring Program that includes surface water sampling at several points downstream of the operation in the Margajita River. Cyanide is analyzed as part of this monitoring. This monitoring program is conducted with the participation of 26 communities.

Standard of Practice 9.3: Make appropriate operational and environmental information regarding cyanide available to stakeholders.

in full compliance with

The operation is

in substantial compliance with

Standard of Practice 9.3

not in compliance with


Summarize the basis for this finding/deficiencies identified:

The operation is in full compliance with Standard of Practice 9.3 which requires that the site make appropriate operational and environmental information regarding cyanide available to stakeholders.

PVDC has made operational and environmental information regarding cyanide available to stakeholders. PVDC has developed descriptions of how their activities are conducted and how cyanide is managed at the site. This information has been provided to communities in both written format (e.g., pamphlet and magazines) and oral form (i.e. presentations and videos) during visits to the communities and training workshops.

A pamphlet on “Myths and Realities, All you Need to Know about Cyanide” as well as the magazines on “What Do You Know About Cyanide” and “What Do You Know the Participatory Monitoring Program”, have

Pueblo Viejo Mine
Name of Facility


Signature of Lead Auditor

May 22, 2018
Date




ICMC RECERTIFICATION SUMMARY AUDIT REPORT

been distributed to workers and local communities. The pamphlet and magazines include information on cyanide management at PVDC, including how the extraction process of the gold is conducted using cyanide and environmental monitoring programs. PVDC has also provided a presentation and videos on the use of the cyanide at the mine as part of the site tours and the annual training workshops to the communities.

In addition, PVDC has published articles about cyanide management at the site in the Somos Barrick magazine and the Mercado magazine. These magazines are distributed to stakeholders, such as communities and government entities.

A cyanide-related exposure or release would be reported to regulatory agencies, as required by the PVDC Environmental License within the corresponding regulatory timeframe. Information on cyanide exposures and releases submitted to the regulatory agencies would be information available to the public. PVDC has not had any reportable cyanide-related release or exposure incidents during the recertification period.

Pueblo Viejo Mine
Name of Facility


Signature of Lead Auditor

May 22, 2018
Date



Report Signature Page

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Date: May 22, 2018

KJ/IA/rt

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Pueblo Viejo Mine
Name of Facility

Signature of Lead Auditor

May 22, 2018
Date

May 2018
Project No. 1783951

Established in 1960, Golder Associates is a global, employee-owned organization that helps clients find sustainable solutions to the challenges of finite resources, energy and water supply and management, waste management, urbanization, and climate change. We provide a wide range of independent consulting, design, and construction services in our specialist areas of earth, environment, and energy. By building strong relationships and meeting the needs of clients, our people have created one of the most trusted professional services organizations in the world.

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