



BUREAU OF AIR POLLUTION CONTROL

Facility ID No. A0005

Permit No. AP1041-2221

MERCURY OPERATING PERMIT TO CONSTRUCT: PHASE II

Issued to: Barrick Goldstrike Mines Inc.

Section II. Specific Operating Conditions

A. Thermal Unit #TU4.008 through TU4.012 location North 4,536.20 km, East 554.61 km, UTM (Zone 11)

A. System 61 – Carbon Reactivation Kiln and Solutions		
TU	4.008	Carbon Reactivation Kiln Drum
TU	4.009	Pregnant Tank A-side
TU	4.010	Pregnant Tank B-side
TU	4.011	Barren Tank A-side
TU	4.012	Barren Tank B-side

1. Air Pollution Equipment

- a. Exhaust gases from TU4.008 through TU4.012 shall be ducted to a control system with 100% capture consisting of:
 - i. Venturi Wet Scrubber (WS-001) for TU4.008
 - ii. Condensation Tower (CT-001)
 - iii. 6.0-ton Carbon Bed (CA-001)
 - iv. 1.65-ton Carbon Bed (CA-002)
- b. Stack parameters
 - i. Height: 100 feet
 - ii. Diameter: 0.958 feet
 - iii. Temperature: approximately 157.9°F
 - iv. Exhaust gases from TU4.008 through TU4.012 shall have a maximum volume flow rate of 3,500 dry standard cubic feet per minute (DSCFM).
 - v. Exhaust gases from TU4.008 through TU4.012 are ducted to 1 stack.

2. Operating Requirements

- a. Limitations of Operation (NAC 445B.3679(3))
 - i. The maximum allowable throughput rate of stripped carbon for TU4.008 shall not exceed 3.0 tons per any one-hour period.
 - ii. The maximum allowable throughput rate to the A-side Pregnant and Barren Tanks (TU4.009 and TU4.011) shall not exceed 250 gallons per minute of solution.
 - iii. The maximum allowable throughput rate to the B-side Pregnant and Barren Tanks (TU4.010 and TU4.012) shall not exceed 250 gallons per minute of solution.
 - iv. The Interim mercury emission limit for System 61 during the demonstration period for establishment of the final mercury emission limit as established in Section II.A.3.e. is 5.0×10^{-3} grains per dry standard cubic foot (gr/dscf) for System 61.
 - v. TU4.008 through TU4.012 each may operate a total of 8,760 hours per calendar year.
 - vi. WS-001 shall be operated while TU4.008 is in operation.
- b. Work Practices Standards (NAC 445B.3679(3))
 - i. Inspect the drum lining of TU4.008 for cracks twice per calendar year.
 - ii. Venturi Wet Scrubber (WS-001):
 - (a) The pressure drop across WS-001 shall be maintained at or above 7.0 inches of water during operation of TU4.008.
 - (b) The water flow rate of WS-001 shall be maintained at or above 27.0 gallons per minute during operation of TU4.008.
 - iii. Condensation Tower (CT-001)
 - (a) Water flow rate to CT-001 shall be maintained at or above 50 gallons per minute (gpm).
 - (b) The exhaust gas temperature exiting CT-001 shall be maintained at or below 100 °F.



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Section II. Specific Operating Conditions (continued)

A. Thermal Unit #TU4.008 through TU4.012 (continued)

2. Operating Requirements

b. Work Practices Standards (NAC 445B.3679(3))

iv. 6-ton Carbon Bed (CA-001):

- (a) CA-001 shall contain at least 6.0 tons of sulfur impregnated carbon during all times of operation.
- (b) The pressure drop across CA-001 shall be measured to determine the optimal operational value(s). Once the optimal operational values have been determined, the pressure drop across CA-001 shall be maintained within these optimal values.
- (c) Replace the sulfur-impregnated carbon in CA-001 according to the following schedule:
Representative carbon samples will be taken using a grain sampler to obtain a composite sample. The depth of the samples will be recorded. The percentage of mercury by weight will be calculated as the average loading from the samples. The loading capacity of the sulfur-impregnated carbon is 20% by weight. Sampling will be conducted quarterly, at the same sample depths, until 50% of the loading capacity is reached. Upon reaching 50% of the loading capacity, ~~sampling of the carbon will occur monthly until 90% of the loading capacity is reached.~~ The carbon will be replaced with an equivalent or better performing carbon no later than 30 days after reaching 90% of the loading capacity. The required mercury analysis shall be performed utilizing one of the following methods:
 1. EPA method 6020-Inductively Coupled Plasma-Mass Spectrometry;
 2. EPA method 7471B-Mercury in Solid or Semisolid Waste (Manual Cold-Vapor Technique); or
 3. An alternative test method as approved by the Director.

v. 1.65-ton Carbon Bed (CA-002):

- (a) CA-002 shall contain at least 1.65 tons of sulfur impregnated carbon during all times of operation.
- (b) The pressure drop across CA-002 shall be measured to determine the optimal operational value(s). Once the optimal operational values have been determined, the pressure drop across CA-002 shall be maintained within these optimal values.
- (c) Replace the sulfur-impregnated carbon in CA-002 according to the following schedule:
Representative carbon samples will be taken from near the inlet and exit of CA-002. The depth of the samples will be recorded. The percentage of mercury by weight will be calculated as the average loading from the samples. The loading capacity of the sulfur-impregnated carbon is 20% by weight. Sampling will be conducted quarterly, at the same sample depths, until 50% of the loading capacity is reached. Upon reaching 50% of the loading capacity, sampling of the carbon will occur monthly until 90% of the loading capacity is reached. The carbon will be replaced with an equivalent or better performing carbon no later than 30 days after reaching 90% of the loading capacity. The required mercury analysis shall be performed utilizing one of the following methods:
 1. EPA method 6020-Inductively Coupled Plasma-Mass Spectrometry;
 2. EPA method 7471B-Mercury in Solid or Semisolid Waste (Manual Cold-Vapor Technique); or
 3. An alternative test method as approved by the Director.

3. Monitoring, Recordkeeping, Reporting, and Testing (NAC 445B.3379.3)

a. Compliance Testing

Within 180 days of the implementation of NvMACT for System 61 as required in Section I.Q, the *Permittee* shall conduct and record a performance test for mercury on the exhaust stack of System 61 consisting of three valid runs utilizing US EPA Method 29 of 40 CFR part 60 Appendix A.



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Section II. Specific Operating Conditions (continued)

A. Thermal Unit #TU4.008 through TU4.012 (continued)

3. Monitoring, Recordkeeping, Reporting, and Testing (NAC 445B.3379.3)

b. Monitoring

The *Permittee* shall:

- i. Prior to implementation of NvMACT for System 61, install, operate, calibrate, and maintain instrumentation to measure and record the following:
 - (a) The flow rate of solution to TU4.009 through TU4.012 each, in gallons per minute.
 - (b) The pressure drop across WS-001, in inches of water.
 - (c) The water flow rate to WS-001, in gallons per minute.
 - (d) The water flow rate to CT-001, in gallons per minute.
 - (e) The exhaust gas temperature exiting the CT-001, in degrees Fahrenheit.
 - (f) The differential pressure across CA-001 and CA-002 each, in inches water column.
- ii. Monitor the daily throughput rate of stripped carbon for TU4.008 in tons.
- ~~iii. Monitor the throughput rate of solution of the A-side Pregnant and Barren Tanks (TU4.009 and TU4.011), once during each day of operation.~~
- iv. Monitor the throughput rate of solution of the B-side Pregnant and Barren Tanks (TU4.010 and TU4.012), once during each day of operation.
- v. Monitor the daily hours of operation for TU4.008 through TU4.012 each.
- vi. Monitor the pressure drop across WS-001 once, during each day of operation.
- vii. Monitor the water flow rate to WS-001 once, during each day of operation.
- viii. Monitor the water flow rate to CT-001 once, during each day of operation.
- ix. Monitor the exhaust gas temperature exiting CT-001 once, during each day of operation.
- x. Monitor the differential pressure across CA-001 and CA-002, each, once during each day of operation.
- xi. Monitor the sulfur-impregnated carbon in CA-001 for percentage of mercury by weight, quarterly until reaching 50 percent capacity then monthly until reaching 90 percent.
- xii. Monitor the sulfur-impregnated carbon in CA-002 for percentage of mercury by weight, quarterly until reaching 50 percent capacity then monthly until reaching 90 percent.

c. Recordkeeping

The required monitoring established in Section A.3.b.i through Section A.3.b.xii above shall be maintained in a contemporaneous log containing, at a minimum, the following recordkeeping.

- i. The calendar date of any required monitoring.
- ii. The total daily throughput rate of stripped carbon in tons for TU4.008, for the corresponding date.
- iii. The total daily hours of operation for TU4.008 through TU4.012 each for the corresponding date.
- iv. The corresponding average hourly throughput rate in tons per hour for TU4.008. The average hourly throughput rate will be determined from the total daily throughput rate (ii) and the total daily hours of operation (iii) above.
- v. The throughput rate in gallons per minute of solution of the A-side Pregnant and Barren Tanks (TU4.009 and TU4.011), once during each day of operation, for the corresponding date.
- vi. The throughput rate in gallons per minute of solution of the B-side Pregnant and Barren Tanks (TU4.010 and TU4.012), once during each day of operation, for the corresponding date.
- vii. The findings and dates of the twice per calendar year inspections of the drum on TU4.008.
- viii. The pressure drop in inches of water across WS-001 once, during each day of operation, for the corresponding date.
- ix. The water flow rate in gallons per minute to WS-001 once, during each day of operation, for the corresponding date.
- x. The water flow rate in gallons per minute to CT-001 once, during each day of operation, for the corresponding date.
- xi. The exhaust gas temperature in degrees Fahrenheit exiting CT-001 once, during each day of operation, for the corresponding date.
- xii. The differential pressure across CA-001 and CA-002, each, in inches water column once during each day of operation, for the corresponding date.
- xiii. The percentage of mercury by weight in CA-001, for the corresponding date.



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Section II. Specific Operating Conditions (continued)

A. Thermal Unit #TU4.008 through TU4.012 (continued)

3. Monitoring, Recordkeeping, Reporting, and Testing (NAC 445B.3379.3)

c. Recordkeeping (continued)

- xiv. The depth of the carbon sample location, in CA-001 for the corresponding date.
- xv. The date, time, and weight of each carbon replacement in CA-001.
- xvi. The percentage of mercury by weight in CA-002 for the corresponding date.
- xvii. The depth of the carbon sample location, in CA-002 for the corresponding date.
- xviii. The date, time, and weight of each carbon replacement in CA-002.

d. Reporting

- i. The *Permittee* will promptly report to the Director any deviations from the requirements of the Operating Permit to Construct. The report to the Director will include probable cause of all deviations and any action taken to correct the deviations. For this Operating Permit to Construct, prompt is defined as submittal of a report within 15 days of said deviation. ~~This definition does not alter any reporting requirements as established for reporting of excess emissions as required under NAC 445B.232 and under condition I.L. of this permit.~~
- ii. The *Permittee* shall establish differential pressure operational range values for CA-001 and CA-002, each within 6-months of the notification of implementation of NvMACT for System 61. The operational range values shall be reported to the Director and maintained on site for inspection.

e. Performance Testing

- i. Upon the date of implementation of NvMACT, *the Permittee*, shall begin a performance demonstration period for the establishment of a mercury emissions limit for System 61, which shall consist of (6) consecutive Method 29 source tests at approximate 6-month intervals. The performance demonstration period shall provide emissions data for the establishment of a final NvMACT mercury emission limit for System 61.
- ii. *The Permittee* shall submit a test protocol and receive NDEP protocol approval for each performance demonstration test. Performance tests must be performed at conditions that the Director deems representative of normal operations. Only NDEP-validated tests may be used for the establishment of a final NvMACT mercury emission limit for System 61.
- iii. *The Permittee* shall provide in each validated performance test report the records of all operating parameters and work practice standards required in the Phase-2 Mercury Operating Permit to Construct as monitored and recorded during each corresponding test of performance. Material sampling must be performed pursuant to the NDEP approved protocol.
- iv. Within 30-days of receiving a complete stack test report, the Director shall complete a review of the stack test report and provide written notification to *the Permittee* with determination of applicability for the performance demonstration, pursuant to the NDEP approved test protocol.
- v. The final NvMACT mercury emission limit shall be calculated as the maximum test value from the (6) corresponding NDEP-validated performance demonstration tests plus one standard deviation in gr/dscf mercury. The standard deviation value shall be calculated from the (6) corresponding NDEP-validated performance demonstration test values.
- vi. The final NvMACT mercury emission limit shall be the applicable mercury emission limit permit requirement for the Phase-2 Mercury Operating Permit to Construct expressed as gr/dscf mercury.
- vii. A validated performance demonstration test may be used for the purpose of annual mercury emissions testing.



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Section III. Amendments

July 18, 2013 – Aircase ID 7296: The following modifications have been made:

1. System 67, the chilled secondary condenser (CC-001), the wet gas coalescer, and the heater have been removed. The work practices on the chilled contact condenser have been updated.
2. System 66C, the second venturi scrubber pressure decreased from 12 inches of water to 8 inches of water in the work practice standards and the carbon loading capacity was updated.
3. System 61, the carbon kiln work practices have been updated on the venturi scrubber to specify TU4.008.

January 2, 2014 – Barrick Goldstrike Request Letter dated October 14, 2013: The following language changes have been made:

1. Section II.A.2.a.i: "The A-side Pregnant and Barren Tanks (TU4.009 and TU4.011) and the B-side Pregnant and Barren Tanks (TU4.010 and TU4.012) shall not operate simultaneously" will be removed from the permit.
2. Section II.A.3.b.iii: "Monitor the throughput rate of solution to the A-side Pregnant and Barren Tanks (TU4.009 and TU4.011), once during each day of operation" will be changed to "Monitor the throughput of solution of the A-side Pregnant and Barren Tanks (TU4.009 and TU4.011), once during each day of operation."
3. Section II.A.3.b.iv: "Monitor the throughput rate of solution to the B-side Pregnant and Barren Tanks (TU4.010 and TU4.012), once during each day of operation" will be changed to "Monitor the throughput of solution of the B-side Pregnant and Barren Tanks (TU4.010 and TU4.012), once during each day of operation."
4. Section II.A.3.c.v: "The throughput rate in gallons per minute of solution to the A-side Pregnant and Barren Tanks (TU4.009 and TU4.011), once during each day of operation, for the corresponding date" will be changed to "The throughput rate in gallons per minute of solution of the A-side Pregnant and Barren Tanks (TU4.009 and TU4.011), once during each day of operation, for the corresponding date."
5. Section II.A.3.c.vi: "The throughput rate in gallons per minute of solution to the B-side Pregnant and Barren Tanks (TU4.010 and TU4.012), once during each day of operation, for the corresponding date" will be changed to "The throughput rate in gallons per minute of solution of the B-side Pregnant and Barren Tanks (TU4.010 and TU4.012), once during each day of operation, for the corresponding date."

This permit:

1. Is non-transferable. (NAC 445B.287.3)
2. Will be posted conspicuously at or near the stationary source. (NAC 445B.318.5)
3. Any party aggrieved by the Department's decision to issue this permit may appeal to the State Environmental Commission (SEC) within ten days after the date of notice of the Department's action. (NRS 445B.340)

Signature DRAFT

Issued by: Jonathan McRae, P.E.
Supervisor, Permitting Branch
Bureau of Air Pollution Control

Phone: (775) 687-9337

Date: _____

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