



REPORT

Éléonore Gold Mine Cyanide Code Certification Summary Audit Report

Submitted to:

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Submitted by:

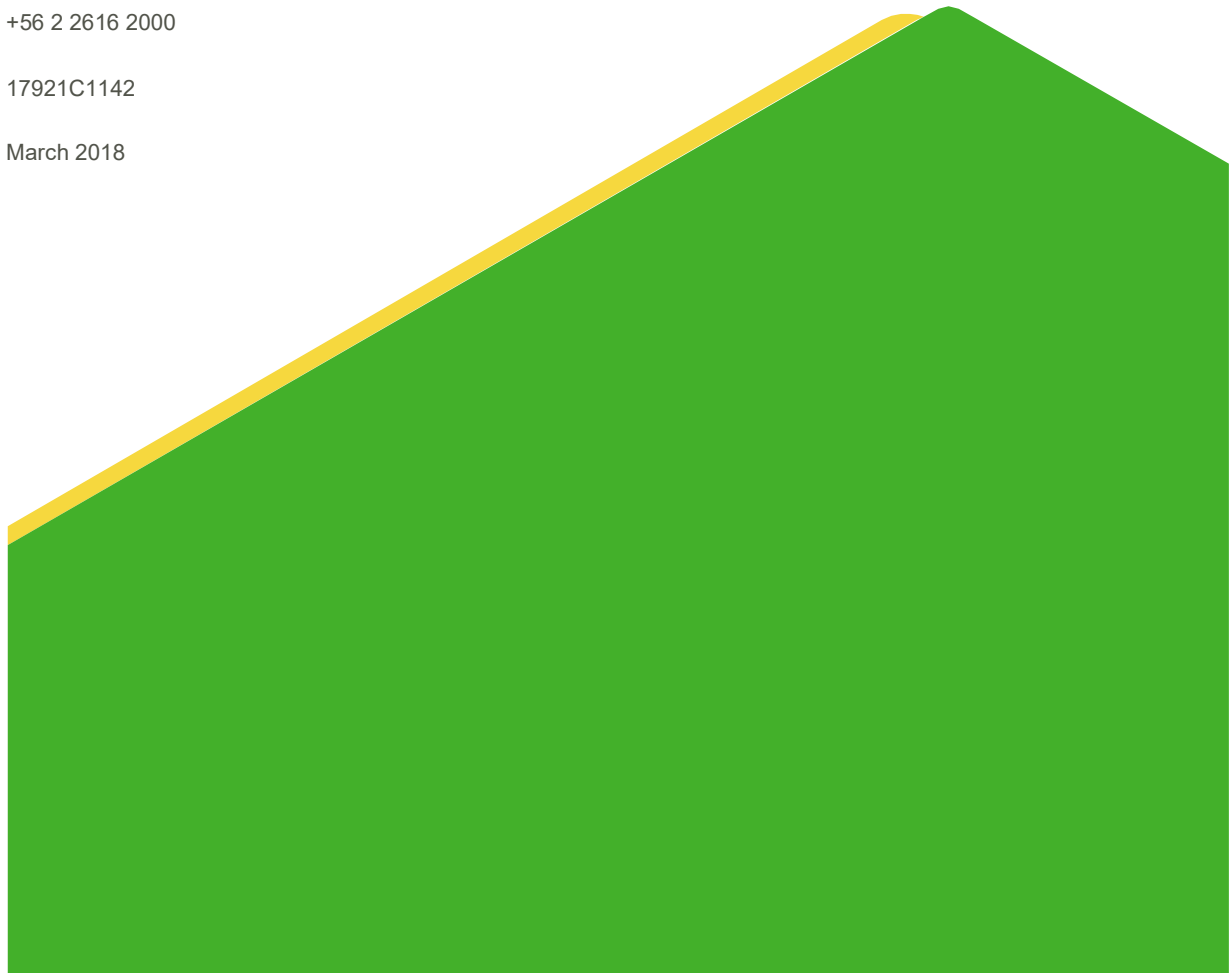
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Distribution List

Goldcorp

ICMI

Éléonore

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1.0 SUMMARY AUDIT REPORT FOR GOLD MINING OPERATIONS

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Name of Mine Owner:	Goldcorp Inc
Name of Mine Operator:	Mines D'Or Opinaca Ltée
Name of Responsible Manager:	Guy Belleau
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2.0 LOCATION DETAIL AND DESCRIPTION OF OPERATION

2.1 General

The Éléonore gold project is located in the mineral-rich James Bay region of Quebec, see Figure 1. Goldcorp owns the project through its subsidiary Les Mines Opinaca.

The project was developed over more than 10 years and is expected to have a mine life of 15 years. The first gold from the Éléonore mine was poured in October 2014 and commercial production began in April 2015.

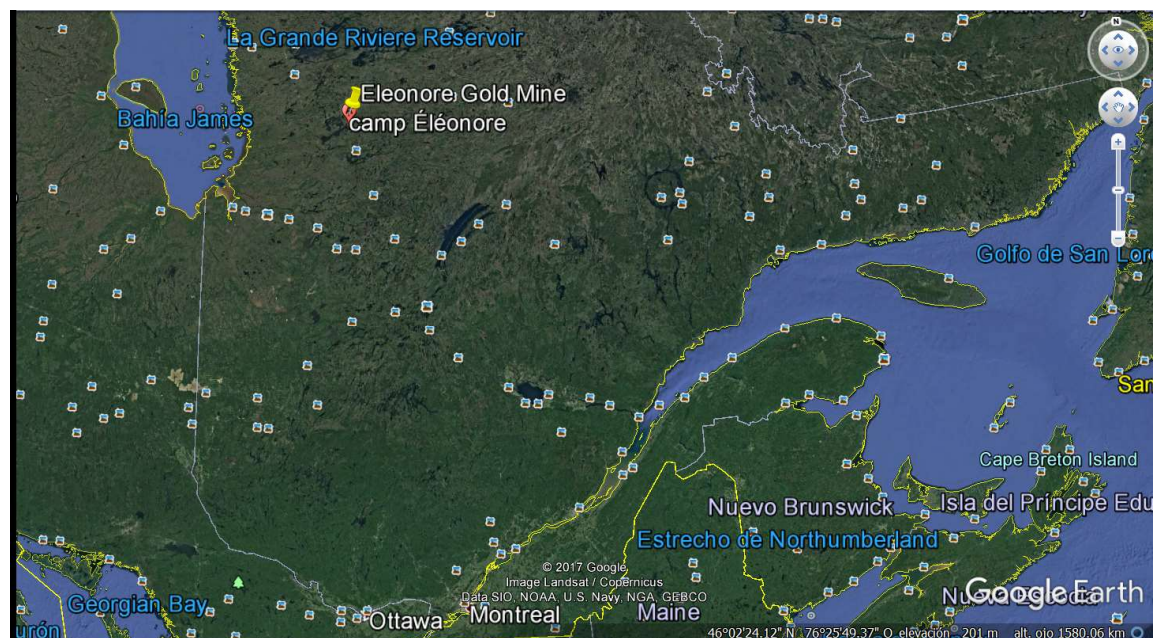


Figure 1: Regional Location Map

A combination of open-stoping and longitudinal retreat stoping methods is employed for the underground mining at Éléonore. The mining plan includes initial production from the upper portions of the Roberto deposit using the Gaumond / ventilation shaft. Deeper gold resources will be accessed by a production shaft running as deep as 1,500m below the surface, starting from 2018.

Using 55t trucks, ore is hauled to the loading stations located at 650m-deep before being transported to the surface via the Gaumond / ventilation shaft.

2.2 Processing of ore at Éléonore gold mine

The operation also includes a 3,500 tonnes per day (tpd) processing plant. The process flowsheet is presented Figure 2 while the concentrator floor plan is presented Figure 3.

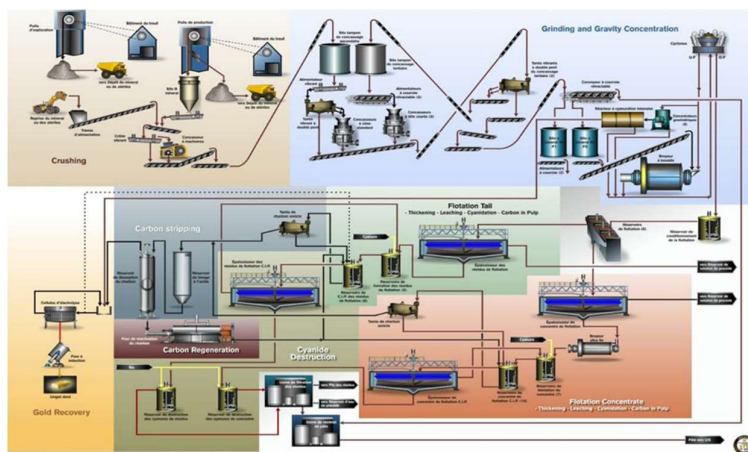


Figure 2: Process Flow Sheet

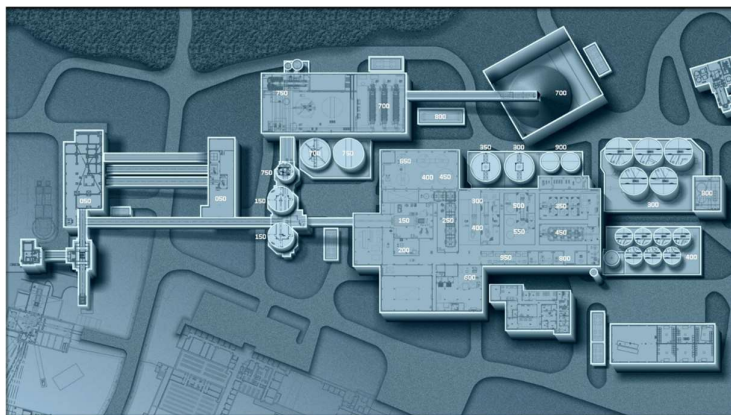


Figure 3: Plant Layout with Area Designations

2.2.1 Crushing Circuit (050)

The ore and waste materials coming from the underground mine is hoisted up the surface through a production shaft house located near the process plant.

2.2.2 Grinding Circuit (150)

The ore stored in the fine ore bin is reclaimed via two (2) variable speed belt feeders and fed at a controlled feed rate into a single ball mill operating in closed circuit with a cluster of hydrocyclones for classification. The cyclone overflow at P_{80} of 65 μm is sent to the flotation circuit. The underflow is recycled to the ball mill for further grinding.

2.2.3 Gravity Concentrator and Intensive Cyanidation (200)

A portion of the ball mill cyclone underflow is treated in a gravity concentration circuit to recover liberated gold. A vibrating scalping screen removes coarse solids and ball scats. The screen undersize feeds a gravity centrifugal concentrator. The tailings from the gravity concentrator and the scalping screen oversize gravitate to the gravity concentrator tails pump box from where it is pumped to the cyclone feed pump box. The concentrate is flushed periodically to the intensive leaching circuit located underneath the hydrocyclone cluster.

The gravity concentrate is accumulated for 1 day and is processed in batches using an intensive cyanidation dissolution module. The dissolved gold in solution is pumped to a gravity pregnant solution tank situated in the gold room for subsequent electrolytic recovery of solution gold in the same electrowinning cell used for the stripping of the carbon from the CIP circuits. The gold sludge is periodically recovered and is smelted to doré bars. The rejects of the intensive leaching circuit are flushed to the grinding circuit pump box.

2.2.4 Flotation (250)

The overflow slurry from the hydrocyclones flows by gravity over a linear trash screen to remove wood pieces, plastic and other small trash material which would plug the carbon screens in the CIP circuits. It then enters the mechanically-agitated conditioning tank where it is conditioned with xanthate collector and dithiophosphate promoter. The slurry from the conditioner overflows to a single bank of six (6) rougher flotation cells in series. The flotation cells are 130 m^3 in size. Frother is added at the flotation feed box.

The sulphide concentrate (approximately 10% weight recovery) is pumped to the flotation concentrate cyanidation circuit using froth pumps (1 operating and 1 standby) while the flotation tailing is pumped to the flotation tail cyanidation circuit using horizontal slurry pumps (3 pumps with either one or two pumps in operation depending on tonnage and the remaining pump(s) on standby).

2.2.5 Leaching Circuits (300, 350, 400 and 450)

2.2.5.1 Flotation Tails Leaching and Carbon in Pulp (CIP) Circuit

From the flotation circuit, the flotation tailing is pumped to the flotation tails high-rate thickener to thicken the slurry to 59% solids. The thickener overflow water is recycled to the process water tank for reuse and the thickener underflow is pumped to the flotation tails leaching circuit. There are five (5) leach tanks operating in series.

Process water is added to adjust the leach feed slurry density to 45% solids. Dilute cyanide solution is added to the feed slurry to dissolve gold and silver. Slaked lime is added to adjust the slurry pH to about 10.5 to prevent HCN gas formation as a safety precaution. Cyanide is added to the first and third leaching

tank and the cyanide addition rate is controlled with a cyanide analyzer. Cyanide concentration in the slurry is maintained at 0.5 g/L NaCN. The flotation tails leaching train has a total retention time of 36 hours. The slurry flows by gravity to each tank in steps of 600 mm. Each tank is equipped with an agitator to maintain the solids in suspension and air is injected for gold dissolution. Interconnecting tank launders are arranged so that any tank in series can be bypassed without the whole plant having to shut down.

After the leaching process, the slurry is transferred to the tails CIP circuit. The dissolved gold is adsorbed onto carbon in a *Kemix* AAC pump cell system. The adsorption circuit has 6 tanks of 120 m³ each in series with 15 minutes retention time each and contains a total of 36 tonnes of carbon. The pump cell mechanism combines the functions of agitation, inter-stage screening and slurry transfer in one unit. The suspension of the carbon and slurry mixture is maintained by the hydrofoil mixer. A unique rotating cage sets up a pulse and sweeping action around the screen, which keeps carbon off the screen and reduces the possibility of carbon or grit pegging in the screen apertures. This in turn ensures that pulp flowrate through the screen is maintained. The pumping action of the inter-stage screen generates a head differential and the contactors can be placed at the same level. With the contactors being at the same level it becomes relatively simple to provide common feed and tailings launders to allow the plant to operate in a carousel mode.

The tanks are fed by a launder which, via a series of plug and gate valves, allows the feed slurry to be diverted to the different head tanks. When the carbon in a head tank has reached the required gold on carbon loading, this tank is isolated from the adsorption sequence and the loaded carbon is separated from the slurry by pumping the entire content of the tank over a vibrating screen to recover the carbon for the elution circuit. The screened slurry flows back to join the adsorption circuit feed.

After the adsorption circuit, the flotation tails stream is pumped to the flotation tails CIP thickener for cyanide solution recovery. The thickener is preceded by a vibrating carbon safety screen to recover residual carbon that escaped from the inter-stage carbon screens. The thickener overflow is recycled to the leach feed as dilution water while the underflow is sent to the flotation tails cyanide destruction system.

2.2.5.2 Flotation Concentrate Leaching and CIP Circuit

The flotation concentrate is pumped to the flotation concentrate high-rate thickener where it is thickened to 55% solids. The thickener overflow water is recycled to the process water tank for reuse and the thickener underflow is pumped using hose pump to the IsaMill feed pump box for ultra-fine grinding.

The IsaMill is fed with the flotation concentrate thickener underflow and grinding media are added as required in the IsaMill feed pump box. The flotation concentrate is reground to about P₈₀ of 13µm before being discharged into a second pump box where dilution water recycled from the concentrate CIP thickener overflow and process water are added to reduce the leach feed density to 30% solids. The IsaMill product is then pumped to the first of two pre-aeration tanks to pre-condition the slurry for leaching. The IsaMill will operate in open circuit (no cyclone classification). The second pre-aeration tank feeds the first of five flotation concentrate leaching tanks.

The pH in cyanidation is maintained at approximately 10.5 as a safety precaution to prevent HCN gas formation. Lead nitrate is added to both pre-aeration and leach to reduce the sulphides activity, thereby limiting SCN⁻ formation which is detrimental to the cyanide destruction process downstream. Cyanide is also added to the first and third leaching tank and the cyanide addition is controlled with a cyanide analyzer. Cyanide concentration in the slurry is maintained at 1.5 g/L NaCN. The flotation concentrate leaching train has a total retention time of 48 hours. The slurry flows by gravity to each tank in steps of 400 mm. Each tank is equipped with an agitator to maintain the solids in suspension and oxygen, instead of air, is

injected to promote gold dissolution rate. Interconnecting tank launders are arranged so that any tank in series can be bypassed without the whole plant having to shut down.

After leaching, the slurry is transferred by gravity to the concentrate CIP circuit. The gold is adsorbed onto carbon in a *Kemix* AAC pump cell system. In order to achieve the high gold loading on carbon and due to solution concentrations, the concentrate CIP system has been designed to have a 30 minute contact time in each pump cell tank. The gold loading on carbon is expected to be as high as 25 kg/t of carbon. The adsorption circuit has ten (10) 30 m³ tanks in series for a total of 15 tonnes of carbon. The tanks are fed by a launder which, via a series of plug and gate valves, allows the feed slurry to be diverted to the different head tanks. When the carbon in a head tank has reached the required gold on carbon loading, this tank is isolated from the adsorption sequence and the loaded carbon is separated from the slurry by pumping the entire content of that tank over a vibrating screen to recover the carbon for the elution circuit. The screened slurry flows back to join the adsorption circuit feed. The design carbon concentration in the adsorption tanks is 50 g/l which is slightly above the normal pump cell operating range of 30- 60 g/l for a total of 1.5 tonnes of carbon per tank.

After the adsorption circuit, the flotation concentrate stream is pumped to the concentrate CIP high-rate thickener preceded by a vibrating carbon safety screen. The thickener overflow is recycled to the flotation concentrate leach feed for dilution and the thickener underflow is directed to the cyanide destruction system.

2.2.6 Carbon Elution Circuit (500)

The loaded carbon recovered from the two CIP adsorption circuits (Flotation Concentrate and Flotation Tails) is pumped from the loaded carbon surge tanks to the acid wash vessel with a capacity of 6 tonnes of carbon for loaded carbon. A dilute solution of 2% nitric acid is pumped into the acid washing vessel from the bottom and returns to the dilute acid tank while the pH is monitored. After the acid wash cycle is completed, the spent acid is neutralized by adding caustic, drained and pumped to the tailings pump box for disposal. An exhaust fan is connected to the acid wash pump box and the acid wash vessel and is used to remove fumes. After the acid wash treatment, the carbon is rinsed with water. The carbon is then rinsed again with a small amount of caustic to ensure neutralization. The carbon is then pumped to the carbon stripping vessels.

In the stripping vessels (6 tonne of capacity each), the gold is desorbed from the carbon by circulating a caustic-cyanide strip solution at high temperature (143 °C) and pressure (550 kPa) using the Zadra stripping process. The gold loaded strip solution, also called pregnant solution, is cooled with heat exchangers to about 88°C and pumped to the electrowinning cells. Reagents (caustic and cyanide) are added as needed to the strip solution to have the correct chemistry and conductivity for the carbon stripping. At the end of the elution cycle, the carbon is rinsed with fresh water and pumped to the carbon reactivation system.

2.2.7 Electrowinning and Refining (600)

The gold loaded strip solution, also called pregnant solution, is cooled with heat exchangers to about 88°C and pumped to the electrowinning cells. Each elution circuit (Flotation Concentrate and Flotation Tails) has its own electrowinning circuit to feed. The pregnant solution is pumped into series of two (2) electrowinning cells in each circuit. The gold in solution precipitates and adheres to the cathode which is made of woven mesh stainless steel. The barren solution goes to the barren solution tank via the cell discharge pump box and pumped back to the elution vessel passing thru the in-line heater and heat exchangers for re-heating to 143 °C.

The electrowinning in the gold room is done with two (2) electrowinning cells per circuit. Additionally, a separate electrowinning cell is used to recover the gold in the pregnant solution from the gravity intensive cyanidation system. There are 5 cells in total.

The loaded stainless steel cathodes and the sludge accumulated at the bottom of the cell are cleaned in a cathode washing tank with a high-pressure washer. The sludge collected at the bottom of the washing tank is discharged in trays and dried in the drying oven, and the overflow from the cathode washing tank is directed into the cathode wash pump box ahead of a sludge pump feeding a recessed plate filter for filtration. The filtered solids are discharged from the plate filter in trays and dried in the drying oven. The dry solids are cooled and mixed with an appropriate amount of flux and refined. The refining furnace provided is an induction furnace. Refined gold is poured to a series of moulds and the slag is poured into slag moulds

2.2.8 Carbon Regeneration (550)

After stripping, the carbon slurry pumped from the stripping column feeds a dewatering screen ahead of the reactivation kiln. The water used to pump the carbon slurry to the screen drains to the quench tank. The dewatered carbon from the screen is stored in an 8 tonne capacity feed bin in front of the kiln which ensures a steady feed during kiln operation. A steam-rich atmosphere is maintained in the kiln to prevent the carbon from charring. The carbon discharges from the kiln into a quench tank filled with water to simultaneously cool and wet the carbon. The kiln is electrical-fired and has a regeneration capacity of 8 tonnes per day. The reactivated carbon batch is pumped to the pump cell systems after the carbon extraction in the pump cell is completed. Fresh carbon required to make up for losses of fine carbon must be conditioned prior to use to remove fines, sharp edges and to thoroughly wet the particles. This is achieved in an attrition tank.

2.2.9 Cyanide Destruction, Tailings Thickening and Filtration (650 and 700)

Separate cyanide destruction systems are required for the flotation concentrate stream and the flotation tails stream. The flotation tails CIP circuit tailings will be used as paste backfill to the underground mine.

The selected cyanide destruction system is SO_2/O_2 method. The thickened slurries from their respective CIP thickeners are pumped to their respective cyanide destruction tank where process water is added to adjust the slurry density to the operating level. The systems use SO_2 to destroy the cyanide and oxygen is sparged into the tanks. Copper sulphate is added as needed to catalyze the cyanide destruction reaction and has been incorporated into the design. The target CN_{WAD} content at the output of the destruction system is < 1 ppm. After the cyanide destruction process, the tails streams are pumped to their respective thickeners

2.2.10 Reagents (800)

There are five (5) main process areas in the plant where reagents are used:

- Gravity intensive cyanidation area (Area 200);
- Flotation area (Area 250);
- Cyanidation areas (Areas 300, 400, 500 & 600);
- • Dewatering (Area 300, 350, 400, 450 & 700);
- Cyanide destruction (Area 650). Safety showers are provided in different reagent mixing areas for the safety of the operators, in case of contact with the reagents. The reagents used and their systems are described in the section below and consumption quantities provided are for operation at 7,000 t/d.

2.2.10.1 Cyanidation Area Reagents

The cyanidation process requires many reagents. The leaching portion of the gold extraction requires lime, cyanide and lead nitrate. The gold adsorption is later done on carbon which is fouling slowly and must be replaced. After the gold is adsorbed onto the carbon, it must be stripped from it. This operation starts with an acid wash of the carbon. Then, a high cyanide and caustic solution at high temperature is used to strip the gold from the carbon. Finally, the electrowinning sludge recovered is dried and mixed with fluxes for smelting.

Quick lime is delivered in bulk trucks in solid form and is stored in an onsite silo. The lime is extracted as required and slaked in a lime slaker to a slurry density of approximately 15% solids. From the lime slaker, the lime is stored in an agitated distribution tank and is circulated through a distribution loop from which it is metered into the cyanidation tanks to obtain the required pH.

Bulk cyanide is supplied in briquette form and delivered in ISO road tankers. Each truck has a capacity of 16.3 tonnes (16,300 kgs), from which a 'dilution sparging' system will be employed that will prepare a solution, 25% by weight of cyanide. This system will be able to dissolve cyanide from the ISO container and be fed directly to the required points at this concentration from a pressurized distribution header. The dosage of cyanide into the cyanidation tanks is controlled with a cyanide analyzer to ensure that the required amount is used as this is a major cost item in the operation and it needs to be destroyed at the end of the leaching circuit before storage of residues in the tailings pond.

The carbon stripping is done with a solution made of caustic and cyanide. The caustic is used to insure a good conductivity of the solution during electrowinning. It is also used to neutralize the acid solution in the acid wash cycle. The caustic solution will be supplied in bulk tankers in a 50% solution concentration and will be stored on site in a heated storage tank at 20% solution concentration.

3.0 CYANIDE INCIDENTS

Eleonore has had no reportable cyanide incidents during the initial certification period.

SUMMARY AUDIT REPORT

Auditors Findings

This operation is:

☒ in full compliance with

☐ in substantial compliance with

☐ not in compliance with


The International Cyanide Management Code.

Audit Company: Golder Associates

Audit Team Leader: Alistair Cadden, Lead Auditor and Technical Specialist

Email: acadden@golder.com

Name and Signatures of Other Auditors

Name	Position
Romain Girard	Auditor, Gold Mining Technical Specialist 

Dates of Audit

The Recertification Audit was carried out during 4 days, between the 18th and the 21st of September of 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 Verification Protocol for Mining Operations and using standard and accepted practices for health, safety and environmental audits.



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

Summarise the basis for this Finding/Deficiencies Identified:

The operation is in full compliance with 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.

Éléonore receives its cyanide from the Chemours Company, which was recertified as fully compliant with the code on 16th September 2016. Éléonore's sodium cyanide contract requires that the supplier is fully certified in accordance with the Code. The plant has been continuously compliant with the Code since 3rd November 2005, as published on the ICMI website. Éléonore does not receive any cyanide from an independent distributor.

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.

☒ in full compliance with

The operation is

☐ in substantial compliance with

Standard of Practice 2.1

☐ not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The operation is in full compliance with 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.

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

☒ in full compliance with

The operation is

☐ in substantial compliance with

Standard of Practice 2.2

☐ not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

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

Éléonore's cyanide supply contract with Chemours covers all aspects of manufacture and transport of cyanide. Chemours is responsible for the cyanide from its plant in Memphis, Tennessee until the isocontainers are parked in the cyanide storage building. Clause 13 (B) of the contract deals with the points raised in this question:

- a) Packaging as required by the United Nations for international shipments and by the political jurisdiction(s) the shipment will pass through.
- b) Labelling in languages necessary to identify the material in the political jurisdiction(s) the shipment will pass through, and as required by these jurisdiction(s) and by the United Nations (for international shipments).
- c) Storage prior to shipment.
- d) Evaluation and selection of routes, including community involvement.
- e) Storage and security at ports of entry.
- f) Interim loading, storage and unloading during shipment.
- g) Transport to the operation.
- h) Unloading at the operation.

- i) Safety and maintenance of the means of transportation (e.g. aircraft, vessels, trains, etc.) throughout transport.
- j) Task and safety training for transporters and handlers throughout transport.
- k) Security throughout transport.
- l) Emergency response throughout transport.

Clauses 13 (A) and (D) of Éléonore's cyanide supply contract with Chemours stipulate that designated responsibilities extend to all parties in the cyanide supply chain. Chemours cyanide supply chain from the production plant in Memphis, Tennessee to Éléonore is certified as fully compliant with the Code, as shown on the ICMI website:

- Chemours US/Canada Rail & Barge Supply Chain recertification summary audit report, August 18, 2017
- Chemours Canada cyanide supply chain recertification summary audit report August 11 2016

Éléonore maintains Bills of Lading showing that only the transporters certified under the Code as part of Chemours' supply chain from the plant in Tennessee are used to transport cyanide to the site.

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.

☒ in full compliance with

The operation is

☐ in substantial compliance with

Standard of Practice 3.1

☐ not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The operation is in full compliance with 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.

Facilities for unloading, storing and mixing cyanide have been designed and constructed in accordance with cyanide producers' guidelines, applicable jurisdictional rules and sound and accepted engineering practices for these facilities. The entire plant, including buildings and process equipment, has been designed by the engineering firm SNC Lavalin, who also supervised the construction of the facilities. The facilities were built during the period 2013-2014 by the construction company Talbon.

Unloading and storage areas for liquid and solid cyanide are located as far away as reasonably practicable from people and surface waters. The storage of the cyanide at the Éléonore plant is in a warehouse and the reagent area is located in a separate close-by building, and part of the concentrator area. The two buildings are about 100 m apart. ISO tanks of cyanide are transported one at a time from the warehouse to the reagent area. No liquid cyanide is delivered to Éléonore. Éléonore only receives solid sodium cyanide briquettes in ISO tanks. The area where mixing of the cyanide is undertaken has been designed and constructed to both contain and recover leakage from the ISO tanks.

Cyanide mixing and holding tanks are fitted with level indicators and high-level alarms to prevent the overfilling. Cyanide mixing and holding tanks are located on a surface that can prevent seepage to the subsurface. All floors are concrete, there are no cracks, and the reagent area is equipped with a sump and a sump pump preventing any potential spill to flow outside the building. Any spillage would be pumped back to the cyanide mix tank. Secondary containments for cyanide storage and mixing tanks are constructed of materials that provide a competent barrier to leakage.

Cyanide is stored in the warehouse with adequate ventilation to prevent the build-up of HCN gas. The warehouse has a roof and walls as well as concrete flooring. It is in a secure area where public access is prohibited, there are two doors that are locked at all times and accessed by badge by authorized personnel only. There are no other materials or chemicals stored in the cyanide warehouse building.

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

Summarise the basis for this Finding/Deficiencies Identified:

The operation is in full compliance with 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.

The empty cyanide containers are prevented from being used for any purpose other than holding cyanide as the empty ISO tanks are transported back to the warehouse and safely stored there. The ISO tanks are then returned to the vendor leaving site with the truck coming for the next delivery.

There are a number of procedures, checklists, as well as work instructions related to the activities of cyanide unloading, transfer from warehouse to reagent area, mixing and distribution, as well as transfer and storage in the warehouse. The operation of valves and couplings is described in the checklist for mixing and distribution as well as in the cyanide solution preparation work instruction. The handling of the cyanide containers (ISO tanks) is described in three different work instructions. Since the cyanide is delivered as ISO tanks, there is no possibility of stacking up any cyanide containers. There are 5 bays available for the ISO containers in the warehouse, and there can be only one ISO container at a time in the reagent area.

A full set of personal protective equipment (PPE), including full masks, gloves, boots and disposable clothing is detailed in the cyanide mixing procedure.

Mixing takes place with two operators (one mixing, one observing) in the reagent area. All operators and control room staff communicate with radios. Clean up operation prior and after mixing are also documented in the procedure and their implementation was observed by the auditors during the site visit and ensure timely clean-up of any spill during the mixing as well as cleaning of any potential residual cyanide residue from the ISO tanks.

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.

☒ in full compliance with

The operation is

☐ in substantial compliance with

Standard of Practice 4.1

☐ not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The operation is in full compliance with 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.

There is a full set of complete and comprehensive procedures covering solid cyanide storage, reagent area (800), Leaching (300 and 400), CIP (350 and 450), acid wash, elution, carbon stripping and carbon regeneration (500 and 550), acacia plant (250), cyanide destruction (650), backfill plant (700), as well as the management of process water in the plant. There are procedures as well for the area outside the plant such as the water treatment plant (UTEI) and its associated water storage pond and the tailings management facility (PAR) and its associated ponds.

The plant design criteria have been summarized into an operating spreadsheet by Goldcorp (Operational criteria, "Consignes d'opération"), which details for every circuit and every piece of equipment in the process plant (where relevant) the operational parameters under which that particular equipment should function under.

The cyanide facilities within the plant (warehouse, mixing, CIL circuit and gold recovery circuit) as well as outside the plant (UTEI, PAR) are inspected at every shift (operational inspection).

The operation inspects cyanide facilities on an established frequency sufficient to assure and document that they are functioning within design parameters.

Éléonore has a calendar-based preventive maintenance programme, whereby maintenance is planned on a yearly basis and tracked with SAP programme, and based broadly on recommendations from manufacturers. Every major piece of equipment (including cyanide equipment) for all plant and cyanide facilities (inside and outside the plant buildings) has a preventive maintenance programme that is entered within SAP. In addition, the entire inspection schedule is also entered in SAP, and therefore, weekly, monthly, quarterly inspection (depending on the facility and the type of inspection) are also subject to work orders.

The PAR operating manuals describe in detail the water management procedure for the operation of the facility- discharge criteria, pumps capacity and freeboard criteria, and the PAR, UTEI have also a regular schedule of preventative maintenance and regular inspections

At Éléonore the change management is managed through a number of procedures. For major capital investments it is related to the budget approval procedure (AFE). The AFE documentation requires an assessment of the change required and its justification in terms of health and safety, and environmental performance, as well as productivity.

Éléonore has a cyanide management contingency procedure for situations when:

- a) There is a change in a facility's water balance;
- b) Inspections and monitoring identify a deviation from design or standard operating procedures; and
- c) A temporary closure or cessation of the facility may be necessary.

The mill inspection for cyanide facilities is done at each shift (operational inspection) and on a weekly basis for each plant area by the area foreman. The inspection of the cyanide reagent area is undertaken at every mixing (about one every two days) and on a weekly basis. In addition to this there are inspection undertaken on a regular basis that are specific to the actual equipment to be inspected and/or maintained. The inspection of the tank holding cyanide solutions are being done during the operational shift inspection as well as during the weekly area inspection. The secondary containment are inspected during the operational shift inspection, and during the bi annual inspection, and any deficiency noted and addressed. Leak detection and containment system, as well as pipelines, pumps and valves are inspected during the shift inspection, and any of their equipment is part of the preventative maintenance program in line with the manufacturers' recommendation. All ponds and impoundments are also inspected during every shift, during the weekly inspection, as well as the yearly inspection and their levels recorded. Inspections are documented and the records maintained include the date of inspection, the inspector's name, any deficiencies observed, and any corrective actions.

There is an emergency response plan on site that allow to maintain all the process equipment running in case of power failure up to 600 V, but an order of priority has been given to all equipment in order to ensure the most critical equipment (Health and safety, production) is prioritised. The generators are part of the preventative maintenance programme and as such are being inspected on a regular suitable basis

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

Summarise the basis for this Finding/Deficiencies Identified:

The operation is in full compliance with Standard of Practice 4.2; introduce management and operating systems to minimise cyanide use, thereby limiting concentrations of cyanide in mill tailings.

The operation conducts a program to determine appropriate cyanide addition rates in the mill and evaluates and adjusts addition rates as necessary when ore types or processing practice require it. The mill is operating with defined cyanide addition design rates for each addition point. The rates have been determined through metallurgical testing.

The operation has evaluated various control strategies for cyanide additions.

The operation has implemented a strategy to control cyanide addition. Cyanide addition is controlled with titration tests that are undertaken at regular intervals.

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

Summarise the basis for this Finding/Deficiencies Identified:

The operation is in full compliance with Standard of Practice 4.3; implement a comprehensive water management programme to protect against unintentional releases.

Éléonore has developed a comprehensive water balance that has been developed to forecast tailing deposition. The water balance is based on monthly evaluations. Parameters such as tailings deposition rates, precipitation, evaporation and seepage rates, run off, impacts of freezing and thawing, water discharge capacity, vary accordingly.

The data for tailings solids and water are issued by the concentrating plant. The design storm events, as calculated by the designer used data from a meteorological station close to the mine. There is provision in the PAR, and collection pond design for storm events. The water balance takes into account precipitation that occurs as snow, and thawing in the spring months based on weather station data.

Operating procedures include inspection and monitoring activities to implement the water balance and prevent overtopping of ponds, impoundments and unplanned discharge of cyanide solutions to the environment. There is a monthly reconciliation on pond level and water balance data, as well as an annual aerial survey of the area.

The design values for freeboard are stated in the OMS manual, and regular level checks are undertaken. Inspections record water level in ponds. Éléonore measures precipitation, and data is incorporated in the water balance as real data and reconciliation is undertaken on the water balance on a regular basis, when the water balance is updated following operational changes.

It is to be noted that the PAR design includes a basal geomembrane, and is a facility where residues are being stored as dry stacks, which means the inflows and variation of water are extremely limited.

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

Summarise the basis for this Finding/Deficiencies Identified:

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

Éléonore does not operate any heap leaching facilities. Open water bodies are well below 50 mg/L WAD cyanide. The sampling procedure includes inspection for wildlife mortality; There are no records of wildlife mortality due to cyanide in open water on site.

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

Summarise the basis for this Finding/Deficiencies Identified:

The operation is in full compliance with Standard of Practice 4.5; implement a comprehensive water management programme to protect against unintentional releases.

There is one compliance point before to direct discharge into Surface water at the discharge of the UTEI. The point is called "regard 6". The water then goes into the Opinaca reservoir, where the mixing zone and the compliance point after mixing is located.

The data from the Regard 6 compliance point were reviewed and the WAD cyanide concentration was found to be less than 0.5 mg/L.

The mixing zone is located at the Opinaca reservoir, where measurement are being taken at the point of compliance twice a year, with three sampling points on Surface, and three sampling points at depth.

The analytical data for these compliance point were reviewed for 2017 (two measurements for each point) and all data were below the 0,022mg/L Free cyanide. The maximum recorded value was 0,008mg/L.

Éléonore does not have an indirect discharge to surface water, as all the industrial water is collected and sent to the UTEI. No direct or indirect discharges from the operation have caused cyanide concentration in surface water to rise above levels protective of a designated beneficial use for aquatic life, therefore there is no need for the operation to engage in remedial activity to prevent further degradation.

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

Summarise the basis for this Finding/Deficiencies Identified:

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

Ponds that may contain cyanide are designed with a membrane system.

There are 28 groundwater monitoring wells downgradient of the operation that are used to assess if cyanide levels would appear in groundwater, cyanide is below detection limits for now. There are 5 monitoring wells used for drinking water and they are located up gradient of the operation and monitored once a year for cyanide - cyanide is below detection limits in 2017.

Éléonore is using mill tailings as underground backfill, and the potential impacts to worker health and safety as well as beneficial uses of groundwater have been evaluated with gas survey and continuous monitoring of the mine water. The results of the monitoring shows that WAD cyanide concentration are well below 0,5mg/L and gas readings indicated levels were at or below 0,3ppm therefore no further protection is necessary.

Seepage from Éléonore has not caused cyanide concentrations in groundwater to rise above levels protective of beneficial use.

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

Summarise the basis for this Finding/Deficiencies Identified:

The operation is in full compliance with Standard of Practice 4.7; Provide spill prevention or containment measures for process tanks and pipelines.

Spill prevention and containment measures are provided for all cyanide unloading, storage, mixing and process solution tanks. Secondary containments are present for all tanks within the concentrator area, as well as the UTEI. All secondary containment areas are constructed of concrete walls and floors that appear to be in good condition and are inspected regularly. All tanks are installed on an adequate concrete foundation as shown by the design drawings. Secondary containments for cyanide unloading, storage, mixing and process tanks are sized to hold a volume greater than that of the largest tank within the containment and any piping draining back to the tank, and with additional capacity for the design storm event where necessary.

Secondary containments are provided for all cyanide containing tanks in the concentrator as well as in the UTEI. In addition to this, sump and sump pumps are also installed in the concentrator area to manage any cyanide solution or cyanide containing water collected in one of the secondary containment area.

All cyanide process solution pipelines are contained within the mill building, and would report to the respective sumps of the area they are related to. There are two exceptions where a pipeline is crossing over an unconfined area. A specific evaluation of these two lines has been undertaken by the maintenance department, and they are subject to a specific inspection regime, with full inspection of these lines using cameras undertaken during shutdowns.

All cyanide tanks and pipelines are constructed with compatible materials, as verified during the site visit and looking at design drawings and design criteria reports.

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

Summarise the basis for this Finding/Deficiencies Identified:

The operation is in full compliance with 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.

Quality control and quality assurance programs were implemented during the construction of new cyanide facilities and when modifications have been made to existing cyanide facilities. The QA/QC programme for the tailings area addresses both the geotechnical properties (compaction, moisture) of the foundation material and the construction material, as well as the installation of the liners.

The content of QA/QC for cyanide storage and process tanks included geotechnical testing and compaction of tank foundations. Quality control and quality assurance records for cyanide facilities have been retained and were made available during the audit.

Appropriately qualified personnel reviewed the cyanide facility construction and provided documentation that the facility was built as proposed and approved. All construction records reviewed included sign-off by the constructing company, the designer and the owner.

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

Summarise the basis for this Finding/Deficiencies Identified:

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

The operation has developed written standard procedures for monitoring activities. The overarching document for environmental activity at Éléonore is called the Environmental management plan. In addition to this Éléonore has developed a suite of environmental procedures, and a sampling programme where different

tasks have been entered into Excel and Outlook computer programmes, that detail the monitoring activities of a particular day, week or month.

Sampling and analytical protocols have been developed by appropriately qualified personnel. The Environmental management plan was designed by environmental engineers from engineering firm SNC Lavalin. All personnel in the environmental department have engineering degree in the field of environmental engineering or applied sciences.

The water sampling procedure specify the following:

- How and where samples should be taken;
- Sample preservation techniques;
- Chain of custody procedures;
- Shipping instructions; and
- Details of the cyanide species to be analysed.

Conditions under which samples are taken are documented in writing in the field log books, which were reviewed during the audit and contains information regarding weather, wildlife activity, temperature, samples location, time when the samples were taken, and any other relevant information noted at the time of sampling.

Éléonore is monitoring for cyanide in discharges of process water both in surface and groundwater downgradient of the site. There are a total of 16 surface water sampling locations around the PAR, the UTEI, at the Opinaca reservoir and in and around the concentrating plant and the waste rock dump. The main discharge point is at the UTEI exit (regard 6) and sampling there is undertaken on a daily basis.

The compliance point for discharge into surface water is located in the Opinaca reservoir, and 6 locations are being samples there four times a year (As the samples have to be taken by boat, access is only possible during the summer month. For the other sampling points sampling is generally undertaken once a month during the seven months (generally May to November) where the ground is not frozen, and sampling points are accessible.

There are in total 28 Groundwater Wells installed around the mine and its facilities, including:

- 8 around the PAR
- 3 around the UTEI
- 9 around the waste rock dump
- 4 around the concentrating plant
- 4 around the landfill area

These wells are monitored twice a year for cyanide species. A number of samples are also taken from process water both by the metallurgical department and the environmental department. These are generally undertaken on a shift or a daily basis, as the process water is the potential source of water quality degradation.

The inspections for the PAR and UTEI, as well as the processing plant and environmental inspections are recording wildlife mortality and any mortality is subject to an incident report and investigation. The wildlife mortality is recorded as part of the normal inspection routines and the water and wildlife mortality monitoring is conducted on frequencies sufficient for the parameters and medium to be monitored, and sufficient to identify changes in a timely manner.

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.

☒ in full compliance with

The operation is

☐ in substantial compliance with

Standard of Practice 5.1

☐ not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The operation is in full compliance with Standard of Practice 5.1: Plan and implement procedures for effective decommissioning of cyanide facilities to protect human health, wildlife and livestock.

Éléonore has a closure plan that incorporates plans and procedure for decommissioning cyanide facilities. The closure plan has an outline schedule for decommissioning cyanide facilities. This shows that the overall closure process will take 3 – 5 years to complete, within which all cyanide facilities would be decommissioned.

The decommissioning procedures are reviewed annually to assess the mine's financial obligations. In addition the Quebec mining code requires the closure plan to be updated and resubmitted every 5 years. Éléonore has only recently started operations and so no update has taken place yet.

Standard of

Practice 5.2:

Establish an assurance mechanism capable of fully funding cyanide related decommissioning activities.

☒ in full compliance with

The operation is

☐ in substantial compliance with

Standard of Practice 5.2

☐ not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The operation is in full compliance with Standard of Practice 5.2; establish an assurance mechanism capable of fully funding cyanide-related decommissioning activities.

The closure plan developed by SNC Lavalin has a budget estimate based on third party cost estimates for the decommissioning works. Furthermore, Éléonore is obliged to estimate the cost of such works as part of its financial reporting obligations. The cost estimate for the decommissioning works are updated annually in line with Éléonore's financial reporting obligations. Éléonore is required to update the mine closure plan every five years under provincial legislation. Éléonore is required under the provincial mining legislation of Quebec to provide an irrevocable letter of credit to fully fund the anticipated closure costs of the mine. The letter of credit observed by the auditor is automatically renewed annually.

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 eliminate, reduce and control them.

☒ in full compliance with

The operation is

☐ in substantial compliance with

Standard of Practice 6.1

☐ not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

DMSL has procedures describing how cyanide-related tasks prior to maintenance should be conducted to minimize worker exposure.

Éléonore has developed a full suite of procedures for all cyanide related tasks. The use of PPE is specified in the procedures and pre-work inspections are an integral part of the procedures. Éléonore uses a work card system for allocating tasks to workers. The work card contains the specific procedures, inspections and checklists required to complete each task safely.

At Éléonore the change management is managed through a number of procedures. For major capital investments it is related to the budget approval procedure (AFE). The AFE documentation requires an assessment of the change required and its justification in terms of health and safety, and environmental performance, as well as productivity.

Safety issues are discussed at the start of each shift. If a worker has concerns they are raised at these meetings. In addition, a work card system is in place at Éléonore whereby workers can raise concerns or suggestions for issues that arise during the shift. The cards are reviewed by supervisors and management. They are then displayed in the section noticeboards until the issues are resolved.

Furthermore as part of the development of new procedures, operators are required to submit input and sign off on them once fully reviewed. For changes to procedures, for example after a worker suggestion, a planned task observation or an incident, there is a review system which includes the health and safety and the environmental departments.

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

Summarise the basis for this Finding/Deficiencies Identified:

Cyanide is delivered in ISO-containers. It is prepared by mixing with water which has been dosed with sodium hydroxide NaOH to maintain the pH above 11.5. The concentration of this 'reagent grade' cyanide is 25% NaCN by weight. Reagent grade cyanide is dosed into the leach tanks which are maintained at a pH of around 10.5. In the Acacia intensive leach reactor cyanide is dosed at 2.5% NaCN at a pH of 12.

Éléonore has both fixed and portable HCN detectors. The fixed detection meters are calibrated every 6 months in accordance with the manufacturers' recommendations. The portable monitors are bump tested daily. Éléonore has a service agreement with Industrial Scientific (IS) to ensure the correct calibration and functioning of the 'GasBadge' portable detectors. Through Industrial Scientific's ISNET system, the daily bump testing of the portable detectors is registered in a database. In the case that a detector is out of specification, an alert is railed immediately not to use that detector, and a replacement ordered directly from IS.

Detectors are set with two alarm levels. The first at 4ppm, which requires a local response and evacuation. At 10ppm a general mill evacuation is required.

The induction presentation regarding the use of cyanide in the mill building has a detailed plan showing all areas where cyanide is present and where it may be encountered in elevated concentrations, such as mixing, leaching, elution and smelting areas.

The operations, maintenance, environmental and emergency response procedures have been prepared to ensure the presence of cyanide is noted and the correct precautions taken to avoid exposures, such as control of pH, rinsing prior to maintenance and, use of PPE such as gloves, Tyvek or Tychem suits, supplied air equipment etc.

Both the fixed and portable HCN monitoring equipment is maintained in accordance with the manufacturers' requirements. The fixed monitors are maintained every 6 months and the portable detectors are bump tested daily before use. Éléonore has an agreement with the manufacturer of the portable equipment, Industrial Scientific (IS) whereby the daily bump tests are automatically recorded in the ISNET database system. Any equipment that fails the bump test is withdrawn from service and replaced by IS.

Prominent signage prohibiting smoking, open flames, eating and drinking (except in designated areas) and the use of PPE is displayed throughout the mill building and cyanide storage and mixing areas.

Safety showers are present at various locations throughout the mill building. The auditors activated several of them during the site inspection to check that they were operating adequately and to observe the response. The auditors reviewed the maintenance records for the emergency showers and eye wash stations. Inert powder type of fire extinguishers are located throughout the mill building. All the inspection tags observed by the auditors were up to date.

All unloading storage, mixing and process tanks and piping containing cyanide solutions are clearly identified with purple colouring, signage and arrows indicating the direction of flow

Up-to-date Materials Safety Data Sheets (MSDS) are available in French and English in the cyanide storage areas and in various locations in the mill building, such as the laboratory and within the emergency response cupboards. The emergency response cupboards also have information on first aid for cyanide intoxication, and instructions on how to use the equipment such as oxygen masks

A number of incident reports relating to cyanide were reviewed during the audit. The incident reports give details of the incidents that occurred and the immediate responses. Then there is a section relating to incident investigation where the reason for the occurrence is determined and the lesson learned from the incident. Lessons learned are then incorporated into undated procedures. For example prior to incident 6155, it was not explicitly required for maintenance workers to use the hood of the Tychem suits required for working. After the investigation of this incident, the procedures were updated so that the use of the hoods is mandatory for maintenance on the reagent grade cyanide lines.

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

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

Éléonore has water, oxygen, a resuscitator, Cyanokit cyanide antidotes (for administration by medical staff only) and communication systems for raising the alarm in the case of an emergency (radios, fixed telephones, mobile telephones). First aid equipment is available at various locations in the plant and office buildings, such as the cyanide storage area, the mixing area, the leach tanks, the Acacia circuit and the medical centre.

The first aid equipment is inspected monthly, and a register of expiry dates of Cyanokit antidotes is maintained. Inspections are performed by the site nurses. The auditors reviewed the records of inspections, the expiry dates of the Cyanokit antidotes, and the tags and pressure gauges on the oxygen cylinders

The site has written emergency response plans to respond to cyanide emergencies, ranging from how to give first aid and the duties of first responders through to plant evacuation and emergency medical evacuation of workers intoxicated with cyanide. Éléonore has various means to provide first aid and medical assistance to workers exposed to cyanide. All mill workers receive first aid training. During interviews on site it was clear to the auditors that the workers understood how to respond in the case of a suspected cyanide exposure, and had been trained in use of first response equipment such as supplied oxygen.

Éléonore has a fully equipped and staffed medical facility with all the necessary equipment and cyanide antidotes to stabilize a worker exposed to cyanide, such as oxygen and Cyanokit (hydroxycobalamin) antidote. The site has various means to provide first aid and medical assistance to workers exposed to cyanide. All mill workers receive first aid training. During interviews on site it was clear to the auditors that the workers understood how to respond in the case of a suspected cyanide exposure, and had been trained in use of first response equipment such as supplied oxygen. Éléonore has a service agreement with AirMedic to evacuate workers exposed to cyanide to off-site medical facilities, by helicopter or airplane. The site also has a formalized agreement with the hospital in Chibougamou to treat workers exposed to cyanide.

Éléonore has a program of mock drills to test the site's ability to respond to cyanide incidents. On completion the results of the drills are evaluated by both workers and management to highlight what worked well and where improvements need to be made. The drill of 17/07/17 was re-run on 02/08/17 after difficulties with communications procedures were identified and rectified.

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.

☒ in full compliance with

The operation is

☐ in substantial compliance with

Standard of Practice 7.1

☐ not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The operation is in full compliance with Standard of Practice 7.1; prepare detailed emergency response plans for potential cyanide releases.

Éléonore has written emergency response plans to respond to cyanide emergencies, ranging from accidents during transportation to the release of solid, liquid and gaseous cyanide during operations.

Éléonore's emergency response plans cover, inter alia, the 10 cyanide release scenarios detailed in the Code:

- a) Catastrophic release of hydrogen cyanide from storage or process facilities; The emergency response plan deals with site evacuation; control of the HCN releases through specific actions in the plant such as pH modification, systems shut-down; notification procedures for areas off site that may potentially be impacted
- b) Transportation accidents; Cyanide is shipped to the site by Chemours, who are responsible for the cyanide until it is delivered to the cyanide storage building. Chemours, and its sub-contractors, are certified under the code to deal with transportation emergencies. In addition, Éléonore has site emergency response procedures for cyanide transportation on site between the cyanide storage building and the mixing area. Furthermore, Éléonore's first responders are trained to deal with transportation emergencies should this be necessary, due to the remoteness of the site and the potentially excessive response time for other first responders from further away.
- c) Releases during unloading and mixing; Éléonore has detailed emergency response plans for cyanide unloading and mixing of the isocontainers.
- d) Releases during fires and explosions; Éléonore has an onsite fire brigade trained to deal with fires and explosions involving cyanide. The written procedures cover such events.
- e) Pipe, valve and tank ruptures; both the operational and emergency response procedures cover actions to be taken in the event of a pipe, valve or tank rupture. Furthermore the plant has been designed to accommodate such events through the provision of secondary containments
- f) Overtopping of ponds and impoundments; Éléonore does not have ponds or impoundments at the site so there are no such facilities that can overtop. All tanks and pipelines are within secondary containment areas that have sump pumps.
- g) Power outages and pump failures; Éléonore has back up power generation systems should these be required due to power failure. The mill has back up pumping systems in case of pump failure (1 duty, 1 standby and 1 spare to ensure redundancy in the pumping systems)
- h) Uncontrolled seepage; Uncontrolled seepage is not specifically considered in Éléonore's emergency response plans since the site does not have a conventional tailings dam or solution ponds. Tailings is managed by dry stacking, and the tailings are filtered after cyanide destruction. All cyanide facilities have secondary containment that is managed through sump pumping. The auditor considers that Éléonore's emergency response plans are adequate in this respect.

- i) Failure of cyanide treatment, destruction or recovery systems; Éléonore's emergency response for failure of the cyanide destruction system is to shut down the mineral processing plant. Solids and solutions in the circuit would be recirculated until such time as the destruction plant is returned to normal operating conditions. The cyanide destruction plant contains various levels of redundancy to ensure that the probability of shut-down is very low.
- j) Failure of tailings impoundments, heap leach facilities and other cyanide facilities. Éléonore does not have a tailings dam or heap leach facility, as the site uses dry-stack tailings or paste backfill with tailings in the underground mine

Éléonore buys cyanide from Chemours and it is delivered to site in isocontainers. Chemours retains reasonability for the cyanide until it is delivered to Éléonore's cyanide store. Chemours' cyanide supply chain is fully certified under the Code, which requires that the transportation routes, physical and chemical form of the cyanide, road conditions and design of the vehicle are taken into consideration. In addition, Éléonore has site emergency response procedures for cyanide transportation on site between the cyanide storage building and the mixing area. Éléonore's first responders are trained to deal with transportation emergencies should this be necessary, due to the remoteness of the site and the potentially excessive response time for other first responders from further away.

The emergency response plans at Éléonore contain detailed requirements for evacuation of personnel and potentially affected communities, use of first aid measures and Cyanokit cyanide antidotes (by medical staff) and for control and containment and mitigation of releases. Éléonore has review processes to help prevent future releases.

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

☒ in full compliance with

The operation is

☐ in substantial compliance with

Standard of Practice 7.2

☐ not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

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

Éléonore workforce has been involved with emergency response planning. There are no nearby permanent communities, the closest being some 250km away. Some families come to the area in the summer time for traditional hunting and fishing activities. The Cree council has been involved in emergency response planning. Éléonore has been in contact with the Cree Nation, and in particular the local Tallyman and the Cree council in Wimandji to communicate the risks associated with accidental cyanide releases. There are no local response agencies, the closest being in Wimandji some 250km away. Notwithstanding, Éléonore has been in contact with the HAZMAT team in Abitibi and has a signed agreement with the hospital in Chibougamou for the victims of cyanide intoxication. Éléonore has regular communication with the Cree council, part of which deals with emergency response planning. Particular focus of the council has been on transportation emergency planning. Éléonore is also in regular contact with the hospital at Chibougamou and the Air Medic to keep the emergency plans updated.

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

Summarise the basis for this Finding/Deficiencies Identified:

Éléonore's emergency response plans:

- a) Designate primary and alternate emergency response coordinators who have explicit authority to commit the resources necessary to implement the Plan.
- b) Identify Emergency Response Teams. There is a nominated mine rescue team for both surface and underground emergencies. Numerous workers are trained as first responders and there are full time nurses and a medic on site
- c) Require appropriate training for emergency responders. Training for first responders and emergency is defined within the emergency plans and training specifications for each worker.
- d) Include call-out procedures and 24-hour contact information for the coordinators and response team members
- e) Specify the duties and responsibilities of the coordinators and team members
- f) List emergency response equipment, including personal protection gear, available along transportation routes and/or on-site
- g) Include procedures to inspect emergency response equipment to ensure its availability
- h) Describe the role of outside responders, medical facilities and communities in the emergency response procedures. This is quite limited due to the remoteness of the site, although there are potentially outside responses required for transportation incidents and medical evacuations. Furthermore, Éléonore has an obligation to notify Provincial Police and Environmental authorities in case of certain off-site and on site emergencies.

Éléonore has agreements with several outside responders who are aware of their responsibilities. To date they have not been involved in emergency drills due to the remoteness of the site.

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

Summarise the basis for this Finding/Deficiencies Identified:

The operation is in full compliance with Standard of Practice 7.4: develop procedures for internal and external emergency notification and reporting.

Procedure #7 in the Emergency Response Measures Plan contains the emergency communication plan and contact information for the relevant parties. Éléonore has a media communications representative responsible for the media communications plan in the event of an emergency. Community communications are managed through community relations team, with contact information for potentially affected communities. In addition, the mine's emergency response coordinator (Yves Beauchamp) is in direct contact with the emergency response coordinator of Wimandji community.

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

Summarise the basis for this Finding/Deficiencies Identified:

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

Éléonore's emergency response plans include:

- a) Recovery and/or neutralization of solutions or solids. Where possible spills will be returned to the process circuit
- b) Decontamination of soils or other contaminated media. Spills will be stabilized with lime to raise pH and then contaminated material returned to the process circuit. Chemical are not added to destroy the cyanide
- c) Contaminated material is either returned to the process circuit or disposed of in the tailings dry stack
- d) Éléonore has sufficient drinking water in bottles on site for 7 days estimated consumption. In addition further supplies can be delivered to site within 10 hours, even during winter

The emergency response plans specifically prohibit the use of chemical such as sodium hypochlorite, ferrous sulphate and hydrogen peroxide for treating cyanide released to surface water.

The emergency response plans include the requirement for environmental monitoring and analysis as part of the emergency response. The methods for doing this are detailed in operational procedures for sampling after a spill and disposal of contaminated materials.

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

Summarise the basis for this Finding/Deficiencies Identified:

The operation is in full compliance with Standard of Practice 7.6 to periodically evaluate response procedures and capabilities and revise them as needed.

Éléonore plans emergency response drills to cover both health and safety and environmental scenarios and to ensure that both shifts are tested. Drills are performed around twice per year to evaluate the emergency response process. Drills are evaluated to verify the effectiveness of the emergency response plan. Where failings have been noted in the plan these have been addressed in the written plans and the response teams briefed as to the changes. Éléonore noted an improvement in response after briefing on the lessons learned from previous as evidenced in the drills undertaken in July and August of 2017. Notwithstanding drills, the emergency response plan is reviewed annually.

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.

☒ in full compliance with

The operation is

☐ in substantial compliance with

Standard of Practice 8.1

☐ not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

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

Éléonore provides comprehensive training in cyanide hazards, where cyanide may be encountered in the mill and in recognizing symptoms of cyanide intoxication. Cyanide refresher training is undertaken on-line using the Chemours system. Éléonore maintains comprehensive training records for all employees and sub-contractors. The Chemours training records are maintained on-line in Chemours database.

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.

☒ in full compliance with

The operation is

☐ in substantial compliance with

Standard of Practice 8.2

☐ not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The operation is in full compliance with 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.

Operational training is given to staff working with cyanide to perform their normal production tasks. Training was confirmed by reviewing the training records spreadsheet, and by interviewing operators on site regarding the training they had received. This includes reviewing the operational and emergency response procedures, working with experienced colleagues, and being evaluated for competence by their supervisors. This is followed up by periodic task observations to ensure that the procedures are implemented as intended. The training elements are identified in the training materials.

Operational supervisors are trained by the mill training supervisor to give the on-the-job training to the operators. Cyanide training is performed before a new employee or contractor is permitted to enter the mill building. Refresher training is provided annually via the Chemours on-line cyanide hazard training modules. Cyanide training is evaluated by tests which are recorded on the on-line training database. Auditor interviews with operations staff and sub-contractors encountered a high level of awareness of cyanide hazards, symptoms of intoxication and of first aid responses.

Training records are maintained throughout an employee's employment. Records of contractor training are also maintained. Test records are maintained in the same database.

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

The operation is in full compliance with Standard of Practice 8.3; train appropriate workers and personnel to respond to worker exposures and environmental releases of cyanide.

The training materials for operations where cyanide may be encountered, and the Chemours on-line training module include details of first response actions to be undertaken in the event of encountering cyanide intoxication. The training materials for operations where cyanide may be encountered, and the Chemours on-line training module include details of decontamination, and first response, which at Éléonore is limited to decontamination, removal to an area with fresh air, provision of oxygen and calling the medical services.

First responders and emergency response teams are trained in detail on responding to cyanide incidents including the use of supplied air systems, chemical protection suits. Only the medical staff are permitted to administer the Cyanokit intravenous hydroxycobalamin cyanide antidote. Offsite responders are familiar with the emergency response procedures. Éléonore has a written agreement with the Chibougamou hospital, a service contract with Air Medic for medical evacuation of cyanide intoxication victims. The site is in contact with the Cree Council in Wemundji regarding emergency response procedures.

Refresher training is provided annually via the Chemours on-line cyanide training modules.

Cyanide emergency drills are programmed twice annually, across two shifts. They cover worker exposures, such as a casualty in the cyanide storage building and environmental releases such as an isocontainer truck fire and solid cyanide release. Cyanide emergency drills are reviewed to evaluate what went well and where the procedure or responses can be improved. Procedures are updated and additional training given where shortcomings are identified and rectified. Éléonore noted an improvement in response after briefing on the lessons learned from previous as evidenced in the drills undertaken in July and August of 2017.

Training records are maintained with details of the trainer, date, topics and employee testing.

PRINCIPLE 9 – DIALOGUE

Engage in Public Consultation and Disclosure

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

☒ 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; provide stakeholders with the opportunity to communicate issues of concern.

Éléonore has a very close relationship with local communities, the Cree bands in the area, the local 'Tallyman'. The consultation process is very structured between the Wimandji Grand Council and the mine. Éléonore meets with the local communities' representatives 16 times per year. Communities are provided with phone numbers at the mine to pass on their comments and concerns, and such communication are received both by phone and by text message. The communities along the James Bay highway have been involved in discussions regarding the transportation of cyanide to the site. Issues faced by the site include for example how to translate the word cyanide into the Cree language (it is roughly 'the substance that extracts gold from rock')

A recent MSc student interviewed 30 stakeholders and raised 20 points of improvement, including how to improve dialogue mechanisms to involve the Wimandji Council and not just the chief of the band. A summit was held in August 2017, where issues such as transportation and spill response were discussed.

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

☒ in full compliance with

The operation is

☐ in substantial compliance with

Standard of Practice 9.2

☐ not in compliance with

Summarise the basis for this Finding/Deficiencies Identified:

The operation is in full compliance with Standard of Practice 9.2; initiate dialogue describing cyanide management procedures and responsively address identified concerns.

Éléonore is proactive in its approach to initiating discussions relating to cyanide with stakeholders. Throughout the design and construction process cyanide was a key topic of discussion with the local communities, although it has become less so since the start of operations

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

Summarise the basis for this Finding/Deficiencies Identified:

The operation is in full compliance with Standard of Practice 9.3; make appropriate operational and environmental information regarding cyanide available to stakeholders.

The auditors reviewed various written materials that have been presented to the communities, such as presentations, information leaflets and the Jamesian newsletter. These materials are available to communities and other stakeholders and contain details of the operations at the site and how cyanide is managed, both during transportation and at the site.

Éléonore is required to report to the Provincial authorities:

- a) Cyanide exposure resulting in hospitalisation or fatality.
- b) Cyanide releases off the mine site requiring response or remediation.
- c) Cyanide releases on or off the mine site resulting in significant adverse effects to health or the environment.
- d) Cyanide releases on or off the mine site requiring reporting under applicable regulations.
- e) Releases that are or that cause applicable limits for cyanide to be exceeded.

This information is available to the public. There have been no such incidences which have required reporting to the authorities.

Furthermore, as part of the community agreement signed with the local communities, the Cree Opinaca Collaboration Agency for Development (COCAB) receives detailed information on Health, Safety, Security and Environment (HSSE).

A publication entitled The Jamesian is published twice annually to communicate progress at the mine. In addition, Goldcorp published an annual Sustainability report. Amongst the information reported are health and safety and environmental incidents. In the area of the mine, the elders of the Cree Nation (about 30% of the population) only speak Cree. Éléonore is funding a radio show in Wimandji to assist with the ongoing dissemination of information. During the design and construction of the mine site, information was shared at public meetings where information was given in the Cree language.

Signature Page

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