MINISTRY OF ENVIRONMENT AND PARKS
COMPLIANCE AND ENVIRONMENTAL ENFORCEMENT BRANCH

DETERMINATION OF ADMINISTRATIVE PENALTY

April 14, 2026

File: 2025-09 7613

Email: kharmati@barrick.com; gregory.ritchie@barrick.com; erussell@lawsonlundell.com; jnyland@lawsonlundell.com

Barrick Gold Inc.
PO Box 788
Penticton, BC V2A 6Y7

Attention: Barrick Gold Inc
RE: Final Determination of Administrative Penalty

Further to the Notice Prior to Determination of Administrative Penalty ("Notice") and accompanying Penalty Assessment Form ("PAF") issued to you on February 9, 2026, I have now made a Determination of Administrative Penalty ("Determination") in this matter.

After reviewing the information available to me, I have concluded that Barrick Gold Inc. ("Barrick") has failed to comply with Permit 7613 Section 1.1.1, in respect of which an administrative penalty is being imposed pursuant to Section 115 of the *Environmental Management Act* ("EMA") and the Administrative Penalties (EMA) Regulation ("APR").

The detailed reasons for my decision are provided in the attached PAF.

Final Penalty Assessment

TOTAL: $52,500

Reasons for Decision

In making this Determination, I have considered all of the information available to me. I note Barrick declined its Opportunity to be Heard. In reaching this Determination, I have carefully considered all the arguments, relevant documents, evidence, and submissions before me, whether they are specifically referred to or not. My reasons for decision include a consideration of the failures as well as the matters listed in Section 7(1) of the APR, as applicable.

The "Administrative Penalty Handbook: Version 2 – Ministry of Environment and Parks – *Environmental Management Act* and *Integrated Pest Management Act*" ("AMP Handbook") provides high level guidance to Ministry staff considering the assignment of administrative penalties. Statutory Decision Makers consider, and decisions are informed by, this document. I have considered the AMP Handbook in making this Determination.

Considering the AMP Handbook in making my Determination is consistent with the Environmental Appeal Board's ("EAB") findings in *United Concrete & Gravel Ltd. v Director, Environmental Management Act* (Decision No. EAB-EMA-21-A005(a), September 27, 2021)[1], at para. 72:

> "Throughout my reasons, I have referred to the Handbook. After having reviewed the Handbook, I find it to be a reasonable guide for determining the appropriate quantum of an administrative penalty under the Act. It fosters consistency and predictability in decision-making. No other resources or authorities were provided to me. For these reasons, I have found the Handbook persuasive in my reasoning."

Due Date & Payment

Payment of this administrative penalty is due within thirty (30) calendar days after the date of service of this Determination. You will be sent an invoice, to be paid via cheque or money order made payable to the Minister of Finance. Payment can be mailed to Business Services at:

> Financial Services Branch
> Corporate Services for the Natural Resource Ministries
> Ministry of Water, Land and Resource Stewardship
> PO Box 9356 Stn Prov Govt
> Victoria, BC V8W 9M2

Please do not mail cash. A $30 service fee will be charged for dishonoured payments.

If payment has not been received in the thirty (30) calendar day period, interest will be charged on overdue payments at a rate of 3% + the prime lending rate of the principal banker to the Province per month and the amount payable is recoverable as a debt due to the government. In the event of non-payment you will be ineligible for a permit or approval, or to amend a permit or approval, until the penalty is paid in full. Further, I am authorized by Section 18 of EMA to cancel or suspend your current authorization in the event of non-payment and if I decide to do so, you will be notified accordingly.

Right to Appeal

If you disagree with this Determination, Division 2 of Part 8 of EMA provides information for how to appeal my decision to the EAB. In accordance with EMA and with the EAB Procedures Regulation, the EAB must receive Notice of the Appeal no later than 30 calendar days after the date you receive this Determination of Administrative Penalty. The notice must include:

- your name and contact information (including address, phone number, and email)

[1] EAB-EMA-21-A005a.pdf (bceab.ca)

- the name and contact information (including address, phone number, and email) of anyone who will represent you in the appeal
- details of the decision (the date it was made – if known, who made it, and how and when you received the decision)
- the reasons(s) you think the decision is wrong
- what you would like the EAB to do about the decision you are appealing
- sign and complete all sections of the notice and submit it to the EAB via mail or email, including a $25 appeal fee via cheque, money order, or bank draft payable to the Minister of Finance

The Notice of Appeal form is available online at https://www.bceab.ca/resources/forms-and-templates. It should be completed and sent by email to info@bceab.ca, or by registered mail to:

Environmental Appeal Board
1175 Douglas Street, Suite 200
Victoria, BC V8W 2E1

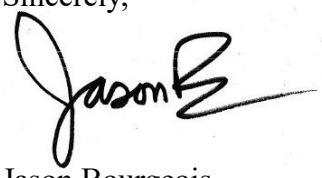
For further information, please consult the EAB website at https://www.bceab.ca. If the administrative penalty is appealed to the EAB and the penalty is upheld, payment is due within 30 calendar days after receiving a copy of the order or decision of the appeal board, or, if the EAB has sent the matter back to the decision maker, within 30 calendar days after a new Determination of Administrative Penalty is served.

Publication

Seven days after the date of service, this Determination will be published on the Natural Resource Compliance and Enforcement Database ("NRCED") Website: https://nrced.gov.bc.ca/

If you have any questions with regards to this Determination, please contact me at 250-312-7179 or Jason.Bourgeois@gov.bc.ca.

Sincerely,



Jason Bourgeois
Delegate of the Director, *Environmental Management Act*

Attachments:
2025-09 Final Penalty Assessment Form

cc: Natasha Olsoff, Environmental Protection Officer
Natasha.Olsoff@gov.bc.ca

Nadine Schwager, Environmental Protection Officer
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Brady Nelless, Executive Director, Compliance and Environmental Enforcement Branch
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PERMRECL@gov.bc.ca

COS Zone Mailbox

Ministry of Environment and Parks

PENALTY ASSESSMENT FORM FILE: 2025-09

Name of Party

Barrick Gold Inc. ("Barrick")

Contravention or Failure

Failure to comply with Permit 7613 Section 1.1.1 (Authorized Discharges):

1.1. The discharge of effluent to which this Sub-Section is applicable is from an effluent biological treatment operation to Hedley Creek (Twenty Mile Creek), as shown on the attached Site Plan C. The reference number (EMS site number) for this discharge is E223876.

1.1.1. The maximum rate at which effluent may be discharged is 600,000 cubic meters per year, and regulated according to the following three-level creek protection hierarchy:

1. The permittee must not discharge effluent in such a manner or quantity as to exceed the water quality objectives in Hedley Creek (see Appendix I);

2. The dilution ratio of effluent discharge must be in a manner or quantity that has a dilution ratio that is greater than a ratio of 40 cubic meters of Hedley Creek water to 1 cubic meter of discharge effluent;

3. The permittee must not discharge effluent at any time, which exceeds the characteristics of section 1.1.2.

APPENDIX I - WATER QUALITY OBJECTIVES, HEDLEY CREEK

Cobalt, total, for the protection of freshwater aquatic life maximum 0.9 µg/L

Date of Contravention

- November 1, 2023
- December 6, 2023
- January 3, 2024
- February 7, 2024
- March 6, 2024
- August 7, 2024
- September 4, 2024
- October 9, 2024
- November 6, 2024
- December 4, 2024

Background

1. Barrick is a company registered in British Columbia ("BC") that owns and operates several gold and copper mines in North America, Latin America, and Asia Pacific, as well as Africa

and the Middle East. One of these is the Nickel Plate Mine, located 3 km southeast of Hedley and 32 km west of Penticton, BC.

2. The Nickel Plate Mine was an underground and later open pit gold mine that has been in active care and maintenance since 1996. The Nickel Plate Mine site consists of reclaimed open pits and waste rock dumps, a covered tailings storage facility, a seepage extraction system, a water treatment plant ("WTP"), and related support facilities.

3. Ponded water and seepage from the tailings storage facility is treated by a WTP prior to discharge to Hedley Creek via a pipeline and diffuser. Hedley Creek is a tributary of the Similkameen River.

4. As a result of historical mining activity, a number of contaminants of concern are present in the effluent discharges into surface waters that occur at the Nickel Plate Mine, specifically heavy metals such cobalt.

5. This Administrative Penalty ("AMP") assessment is for the period of November 1, 2023 to December 4, 2024, when Barrick failed to comply with Section 1.1.1 of Permit 7613.

6. Please refer to the Summary of Relevant Facts for further information related to this AMP, including Contaminants of Concern and Receiving Environment information.

Authorization for Environmental Discharge – Permit 7613

7. The provincial regulatory authorization governing the discharge of effluent from the Nickel Plate Mine is Permit 7613 ("Permit") issued pursuant to EMA.

8. The Permit was issued and is administered by the BC Ministry of Environment and Parks ("Ministry").

9. The Permit authorizes the discharge of effluent from a gold mine and mill operation to a tailings impoundment and to the environment at Nickel Plate Mine.

10. The Permit was first issued on June 16, 1987, and amended on August 15, 2021.

11. The Permit was subsequently amended on January 19, 2026. No changes were made to the Section 1.1.1 or Appendix I requirements.

[2026-01-19 Permit 7613]

12. This AMP applies to the August 15, 2021, version of the Permit.

[2021-08-15 Permit 7613]

PENALTY CALCULATION

2025-09: Section 1.1.1 (Authorized Discharges)

The Contravention or Failure – Findings:

13. Subsection 1 of Section 1.1.1 requires that Barrick not discharge effluent in such a manner or quantity as to exceed the water quality objectives in Hedley Creek, including a maximum total cobalt concentration of 0.9 µg/L.

14. On the following 10 dates, Barrick failed to comply with Section 1.1.1 when it discharged effluent in such a manner or quantity as to exceed the total cobalt 0.9 µg/L water quality objective in Hedley Creek:

- November 1, 2023
- December 6, 2023
- January 3, 2024
- February 7, 2024
- March 6, 2024
- August 7, 2024
- September 4, 2024
- October 9, 2024
- November 6, 2024
- December 4, 2024

15. Based on the information provided above, an AMP penalty was being considered for failure to comply with Section 1.1.1 on 10 occasions between November 1, 2023 and December 4, 2024. I find that all of these 10 failures to comply have a high degree of similarity with respect to seriousness, and as such it is most efficient to evaluate them together.

16. Based on the information provided above, I find that Barrick failed to comply with Section 1.1.1 on 10 occasions between November 1, 2023 and December 4, 2024.

17. The maximum penalty allowable under the Administrative Penalty Regulation (EMA) ("APR") for each failure to comply with Section 1.1.1 is $40,000.

18. For this AMP assessment, I have the discretion of determining a separate $40,000 penalty for each of these 10 failures to comply with the Permit or consolidating into one penalty. I have decided to exercise my discretion to impose a separate penalty for each failure (i.e., each exceedance of the cobalt limit). As all these failures have a very similar fact pattern, I will analyze them together.

Factors to be Considered in Penalty Calculation:

BASE PENALTY

The base penalty reflects the seriousness of the contravention or failure, based on the following two factors:

Factor a): Nature of the Contravention or Failure

19. **Major.** In the "Administrative Penalty Handbook: Version 2 – Ministry of Environment and Parks – *Environmental Management Act* and *Integrated Pest Management Act*" ("AMP Handbook"), a "major" contravention or failure includes "the most serious compliance issues that by their nature result in a threat to the integrity of the environment or to human health or where a contravention undermines the basic integrity of the overarching

regulatory regime and significantly interferes with the Ministry's capacity to protect and conserve the natural environment. Examples include…exceeding a discharge limit by a significant magnitude (51-100% or more)".[1]

20. Exceedances of the total cobalt limit included in this AMP assessment ranged from 567% to 2,567% over the limit. These exceedances are described in more detail in Table 1 of this Penalty Assessment Form.

21. These exceedances of the Permit discharge limit by such a significant magnitude, are considered as the most serious type of non-compliances, undermine the basic integrity of the overarching regulatory regime and significantly interfere with the Ministry's capacity to regulate.

22. The nature of these 10 failures was proposed as major.

23. After considering the relevant information above, I confirm the failures are major.

24. The risk of harm to the environment will be considered in more detail below in Factor b).

Factor b): Real or Potential Adverse Effect

25. **Low to none.** In the AMP Handbook, a "low to none" real or potential adverse effect includes "The contravention does not result in an adverse effect or interfere with the Ministry's capacity to protect the environment or human health, or the potential to do so is low."[2]

26. Section 7(1)(b) of the APR requires that I must consider the real **or potential** adverse effect of the failures. A finding of potential adverse effect of the failures is enough to apply this factor.

27. Under the AMP Handbook, I am guided to consider whether the real or potential adverse effects have a low to none, medium, or high classification. In considering Factor b), I am guided by the AMP Handbook that a relevant question to ask is "How serious is the actual or potential harm or "adverse effect" to the environment or human health?"[3]

28. Exceedances of the total cobalt limit included in this AMP assessment ranged from 567% to 2,567% over the limit.

29. Cobalt is an essential element for human and animal life but is toxic in high concentrations. In freshwater aquatic ecosystems, aquatic invertebrates appear to be the most sensitive group of organisms to cobalt exposure, followed by fish and plants. High concentrations of cobalt can result in reduced growth and emergence and reproductive effects in aquatic invertebrates.

[1] AMP Handbook, at p. 42.
[2] AMP Handbook, at p. 43.
[3] AMP Handbook, at p. 42.

30. I am guided by the AMP Handbook that another relevant question to ask under this factor is "How sensitive is the environment in the location where the contravention occurred?"[4]

31. The receiving environment applicable to Section 1.1.1 is Hedley Creek. Several fish species have been observed in Hedley Creek.

32. Barrick has commissioned studies that have determined that the cobalt species in the discharge to Hedley Creek have low bioavailability, which results in toxicity effect thresholds that are orders of magnitude higher than the British Columbia Water Quality Guidelines ("BC WQGs") for the protection of freshwater aquatic life. The effect thresholds that have been identified are also far higher than the concentrations that have been measured at the downstream location on Hedley Creek. This work shows that the concentrations of cobalt in the Hedley Creek discharge are non-toxic and indicate a low risk of adverse effects.

33. The 2020 benthic monitoring showed greater density, richness, diversity and presence of sensitive species downstream of the discharge.

34. Targeted site-specific toxicity assessment for Cahill Creek and Redtop Gulch identified that output from the WTP with cobalt concentrations as high as 367 µg/L was not acutely toxic to Rainbow Trout (*Oncorhynchus mykiss*) and did not cause lethal or sublethal effects on *Ceriodaphnia dubia* ("*Daphnia*").

35. The real or potential adverse effect of these 10 failures was proposed as low.

36. After considering the relevant information above, I confirm that the failures are low.

37. The base penalty is therefore confirmed at $7,500 as proposed at Notice Prior to Determination of Administrative Penalty ("Notice").

APPLICATION OF PENALTY ADJUSTMENT FACTORS

The following factors reflect the unique circumstances of this file, including what happened before, during, and after the failures.

Factor c): Previous contraventions or failures, penalties imposed, or orders issued (+):

38. I am guided by the AMP Handbook for this factor, to consider Barrick's compliance history. This factor could increase the penalty.

39. In the ten years prior to Inspection Report ("IR") 237636, the Ministry issued Barrick two AMPs. In the five years prior to IR 237636, the Ministry issued Barrick five Warning IRs. Barrick was given the opportunity to respond to these seven failures and contraventions.

[2025-09 Compliance History]

40. An increase of 40% of the base penalty (+ $3,000) was proposed for the previous failures and contraventions.

[4] AMP Handbook, at p. 43.

41. After considering the relevant information above, I confirm an increase of 40% of the base penalty (+ $3,000) is applied for the previous failures and contraventions.

Factor d): Whether contravention or failure was repeated or continuous (+):

42. I am guided by the AMP Handbook for this factor, to consider whether there is any evidence of the repeated or continuing nature of the failures. If I am persuaded that the failures were repeated or continuous, this factor could increase the penalty.

43. The failure to comply was repeated on 10 dates.

44. A separate penalty is considered for each failure in lieu of an increase of the penalty amount under this factor.

45. No adjustment was proposed for this factor.

46. After considering the relevant information above, I confirm no adjustment is applied under this factor.

Factor e): Whether contravention or failure was deliberate (+):

47. I am guided by the AMP Handbook for this factor, to consider whether there is any evidence indicating that Barrick deliberately discharged effluent that exceeded the Permit limits. If I am persuaded that Barrick deliberately discharged effluent that exceeded the Permit limits, this factor could increase the penalty.

48. The AMP Handbook describes deliberateness as "a person's awareness of their requirements and the control they had over the events that led to the contravention. For a contravention to be considered deliberate, the person must have been aware of their requirements and have had some degree of control over the events that constituted the contravention."[5]

49. I find that only previous AMPs issued relative to when Barrick could have possibly done something to avoid the current non-compliances are relevant for consideration under this factor. This is limited to previous AMPs where either the Notice or Determination were issued prior to November 1, 2023.

50. On June 15, 2022, the Ministry issued AMP 2021-43 to Barrick in the amount of $35,000 for failure to comply with Section 1.1.1 for 52 cobalt exceedances between February 6, 2019 and September 1, 2021.

51. On March 5, 2025, the Ministry issued AMP 2024-14 to Barrick in the amount of $114,750 for failure to comply with Section 1.1.1 for 17 cobalt exceedances between September 18, 2021 and October 5, 2023. The Determination for AMP 2024-14 was issued after all the dates of contravention in this AMP assessment. However, I find that AMP 2024-14 is somewhat relevant under this factor, in that the Notice was issued July 9, 2024, before half of the contraventions proposed in the current AMP. Further, the IR giving rise to AMP 2024-14 was issued on October 24, 2023 (IR 216202, before all dates of contravention considered in this AMP assessment).

[5] AMP Handbook, at p. 50.

52. As discussed below in Factor g), from 2017 to 2024, Barrick worked with various consulting firms to explore potential treatments for cobalt in the mine water and commissioned numerous studies relating to water quality at the Nickel Plate Mine. However, I find that the failures to comply were not deliberate.

53. Based on the information above, and considering the guiding concepts of standard of care, intent, source of the failures, and predictability outlined in the AMP Handbook, I find that Barrick exhibited no deliberateness.

54. No adjustment was proposed for this factor.

55. After considering the relevant information above, I confirm no adjustment is applied under this factor.

Factor f): Economic benefit derived by the party from the contravention or failure (+):

56. I am guided by the AMP Handbook for this factor, to consider whether there is any evidence indicating that Barrick obtained an economic benefit from the failures. If I am persuaded that Barrick obtained an economic benefit from the failures, this could increase the penalty.

57. Barrick may have derived an economic benefit from not implementing adequate treatment for cobalt. However, no treatment has been identified to date that can adequately treat the cobalt concentrations. Any estimated economic benefit would be speculative and not defensible. This specific economic benefit has been considered but will not be pursued in this AMP assessment.

58. Barrick likely derived some economic benefit from failing to pursue a Permit amendment to increase the cobalt limit, which it has been arguing since 2015. However, any specific economic benefit derived from Barrick's failure to pursue a Permit amendment would be difficult to estimate or quantify, particularly in light of the additional studies that Barrick has commissioned. This specific economic benefit has been considered but will not be pursued in this AMP assessment.

59. No adjustment was proposed for this factor.

60. After considering the relevant information above, I confirm no adjustment is applied under this factor.

Factor g): Exercise of due diligence to prevent the contravention or failure (-):

61. I am guided by the AMP Handbook for this factor, to consider what Barrick did **before** the failures to prevent the failures. If I am persuaded that Barrick did take measures to prevent the failures, this factor could decrease the penalty.

62. From 2017 to 2024, Barrick took efforts to prevent the failures, including:

    - 2017 to 2013: worked with various consulting firms to explore four potential treatments for the cobalt in the mine water
    - 2018 to 2019: hired Wood Environment & Infrastructure Solutions to work on a plan for replacing the WTP, which was aging

- 2018 to 2023: conduct cobalt speciation analysis to identify the species of cobalt present and inform the search for a treatment
- 2021: existing WTP was repaired to improve reliability and extend its life
- 2022 to 2023: worked with SRK Consulting (Canada) Inc. to submit a Best Achievable Technology ("BAT") Assessment to the Ministry
- 2020 to 2024: commissioned numerous other studies related to water quality at the Nickel Plate Mine
- 2017 to 2024: studies of water treatment alternatives (including semi-passive treatment), toxicity investigation, influent and effluent analysis, geochemical modelling, geotechnical work, water pipeline location/alignment studies, wildlife studies, archaeological assessments, seepage capture studies, tailings analysis, and water balance modeling

63. A decrease of 50% of the base penalty (- $3,750) was proposed for measures to prevent the failures.

64. After considering the relevant information above, I confirm a decrease of 50% of the base penalty (- $3,750) is applied for measures to prevent the failures.

Factor h): Efforts to correct the contravention or failure (-):

65. I am guided by the AMP Handbook for this factor, to consider what Barrick did **during or immediately surrounding** the failures to restore compliance or reverse or mitigate the impacts. If I am persuaded that Barrick did take actions after the failures to restore compliance or reverse or mitigate the impacts, this factor could decrease the penalty.

66. I am not aware of any efforts to correct the failures.

67. No adjustment was proposed for this factor.

68. After considering the relevant information above, I confirm no adjustment is applied under this factor.

Factor i): Efforts to prevent reoccurrence of the contravention or failure (-):

69. I am guided by the AMP Handbook for this factor, to consider whether Barrick has taken any action **after** to avoid the failures happening again in the future. If I am persuaded that Barrick has taken any action to avoid the failures happening again in the future, this factor could decrease the penalty.

70. On May 30, 2025, Barrick submitted a Preliminary Application for an Authorization Amendment. The Discharge Factors Amendment Form in the amendment application requested an amendment of the Hedley Creek cobalt limit for the protection of freshwater aquatic life from 0.9 µg/L to 367 µg/L. However, this permit amendment is currently in the Preliminary Application phase and no decision regarding the amendment request has been made by the Ministry at this time.

71. A decrease of 10% of the base penalty (- $750) was proposed for efforts made to prevent reoccurrence of the failures.

72. After considering the relevant information above, I confirm a decrease of 10% of the base penalty (- $750) is applied for efforts made to prevent reoccurrence of the failures.

Factor j): Any other relevant factors (+/-):

73. I am guided by the AMP Handbook for this factor, to consider any additional factors which could increase or decrease the penalty. Such factors could include cost to government, cooperation, degree of remorse, ability to pay, and financial impact. These additional factors may increase or decrease the penalty.

74. After reviewing Ministry files, I find that Barrick has consistently self-reported its Cobalt Limit exceedances, as it is required to do under Section 5.2.1 of the Permit, and this is an example of cooperative behaviour. Further, I find that Barrick has been cooperative in providing several updates to the Ministry to keep it "apprised of progress".

75. A decrease of 10% of the base penalty (- $750) was proposed for Barrick's cooperative behaviour under this additional factor.

76. After considering the relevant information above, I confirm a decrease of 10% of the base penalty (- $750) is applied for Barrick's cooperative behaviour under this additional factor.

Multiplier Application:

77. Separate penalties for each failure described in this administrative penalty are possible since there were multiple failures between November 1, 2023 and December 4, 2024.

78. The application of a multiplier on a daily basis is applied for 10 days between November 1, 2023 and December 4, 2024.

Penalty Calculation Table:

Factors to be considered in penalty calculation:	Notice	Final Determination
Gravity Penalty		
a) Nature of contravention or failure	major	major
b) Real or potential adverse effect	low to none	low to none
Base Penalty:	$7,500	$7,500
c) Previous contraventions or failures, penalties imposed, or orders issued	+ $3,000	+ $3,000
d) Whether contravention or failure was repeated or continuous	$0	$0
e) Whether contravention or failure was deliberate	$0	$0
g) Exercise of due diligence to prevent the contravention or failure	- $3,750	- $3,750

h) Efforts to correct the contravention or failure	$0	$0
i) Efforts to prevent reoccurrence of the contravention or failure	- $750	- $750
j) Additional relevant factors	- $750	- $750
Total Gravity Penalty	$5,250	$5,250
Application of multiplier: Yes	10	10
Economic Benefit Penalty		
f) Economic benefit derived by the party from the contravention or failure	$0	$0
Gravity Penalty + Economic Penalty	$5,250 x 10	$5,250 x 10
Total Penalty:	$52,500	$52,500

Total Penalty:

79. After determining a gravity penalty of $5,250 for these failures, and applying the daily multiplier, the penalty is established at $52,500.

Summary of Relevant Facts

Current AMP

80. On February 5, 2025, the Ministry conducted an inspection to verify compliance with the Permit during the period of November 1, 2023 to December 31, 2024. On March 28, 2025, the Ministry issued amended IR 237636 and found Barrick out of compliance with a number of requirements, including Section 1.1.1 (see Table 1 below). The outcome of IR 237636 was determined to be a Referral for an AMP. On March 30, 2025, Barrick confirmed receipt of IR 237636.

[2025-03-28 IR237636 AMP]
[2025-03-28 IR237636 Delivery]
[2025-03-30 IR237636 Delivery Confirmation]

81. The "Details/Findings" in IR 237636 assessing compliance with Section 1.1.1 stated:

> "**1.1.1(1)**
> A review of data submitted to EMS and reported in the Quarterly Reports determined that the Permittee exceeded the Water Quality Objective (WQO) in Appendix I of the Permit for total cobalt (0.9 ug/L) in Hedley Creek on 11 occasions during the Inspection Period. A full list of Appendix I WQO exceedances is provided in Table 1 appended to this inspection report. … Based on the findings above (i.e., 11 total cobalt WQO exceedances from November 1, 2023, to December 4, 2024), the Permittee has failed to take action to address cobalt exceedances and has continued to discharge effluent into Hedley Creek with significant Permit limit exceedances (up to 2567% over the Permit limit during the Inspection Period). As such, this Permit section (1.1.1(1)) is being referred for an AMP."

82. On March 7, 2025, Barrick sent a response to the Ministry regarding the original IR 237636, dated February 5, 2025. In response to Section 1.1.1, Barrick stated:

> "Since 2017, Barrick has spent in excess of $15 million dollars studying cobalt, water quality, and water treatment/management at Nickel Plate Mine. This particular cobalt complex is very difficult to break down, and no effective treatment option has been identified to date.
>
> The inert nature and chemical characteristics of this cobalt species also mean it has different toxicological properties than the forms of cobalt generally found in freshwater systems, such as dissolved cobalt Co2+, on which the BC WQG for the Protection of Aquatic Life is based.
>
> Recent studies have determined that the cobalt species in the discharge to Hedley Creek have low bioavailability, which results in toxicity effect thresholds that are orders of magnitude higher than the BC WQGs for the Protection of Aquatic Life. The effect thresholds that have been identified are also far higher than the concentrations that have been measured at the downstream location on Hedley Creek. This work shows that the concentrations of Cobalt in the Hedley Creek discharge are non-toxic and science, indicate a low risk of adverse effects.
>
> In relation to a previous Referral for Administrative Penalty (IR216202) for cobalt exceedances under the same permit section, Barrick made submissions to assist ENV in understanding the real or potential adverse effects of exceedances of this species of cobalt. Based on these submissions, the Director reclassified the actual or potential adverse effects from the cobalt limit exceedances referred to in IR216202 (which were of a similar magnitude to those discussed in this IR) as "low to none". In light of this scientific evidence, Barrick is currently preparing to apply for an amendment to the permit's Cobalt objective for Hedley Creek, with input from the Upper Similkameen Indian Band (USIB) and Lower Similkameen Indian Band (LSIB). In addition, Barrick has discussed this planned submission with ENV who have indicated support for this course of action.
>
> Barrick is currently working with USIB and LSIB to establish a regular cadence of meetings and discussions aimed at a collaborative approach to amending the Hedley Creek Cobalt limit in the permit and have indicated to both Nations through these meetings that Barrick intends to submit an amendment to the permit to increase the Cobalt limit in Hedley Creek. At the same time, Barrick is working with USIB and LSIB on reviewing ENV's recent draft permit amendment, which is separate from Barrick's proposed amendment. This includes developing scopes of work for Cobalt toxicity and speciation analysis and long-term modeling, which is called for in ENV's proposed permit amendment. Through this process, Barrick is hoping to incorporate traditional knowledge into the solution."

[2025-03-07 IR237636 Response Letter]

83. On May 30, 2025, Barrick submitted a Preliminary Application for an Authorization Amendment (AMS Job #448395). The Discharge Factors Amendment Form in the amendment application requested an amendment of the Hedley Creek cobalt limit for the protection of freshwater aquatic life from 0.9 µg/L to 367 µg/L. Included in the application

was a “Permit Amendment Description” letter. Section 3.0, Rationale for Proposed Cobalt Objective, stated:

> “During previous studies and the development of the SPOs for Redtop Gulch and Cahill Creek, it was determined that the predominant form of cobalt in the treated effluent at LT#1 exists as a tightly bound anionic complex. This anionic complexed cobalt is not amenable to treatment and has been demonstrated to be non-toxic and non-bioavailable at the proposed amended permit objective. The anionic complexed cobalt is also significantly less bioavailable and less toxic than other forms of cobalt, even at concentrations far exceeding those currently and historically measured at the compliance point in Hedley Creek (HDL CREEK D-S DIFSER, E223874). Specific toxicity and reproductive studies on the treated effluent identified a No Observable Effects Concentration of 367 µg/L, which serves as the basis for the proposed cobalt objective for Hedley Creek.
>
> The detailed results and rationale supporting the proposed cobalt objective are set out in the previously submitted report, which accompanies this application: *Proposed Site Performance Objectives for Arsenic, Cobalt, WAD Cyanide, Nitrate, and Sulphate in Cahill Creek and Red Top Gulch* by Hatfield Consultants LLP (Hatfield, 2024).
>
> As mentioned in this report, and further explained in the *Expert Opinion Report on the Ecotoxicology of Cobalt Associated with the Nickel Plate Mine’s Discharge to Hedley Creek* (Lucas, 2024), the BC Water Quality Guidelines for the Protection of Aquatic Life (BC WQGPAL) for cobalt were derived based on the effects of free cobalt (Co2+, a divalent cation), the properties of which are very different from the anionic complexed cobalt in the treated effluent at LT#1. As a result, it is important to recognize that the complexed cobalt at LT#1 is a different substance from the type of cobalt that the BC WQGPAL and the current Permit objective for Hedley Creek were designed to regulate.
>
> Given that the anionic complexed cobalt has very different properties from free cobalt, it is appropriate to take a science-based approach to regulating cobalt in Hedley Creek, informed by effects of the specific type of cobalt present in the discharged effluent. The proposed cobalt objective for Hedley Creek is consistent with this science-based approach.
>
> Furthermore, other provisions of the Permit provide protection for the receiving environment; for example, clause 1.1.2 of the current Permit sets out non-toxicity requirements for treated effluent that is discharged to Hedley Creek. Amending the cobalt objective for Hedley Creek will not remove this requirement.
>
> Additionally, the 2022 permit amendment, which was in draft at the time of submission of this amendment request, added requirements to perform cobalt speciation at several locations, including at the Hedley Creek compliance point, which enable the site to continue monitoring the types of cobalt present in the treated effluent discharged to Hedley Creek.”

[2025-05-30 Preliminary Application Form]
[2025-05-30 Discharge Factors Amendment Form]
[2025-05-30 Permit Amendment Description]

Previous AMP 2021-43

84. On June 15, 2022, the Ministry issued AMP 2021-43 to Barrick in the amount of $35,000 for failure to comply with Section 1.1.1 for 52 cobalt exceedances between February 6, 2019 and September 1, 2021. AMP 2021-43 has been paid in full.

[2022-06-15 2021-43 Final Determination]

Previous AMP 2024-14

85. On March 5, 2025, the Ministry issued AMP 2024-14 to Barrick in the amount of $114,750 for failure to comply with Section 1.1.1 for 17 cobalt exceedances between September 18, 2021 and October 5, 2023. AMP 2024-14 has been paid in full.

[2025-03-05 2024-14 Final Determination]

86. I was the Director for AMP 2024-14. In the 2014-14 Final Determination, I considered an Opportunity to be Heard submission ("2024-14 OTBH Submission") submitted by Barrick on October 31, 2024. Parts of that 2024-14 OTBH Submission are relevant to the current AMP.

87. At section E.i, Benthic Monitoring – Ecoscape, Annual, of the 2024-14 OTBH Submission, Barrick stated, at paras. 87-91:

    87. "Ecoscape conducts annual benthic monitoring work of watercourses potentially influenced by the Nickel Plate Mine, including Hedley Creek.

    88. In general, this work shows some differences in benthic communities in Hedley Creek up- and downstream of the Nickel Plate Mine discharge. However, Ecoscape has said that these differences "are not likely significant enough to be considered adverse[] …". In fact, certain characteristics observed indicate a mild stimulatory effect downstream, rather than a toxic effect.

    2020 Annual Data Collection and Interpretation Report at p. 57 [Tab 7]

    89. For example, in the 2020 Annual Data Collection and Interpretation Report, Ecoscape identified the following with respect to H1 (upstream of the Nickel Plate Mine discharge) and H2 (downstream of the Nickel Plate Mine discharge):

        a. H2 exhibited greater density than H1;

        b. H2 exhibited greater richness than H1;

        c. H2 exhibited greater diversity than H1; and

        d. H2 exhibited a greater percentage of EPT taxa (measuring the presence of sensitive species).

    2020 Annual Data Collection and Interpretation Report at pp. 51-54

90. These effects do not appear to be consistent with cobalt toxicity.

91. While there may be some differences in the benthic community up and downstream of the Nickel Plate Mine discharge in Hedley Creek, there is no evidence of adverse impacts."

[2024-10-31 2024-14 OTBH Submission]
[2024-10-31 2024-14 OTBH Sub Book of Documents]

88. At section E.ii, Ecotoxicology Analysis – Hatfield, 2021 to 2023, of the 2024-14 OTBH Submission, Barrick stated, at paras. 92-100:

92. "Since 2021, BGI has engaged Hatfield to study the effects of complexed cobalt at the Nickel Plate Mine. Mr. Lucas, who prepared the Lucas Opinion in this matter, is a Manager, Ecotoxicology and Risk Assessment with Hatfield, and has extensive experience with the Nickel Plate Mine.

93. Among other things, Hatfield's work with respect to the Nickel Plate Mine has included the derivation of SPOs for cobalt in Cahill Creek and Redtop Gulch to protect against adverse effects to aquatic life. It has also included the creation of a TARP for these receiving environments. While these locations differ from the Hedley Creek receiving environment, the work carried out for those sites has application to Hedley Creek, as the origin of the cobalt is the same (*i.e.*, via TSF seepage passed through Nickel Plate Mine's WTP).

Lucas Opinion at pp. 7-8

94. At a high level, Hatfield's work has involved testing the survival and reproduction of *Ceriodaphnia dubia* in different water samples, including samples from the site, samples spiked with cobalt chloride (which would be expected to generate Co2+ cations), samples spiked with potassium hexacyanocobaltate (*i.e.*, one of the complexed anionic forms of cobalt that predominate at the Nickel Plate Mine) and a lab control. Hatfield also conducted acute toxicity testing using rainbow trout and *daphnia magna*.

95. *Ceriodaphnia dubia, daphnia magna,* and rainbow trout are all species known to be sensitive to cobalt. Testing was conducted in accordance with the Environment Canada standard test methods. Additional detail on why these tests were selected and test methodology is in the Hatfield Report at [4.2].

Lucas Opinion at pp. 8-10

96. Testing was conducted with and without UV exposure to the samples, as certain research had suggested that UV exposure may break down anionic cobalt complexes.

Lucas Opinion at pp. 4 and 9

97. With respect to the targeted site-specific toxicity assessment for Cahill Creek and Redtop Gulch, Hatfield's work indicated that cobalt concentrations in the LT#1 discharge (*i.e.*, output from the WTP) as high as 367 µg/L (*i.e.*, the maximum

concentration tested) were not acutely toxic to rainbow trout and did not cause lethal or sublethal (*i.e.*, reproduction) effects on *Ceriodaphnia dubia*. As a result, Hatfield recommended cobalt SPOs for both Cahill Creek and Redtop Gulch of 367 µg/L to protect against adverse effects to aquatic life.

Lucas Opinion at pp. 14-18 and 22

98. Similarly, toxicity testing in 2021 and 2022 on samples from D1, LT#1, and Hedley Creek stations HDL CREEK U-S DIFSER and HDL CREEK D-S DIFSER did not identify acute toxicity to organisms (rainbow trout and *Daphnia magna*) at cobalt concentrations as high as 504 µg/L (*i.e.*, the greatest concentration tested for toxicity) and did not identify sublethal toxicity to *Ceriodaphnia dubia* at cobalt concentrations as high as 230 µg/L. Statistically significant effects on *Ceriodaphnia dubia* reproduction (*i.e.*, approximately 11% effect relative the laboratory control) were only observed at tested concentrations of 483 µg/L.

Lucas Opinion at p. 20

99. Based on this evidence, it is Mr. Lucas' expert opinion that the anionic form of cobalt present at the Nickel Plate Mine appears to be less bioavailable than free cobalt – and, thus, less toxic.

Lucas Opinion at p. 14

100. Furthermore, Mr. Lucas opined that the results of his work indicate that, given the type of cobalt in the effluent released from LT#1, the Permit objective for cobalt in Hedley Creek is highly conservative, and risks to aquatic life from the cobalt concentrations in Hedley Creek were low during the Penalty Period.

Lucas Opinion at p. 22"

89. At section G, Exercise of Due Diligence (Factor G), of the 2024-14 OTBH Submission, Barrick stated, at paras. 145-149:

145. "BGI's efforts have included:

a. Over the course of 2017 to late 2023, BGI worked with various consulting firms to explore four potential treatments for the cobalt in the mine water, as summarized at paragraphs 52 to 75.

b. From 2018 to 2019, BGI hired Wood to work on a plan for replacing the WTP, which was aging. Although BGI's intention was for the proposed replacement WTP to include treatment for complexed cobalt, the proposed replacement did not include a design for this, as work was still underway to explore potential cobalt treatments.

c. From 2018 to 2023, BGI or its consultants sent various samples of mine water to Brooks Applied Labs in Washington State to conduct cobalt speciation analysis to identify the species of cobalt present and inform the search for a treatment.

d. In 2021, the existing WTP was repaired to improve reliability and extend its life. No proven cobalt treatment had been identified for the replacement WTP by this time.

e. In 2022 to 2023, BGI worked with SRK to submit a BAT Assessment to ENV, which was followed by two revisions in response to ENV's comments. Unfortunately, despite the aforementioned work to explore cobalt treatments, a proven treatment for the complexed cobalt present at the Nickel Plate Mine was not found.

146. Further, from 2020 to 2024, BGI has commissioned numerous other studies related to water quality at the Nickel Plate Mine. Several of these are referred to in this submission and have been submitted to ENV in other capacities. These include:

a. SRK, IDZ Assessment for Hedley Creek (2020);

b. Hatfield, SPO Development Plan (February 2022);

c. Hatfield, Trigger Action Response Plan (February 2022); and

d. Hatfield, SPOs for Cahill Creek and Redtop Gulch (January 2024).

147. In addition, during this period BGI undertook extensive additional work relating to water quality, water treatment and water management at the Nickel Plate Mine. This work included the following: studies of water treatment alternatives (including semi-passive treatment), toxicity investigation, influent and effluent analysis, geochemical modelling, geotechnical work, water pipeline location/alignment studies, wildlife studies, archaeological assessments, seepage capture studies, tailings analysis, and water balance modeling.

148. In the period from 2022 to 2023, BGI also provided several updates to ENV staff to keep them apprised of progress, including the following:

a. February 3, 2022: Jacobs and BGI presentation to ENV and EMLI on semipassive treatment design;

b. May 10, 2022: SRK, Hatfield, and BGI presentation to ENV on the BAT Assessment; and

c. March 2023: BGI presentation to ENV providing an update on cobalt complex speciation and treatment challenges observed in bench and field scale treatment pilot.

149. BGI has spent at least $15.4 million on the aforementioned studies, reports and work, and countless hours of BGI staff time in an effort to resolve the cobalt exceedances and understand their effects or potential effects on the receiving environment. This is not a matter of there being an easy solution and BGI refusing to implement it, but rather BGI having worked with leading experts in the field of mine water treatment to explore option after option, at great financial cost, to no avail."

90. On February 9, 2026, the Ministry issued a Notice and accompanying PAF to Barrick via email. The Notice recommended one penalty:

    - 2025-09: $52,500 for failure to comply with Section 1.1.1 on 10 occasions between November 1, 2023 and December 4, 2024

91. In the Notice, Barrick was offered an Opportunity to be Heard ("OTBH") and given thirty (30) days to request an OTBH.

92. On February 10, 2026, Barrick confirmed receipt of the Notice and PAF via email.

93. On March 11, 2026, Barrick declined the OTBH.

Contaminants of Concern

94. The BC WQGs "represent safe levels of substances that protect different water uses". For freshwater aquatic life there are both long-term chronic and short-term acute BC WQGs. Long-term chronic BC WQGs "are intended to protect the most sensitive species and life stage against sub-lethal and lethal effects for indefinite exposures." Short-term acute BC WQGs "are set to protect against severe effects such as lethality (e.g. LC50) or other equivalent measures (e.g., EC50) to the most sensitive species and life stage over a defined short-term exposure period (e.g., 96 hours)." Effluent characteristics are compared to these guidelines in order to understand the potential for adverse impacts to the environment as a result of the introduction of waste.

[BC Approved WQG: Aquatic Life, Wildlife & Agriculture]

95. Cobalt is an essential element for human and animal life but is toxic in high concentrations. In freshwater aquatic ecosystems, BC WQGs identify that "invertebrates, such as amphipods, tend to be more sensitive to cobalt than plants or fish, though sensitivity varies across species". High concentrations of cobalt can result in reduced growth and emergence and reproductive effects in aquatic invertebrates.

[BC Cobalt Water Quality Guidelines - Freshwater Aquatic Life]

Receiving Environment

96. The Permit authorizes the discharge of effluent to Hedley Creek. The following fish species have been observed in Hedley Creek:

    - Longnose Dace
    - Mottled Sculpin
    - Rainbow Trout
    - Torrent Sculpin

[Hedley Creek]

Tables

Table 1: Section 1.1.1 exceedances

Date	Permit Limit (µg/L)	Result (µg/L)	% Exceedance
2023-11-01	0.9	13	1,344
2023-12-06	0.9	9	900
2024-01-03	0.9	9	900
2024-02-07	0.9	6	567
2024-03-06	0.9	24	2,567
2024-04-03	0.9	1	11
2024-08-07	0.9	9	900
2024-09-04	0.9	9	900
2024-10-09	0.9	9	900
2024-11-06	0.9	15	1,567
2024-12-04	0.9	15	1,567

Grey sample (<50% exceedance) is excluded from this AMP assessment

Dated this 14th day of April, 2026.