APPLICATION REVIEW

AND DETERMINATION OF CONTINUED COMPLIANCE

FOR:

BARRICK GOLDSTRIKE MINES, INC. WESTERN 102 FACILITY

Storey County, Nevada

HA - 83

Class I Air Quality Operating Permit

AP4911-2189.01

FIN A0016

Air Case #11AP0235 Renewal

BY

STATE OF NEVADA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR POLLUTION CONTROL

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1.0 INTRODUCTION

On February 14, 2011, Barrick Goldstrike Mines Inc. (Barrick) submitted an application for the renewal of their Class I air quality operating permit to the Nevada Division of Environmental Protection - Bureau of Air Pollution Control (BAPC). Based on the December 15, 2006 issuance date of the permit, the Class I air quality operating permit AP4911-2189 expiration date is December 15, 2011. The Class I air quality operating permit application was deemed administratively complete on March 31, 2011.

On September 27, 2011, the BAPC requested additional technical information for a compliance assurance monitoring plan (CAM plan). Barrick submitted the CAM plan on February 10, 2012. On August 24, 2012, the BAPC requested additional technical information for the current insignificant activities (emergency fire pump and a fuel heater), requested a Reciprocating Internal Combustion Engines (RICE) spreadsheet be completed, and requested an emission limit be calculated for the emergency generator. Barrick responded on September 20, 2012. The BAPC reviewed the response from Barrick, which included incorrect emission factors for the emergency generator. The BAPC requested that Barrick resubmit the forms for correct values for the emergency generator over the phone on September 21, 2012. Barrick resubmitted the forms on September 27, 2012. On October 15, 2012, the BAPC requested Barrick resubmit the emergency generator form again due to a issue in converting lb/hp-hr to lb/MMBtu using a conservative value. Barrick resubmitted the forms on October 18, 2012. Because the BAPC had to request additional information that was omitted by Barrick, and because of delays in Barrick's responses, permit review timelines have not been met.

The Standard Industrial Classification (SIC) code for the process is 4911, Electrical Services, described as "*Establishments engaged in the generation, transmission, and/or distribution of electric energy for sale.*" The North American Industry Classification System (NAICS) number is 221112, described as *"Electric power generators, fossil fuel."*

Current emission estimates indicate that the Western102 facility will be a major source (emissions of criteria pollutants are greater than 100 tons/year). The controlled pollutant emissions of PM_{10}, PM, Carbon Monoxide and Volatile Organic Compounds are greater than 100 tons per year each. The facility has not triggered a Prevention of Significant Deterioration (PSD) review due to limiting the emissions to less than 250 tons per year per pollutant. The facility is an Area Source of hazardous air pollutant (HAP) emissions due to limiting the emissions to less than 10 tons per year per HAP and less than 25 tons per year of combined HAPs.

This operating permit will renew the entire facility under Class I Operating Permit AP4911-2189.01.

2.0 DESCRIPTION OF PROCESS

2.1 OVERVIEW

Barrick operates the Western 102 facility located approximately 25 kilometers east of Reno, Nevada, on the south side of the Truckee River at 2555 Waltham Way, McCarran, NV 89434. The facility is located in Hydrographic Basin HA-83, an air management area triggered for PSD increment for NO_x, PM_{10}, and SO_2. The project consists of 14 Wartsila 20V34SG four stroke lean-burn natural gas reciprocating engines that turn generators to develop power and one Detroit diesel emergency generator. Combined gross facility output is estimated at 115 MW.

2.2 PROPOSED PERMIT ACTION

Barrick is proposing to renew their existing permit. The following corrections and additions are proposed in the renewal, and they qualify as trivial or insignificant activities. As such, the corrections and additions are not considered permit modifications.

- Include the diesel emergency generator in the permit and remove off of the non-permit equipment list.
- Update regulations.
- Corrections to the locations of all systems.
- Corrections to stack parameters.
- Remove operating parameter conditions of maximum sulfur content of 100 grains per dry standard cubic foot, because this content is an inaccurate condition of pipeline quality natural gas standards (see 40 CFR Part 72.2, Pipeline Natural Gas definition: "… Pipeline natural gas contains 0.5 grains or less of total sulfur per 100 standard cubic feet").
- Remove and update language for reporting and notification.
- Specify units (dscf) for Compliance/Performance Testing Section VI.A.4.a.(9) of permit.
- Update appropriate emission factor from lb/MMBtu/hr to lb/MMBtu for Section VI.A.4.a.(10) of permit.
- All 15 generators are subject to 40 CFR Part 63 Subpart ZZZZ.
    - 14 Wartsila Four Stroke Lean Burn Engines
    - 1 Diesel Emergency Generator
- CAM requirements were added to System 1 for monitoring NO_x.
- Add surface area disturbance conditions in accordance with Barrick's Dust Control Plan.
- Remove a fuel heater from the non-permit equipment list.

2.3 SYSTEM 1 – 14 WARTSILA NATURAL GAS ENGINES

The 14 Wartsila four stroke lean burn engines use pipeline quality natural gas to produce electricity for various Barrick facilities in Nevada. Each engine has a maximum design output of 11,320 horsepower with a natural gas consumption of 77 MMBtu/hr. The engines are each permitted to operate 8,760 hours per year. The existing pollutants limited in the permit (PM, PM_{10}, SO2, CO, NO_x, VOCs, and Formaldehyde) are calculated using the manufacturer's guarantee. The HAPs excluding formaldehyde are calculated using AP-42.

Each engine has its own selective catalyst reduction (SCR) system for the reduction of NO_x and an oxidation catalyst system for the reduction of CO, VOC and HAPs. The engine computer management system also monitors and manages the SCR to make sure the proper amount of ammonia/urea is fed to the catalyst at proper catalyst bed temperature to achieve the manufacture guaranteed emissions reductions. The manufacturer's guarantee for emissions reductions are: 94% for NO_x, 94% for CO, 79% for VOCs and 97% for formaldehyde.

Because of the well-defined composition and properties of pipeline-quality natural gas, the NOx and CO controls, and the automated systems employed to manage the emissions controls, the BAPC expects low variability in NOx and CO emissions. As such, annual stack testing is sufficient for demonstration of compliance.

2.3 SYSTEM 1 – 14 WARTSILA NATURAL GAS ENGINES (CONTINUED)

To make sure that the engines' controls are always functioning correctly, the BAPC will maintain the permit requirement for the facility to custom-configure the computer systems. The configured system will include an alarm that will sound when either an incorrect catalyst bed temperature or incorrect ammonia/urea injection is detected. The system alarm will sound for up to one hour until an attendant addresses the alarm. If during the one hour period the attendant does not respond or cannot rectify the problem, the affected engine will shut itself off.

The engines are started from a "warm state." A warm state is created by an engine block heater that keeps the engine warmer than ambient temperatures. The warm state prevents thermal stresses associated with cold-starting an engine. The applicant states that the engines will never be cold-started. From a warm start, an engine takes approximately 15 minutes to reach steady-state operation with the emission controls working at their advertised (peak) efficiency. A warm catalyst start occurs when the catalyst is 200°C or hotter. A cold catalyst start occurs when the catalyst is below 200°C. Barrick proposes 420 cold catalyst startups and 1,120 warm catalyst startups per year for all 14 units. This translates to 30 cold catalyst starts and 80 warm catalyst starts per year for each engine. See Table 2.3-1 for how the cold, warm, and steady states are calculated in tons per year for the controlled pollutants (NO_x, CO, VOC, HAPs (excluding Formaldehyde), and Formaldehyde).

Table 2.3-1

Cold Start (15min/hour and 30 starts/yr) + Steady State (45min/hr and 30 starts/yr) + Warm Start (15min/hr and 80 starts/yr) + Steady State (45min/hr and 80 starts/yr) + Steady State (8760 hr/yr-30hr/yr-80hr/yr)

COLD + STEADY STATE (15 mins/hr and steady state 45 mins/hr)							
	15 min/hr	Start/yr	LB/15 MIN	45 min/hr	LB/45MIN	LB/60 min	Starts TPY
NOx	0.25	30.00	4.85	0.75	1.11	5.97	0.089
CO	0.25	30.00	7.94	0.75	1.81	9.75	0.146
VOC	0.25	30.00	2.65	0.75	1.81	4.46	0.067
HAP	0.25	30.00	0.37	0.75	0.15	0.52	0.008
Formald.	0.25	30.00	1.32	0.75	0.11	1.43	0.021
WARM + STEADY STATE (15 mins/hr and steady state 45 mins/hr)							
	15 min/hr	Start/yr	LB/15 MIN	45 min/hr	LB/45MIN	LB/60 min	Starts TPY
NOx	0.25	80.00	3.09	0.75	1.11	4.20	0.168
CO	0.25	80.00	4.85	0.75	1.81	6.66	0.267
VOC	0.25	80.00	1.76	0.75	1.81	3.58	0.143
HAP	0.25	80.00	0.37	0.75	1.48E-01	0.52	0.021
Formald.	0.25	80.00	0.88	0.75	0.11	0.99	0.040

STEADY STATE (8760 hr/yr-Cold and Warm Startups)				**TOTAL**
	hr/yr	lb/hr	TPY	**TOTAL TPY**
NOx	8650.00	1.49	6.43	**6.68**
CO	8650.00	2.42	10.46	**10.87**
VOC	8650.00	2.42	10.46	**10.67**
HAP	8650.00	0.20	0.86	**0.88**
Formald.	8650.00	0.15	0.63	**0.69**

Note: Barrick used the 2010 final Western 102 workbook for the number of startups in a year. Cold and Warm starts are estimated to be 15 min/hr. Differences from the calculated value and requested value are slight rounding errors.

On an annual basis, each engine will be tested for PM, PM_{10}, NO_X, CO, VOC and formaldehyde. SO_2 shall be calculated from the sulfur content in the natural gas through reporting based on grains of sulfur per dry standard cubic foot of pipeline quality natural gas combusted as specified by the fuel supplier. These tests will be used to verify the manufacturer's emission factors and then to create emission factors specific for each engine. On October 19, 2013, the 14 engines will be subject to the requirements of 40 CFR 63, Subpart ZZZZ.

2.4 SYSTEM 2 – EMERGENCY DIESEL GENERATOR

The Emergency Diesel Generator (170 HP) may be used for non-emergency use for up to 500 hours until May 3, 2013 (the date when the generator will be subject to 40 CFR Part 63, Subpart ZZZZ) after which the limit will be 100 hours per year. The design input of diesel for the generator is 1.5 MMBtu/hr. The potential to emit limits were calculated from AP-42 Table 3.3-1 Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines. In this application, Barrick had calculated the values using the factor in lb/(hp-hr) (which were less than the previous calculations (when the unit was an insignificant activity)). The BAPC requested the factors in lb/MMBtu. Barrick calculated the limits using a worst case efficiency of 9,000 BTU/(hp-hr). Therefore, this returned the limit to the original estimation when the unit was an insignificant activity (resulting in no revision).

2.5 INSIGNIFICANT ACTIVITIES

The previous non-permit equipment list included the emergency diesel generator and a fuel heater (<4 MMBtu/hr). The emergency generator is included in the permit renewal. Barrick has indicated that the fuel heater has been removed from use.

3.0 APPLICABLE REGULATIONS

3.1 NEVADA REVISED STATUTES

The Nevada Revised Statutes (NRS) are the current codified laws of the State of Nevada. The NRS is the statutory authority for the adoption and implementation of administrative regulations. The statutes relating to the control of air pollution are contained in Title 40, Public Health and Safety, Chapter 445B, Air Pollution, NRS 445B.100 through NRS 445B.640. The NRS specifies that the State Environmental Commission is the governing body given the power to adopt administrative regulations. Because the NRS is the enabling statutory authority, very few specific requirements are contained in the statutes. Rather, the NRS provides, generally, broad authority for the adoption and implementation of air pollution control regulations. The Western 102 facility will be subject to the NRS and need to comply with all applicable regulations under the NRS. The NRS may be viewed at the following website:
http://www.leg.state.nv.us/NRS/Index.cfm

3.2 NEVADA ADMINISTRATIVE CODE

The Nevada Administrative Code (NAC) contains the regulations that have been adopted by the State Environmental Commission (SEC), pursuant to the authority granted by the Nevada Revised Statutes (NRS), relating to the control of air pollution. The NAC requires that, where State regulations are more stringent in comparison to Federal regulations, the State regulations are applicable. The NAC sets forth, by rule, maximum emission standards for visible emissions (opacity), PM_{10} (particulate matter less than 10 microns in diameter) and sulfur emitting processes. Other requirements are established for incinerators, storage tanks, odors and maximum concentrations of criteria air pollutants in the ambient air. Other NAC regulations specify the requirements for applying for and method of processing applications for operating permits. All the equipment considered in this application must meet, at a minimum, the applicable standards and requirements set forth in the NAC, specifically, the emission standards contained in NAC 445B.22027 through 445B.22033 for particulate matter, 445B.2204 through 445B.22047 for sulfur emissions, 445B.22017 for opacity, and the Nevada Ambient Air Quality Standards as set forth in NAC 445B.310 through 445B.311. The NAC may viewed at the following website:
http://www.leg.state.nv.us/NAC/CHAPTERS.HTMl

3.3 NEVADA APPLICABLE STATE IMPLEMENTATION PLAN

The Applicable State Implementation Plan (ASIP) is a document that is prepared by a state or local air regulatory agency and required to be submitted to the U.S. EPA for approval. Title I of the Clean Air Act is the statutory authority for the U.S. EPA regulations that require a State to submit a ASIP. The contents of the ASIP are intended to show how a state, through the implementation and enforcement of the regulations contained in the ASIP, will either show how attainment of the national ambient air quality standards (NAAQS) will be achieved or how a state will continue to maintain compliance with the NAAQS.

3.4 CODE OF FEDERAL REGULATIONS

The Code of Federal Regulations (CFR) are regulations adopted by the U.S. EPA and published in the Federal Register pursuant to the authority granted by Congress in the Clean Air Act. The CFR addresses multiple aspects, including but not limited to, permitting requirements, performance standards, testing methods, and monitoring requirements. The CFRs may be viewed online at the following website: http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&tpl=%2Findex.tpl

3.4.1 NEW SOURCE PERFORMANCE STANDARDS

Section 111 of the Clean Air Act, "Standards of Performance of New Stationary Sources," (NSPS) requires EPA to establish federal emission standards for source categories which cause or contribute significantly to air pollution. Each NSPS defines the facilities subject to these requirements and prescribes emission limits for specified pollutants, compliance requirements, monitoring requirements, and test methods and procedures. These standards are intended to promote use of the best air pollution control technologies, taking into account the cost of such technology and any other non-air quality, health, and environmental impact and energy requirements. These standards apply to sources which have been constructed or modified since the proposal of the standard. Since December 23, 1971, the Administrator has promulgated 88 such standards and associated test methods. These standards can be found in the CFR at Title 40 (Protection of Environment), Part 60 (Standards of Performance for New Stationary Sources).

Generally, state and local air pollution control agencies are responsible for implementation, compliance assistance, and enforcement of the NSPS. EPA retains concurrent enforcement authority and is also available to provide technical assistance when a state or local agency seeks help. EPA also retains a few of the NSPS responsibilities such as the ability to approve alternative monitoring methods to maintain a minimum level of national consistency.

The 15 generators located at the Western 102 facility are exempt from the requirements set forth under 40 CFR Part 60 Standards of Performance for New Stationary Sources, because their construction and manufacture dates precede the Subpart IIII applicability date of April 1, 2006 (manufacture). All 15 generators were manufactured between March 2005 and July 2005.

3.4.2 FEDERAL NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS

NESHAP for hazardous air pollutants (HAPs) are established in the CFR pursuant to Section 112 of the Clean Air Act Amendments of 1990. These standards regulate air pollutants that are believed to be detrimental to human health. The NESHAP program applies to all sources, both existing and new. These standards are codified in Title 40 CFR Parts 61 and 63.

Part 61, which predates the Clean Air Act Amendments of 1990, includes specific standards, reporting and recordkeeping requirements, and test methods for the initial eight hazardous air pollutants: asbestos, benzene, beryllium, coke oven emissions, inorganic arsenic, mercury, radionuclides, and vinyl chloride. The regulations covering these eight hazardous air pollutants focused on health-based considerations. NESHAPs were established for certain operations that commonly emit the eight hazardous air pollutants.

Other substances were included for consideration due to the serious health effects, including cancer, which may occur from ambient air exposure to those substances. However, no specific restrictions were placed on facilities that used or released these compounds.

Under the Clean Air Act Amendments of 1990, Congress greatly expanded the Air Toxics program, creating a list of 189 substances to be regulated as hazardous air pollutants. Rather than regulating individual pollutants by establishing health-based standards, the new Air Toxics program granted EPA the authority to regulate specific industrial major source categories with NESHAPs based on maximum achievable control technology (MACT) for each source category. Thus, a number of NESHAPs have been established to regulate specific categories of stationary sources that emit (or have the potential to emit) one or more hazardous air pollutants.

NESHAPs may cover both major sources and area sources in a given source category. Major sources are defined as those facilities emitting, or having the potential to emit, 10 tons per year or more of one Hazardous Air Pollutant (HAP) or 25 tons per year or more of multiple HAPs. Major sources are required to comply with MACT standards. Area Sources are defined as those facilities that are not major sources.

The Western 102 facility is an *Area Source* of HAPs. A review of the requirements in 40 CFR Part 63, Subpart ZZZZ, NESHAP for *Reciprocating Internal Combustion Engines (RICE)*, indicates that the 15 generators (Systems 1 and 2) each qualify as an *existing* stationary RICE (construction prior to June 12, 2006), are therefore subject to Subpart ZZZZ operating limitations. The 14 natural gas generators will follow the requirements for an existing non-emergency four-stroke lean burn with horsepower > 500. The diesel emergency generator will follow the requirements for an emergency combustion ignition with horsepower < 300.

The 14 natural gas generators will be required to follow the operating limitations no later than October 19, 2013. Operating and emission limits include maintaining the catalyst for pressure drops, maintaining the temperature exhaust, and limiting CO emissions (Barrick is already complying with this limit of 93% or more reduction). Performance testing includes reducing CO by measuring O_2 and a continuous parameter monitoring system (CPMS) which will continuously monitor catalyst inlet temperature and the catalyst pressure drop. There are testing requirements to limit or reduce CO or formaldehyde. The emergency diesel generator will be required to follow the operating limitations no later than May 3, 2013.

3.4.3 PREVENTION OF SIGNIFICANT DETERIORATION

The Prevention of Significant Deterioration (PSD) permitting program is a Clean Air Act permitting program for new and modified major stationary sources of air pollution. Implementation of the federal PSD regulations is delegated to the State of Nevada by U.S. EPA and these regulations are contained at 40 CFR Part 52.21. Therefore, BAPC implements the federal PSD regulations directly. These regulations specify federally required permitting procedures for each "major stationary source". The PSD regulations define a "stationary source" as "*any building, structure, facility, or installation which emits or may emit any air pollutant subject to regulation under the Act.*" A "building structure facility or installation" is defined as "*all of the pollutant-emitting activities which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, and are under the control of the same person (or persons under common control) except the activities of any vessel. Pollutant-emitting activities shall be considered as part of the same industrial grouping if they belong to the same 'Major Group' (i.e., which have the same first two digit code) as described in the Standard Industrial Classification Manual, 1972, as amended by the 1977 Supplement.*"

"Major" is defined as the potential to emit of a stationary source, which equals or exceeds a specified threshold (in tons per year) of any air pollutant regulated under the Clean Air Act (40 CFR 52.21(b)(1)). The first threshold is for a stationary source that emits or has the potential to emit 100 tons per year or more of any regulated NSR pollutant and is defined as one of 28 specific categories of sources (see 40 CFR 52.21(b)(1)(i)(a)). The other applicability threshold is for any other stationary source that emits or has the potential to emit 250 tons per year of any regulated NSR pollutant (see 40 CFR 52.21(b)(1)(i)(b)).

The Western 102 facility is a power plant which is not one of the 28 listed source categories with a major stationary source threshold of 100 tons per year per pollutant. Thus, the facility has not triggered a PSD review.

3.4.4 COMPLIANCE ASSURANCE MONITORING (CAM) – 40 CFR Part 64

Compliance Assurance Monitoring (CAM) plans are required for major sources required to obtain Title V (Part 70 or 71) permits. The CAM rule was signed on October 3, 1997 and came into effect on November 21, 1997. The U.S. EPA developed the CAM rule to focus on monitoring of certain operating parameters to ensure compliance with emission limitations in-between scheduled source tests. CAM requirements apply to stationary sources that: (1) are equipped with post-process pollutant control devices; (2) have pre-control device emissions equal to or greater than 100% of the major source threshold for a pollutant; and (3) are subject to the Title V permit program.

CAM plans are required with considering potential pre-control device emissions greater than the major source threshold for that pollutant (generally 100 tons per year for criteria pollutants, 10 tons per year for HAPs). CAM plans would normally be required for NO_x, CO, and Formaldehyde due to the uncontrolled values (NO_x and CO being over 100 tons per year and Formaldehyde being over 10 tons per year). Since System 1 is subject to 40 CFR Part 63 Subpart ZZZZ, there are emission limitations for CO and Formaldehyde. Due to 40 CFR 64.2(b)(1)(i) (exempting emission limitations or standards proposed by the Administrator after November 15, 1990 pursuant to section 111 (NSPS) or 112 (NESHAPs) of the Act), CAM plans will be exempt for these emission limits of CO and Formaldehyde. Therefore, only the CAM plans for NO_x will be considered. Barrick proposes the SCR system monitoring approach and Catalytic Oxidizer monitoring approach of installing, calibrating, operating, and maintaining a temperature gauge (SCR catalyst bed for controlling NO_x) and a flow indicator for urea/ammonia.

3.4.5 GREENHOUSE GAS TAILORING RULE

On April 2, 2007, the Supreme Court found that GHGs, including carbon dioxide, are air pollutants covered by the CAA. The Court found that EPA was required to determine whether or not emissions of GHGs from new motor vehicles cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. In April 2009, EPA responded to the Court by proposing a finding that greenhouse gases contribute to air pollution that may endanger public health or welfare. On December 7, 2009, the Administrator signed two distinct findings regarding GHG under section 202(a) of the CAA:

Endangerment Finding: The Administrator found that the current and projected atmospheric concentrations of the six, key, well-mixed GHGs – CO2, CH4, N2O, HFCs, PFCs, and SF6 – threaten the public health and welfare of current and future generations.

Cause or Contribute Finding: The Administrator found that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare.

On December 18, 2008, EPA issued a memorandum, "EPA's Interpretation of Regulations that Determine Pollutants Covered by Federal PSD Permit Program" (known as the "Johnson Memo" or the "PSD Interpretive Memo"). Whether a pollutant is "subject to regulation" is important for the purposes of determining whether it is covered under the CAA permitting programs. The PSD Interpretive Memo established that a pollutant is "subject to regulation" only if it is subject to either a provision in the CAA or regulation adopted by EPA under the CAA that requires actual control of emissions of that pollutant. On February 17, 2009, EPA granted a petition for reconsideration of this memorandum.

On March 29, 2010, the Administrator signed a notice conveying the agency's decision to continue applying the PSD Interpretive Memo's interpretation of "subject to regulation." EPA concluded that the "actual control interpretation" is the most appropriate interpretation. The agency established that CAA permitting requirements apply to a newly regulated pollutant at the time a regulatory requirement to control emissions of that pollutant "takes effect" (rather than upon promulgation or the legal effective date of the regulation containing such a requirement). Based on the anticipated promulgation of the light duty vehicle rule, the notice stated that the GHG requirements of the vehicle rule would trigger CAA permitting requirements for stationary sources on January 2, 2011.

On May 13, 2010, the U.S. EPA issued a final rule that addresses greenhouse gas emissions from stationary sources under the CAA permitting programs. This final rule sets thresholds for greenhouse gas (GHG) emissions that define when permits under the New Source Review PSD and Title V Operating Permit programs are required for new and existing industrial facilities.

Between January 2, 2011 and June 30, 2011 EPA phased in the CAA permitting requirements for GHGs. Only sources currently subject to the PSD permitting program (i.e., those that are newly-constructed or modified in a way that significantly increases emissions of a pollutant other than GHGs) would be subject to permitting requirements for their GHG emissions under PSD. For these projects, only GHG increases of 75,000 tpy or more of total GHG, on a CO_2e basis, would need to determine the Best Available Control Technology (BACT) for their GHG emissions. Similarly for the operating permit program, only sources currently subject to the program (i.e., newly constructed or existing major sources for a pollutant other than GHGs) would be subject to title V requirements for GHG. During this time, no sources would be subject to Clean Air Act permitting requirements due solely to GHG emissions.

3.4.5 GREENHOUSE GAS TAILORING RULE (continued)

The facility wide Green House Gas emissions total about 560,000 tons CO_2e. Because Western 102 is already an existing Title V source, GHG emissions are only considered with any corresponding changes. Therefore, Western 102 will not trigger PSD permitting for GHG under this renewal permit action.

4.0 EMISSIONS INVENTORY

4.1 PROPOSED EMISSIONS

The facility-wide emissions inventory for the Western 102 facility in Table 4.1-1. As can be seen, emissions of PM, PM_{10}, CO, and VOC criteria pollutant are above the BAPC's Class I permit threshold of 100 tons per year. As such, the Western 102 facility qualifies as a Class I major source under BAPC regulations. The detailed emissions inventory for the Western 102 facility is included in Appendix 1. Table 4.1-2 shows the requested Emission Cap values for System 1.

Table 4.1-1
Western 102 Barrick Goldstrike Mines Inc.
Facility Wide Potential to Emit (Class I Renewal, January 2013)

System	Annual PTE (tons/yr)								
	PM	PM_{10}	SO_2	NO_X	CO	VOC	FORMALD.	CO2e	TOTAL HAPS
System 01 - Wartsila NG RICE (14 engines)	158.76	158.76	35.56	93.80	152.32	149.52	9.94	566750	22.4
System 02 - Emergency Diesel Generator	0.117	0.117	0.109	1.660	0.360	0.140	4.43E-04	54	2.00E-03
Total =	**158.88**	**158.88**	**35.67**	**95.46**	**152.68**	**149.66**	**9.94**	**566,804**	**22.40**

Note: The total HAPs are added HAPs including Formaldehyde, Acetaldehyde, Acrolein, Methonal, and N-Hexane. The largest HAP is Formaldehyde which is less than the threshold of 10 tons per year.

Table 4.1-2

Requested Emission Caps (tpy)	
PM	158.76
PM10	158.76
NOX	93.8
CO	152.32
VOC	149.52
SO2	35.56
Formaldehyde	<10

5.0 AMBIENT AIR IMPACT ANALYSIS

5.1 INTRODUCTION/ PURPOSE

The purpose of this analysis is to determine the air quality impacts resulting from operation of the Western 102 facility under the conditions specified in the draft air quality permit.

5.2 CLASSIFICATION OF AIR BASIN

The Western 102 plant is located in Air Quality Hydrographic Basin (HA) 83, the Tracy Segment of the Truckee River Basin. HA 83 has been triggered for PSD increment consumption. Basin 83 was first triggered by the Sierra Pacific Power Company, Tracy Generating Station Pinion Pine Power Generating Project March 11, 1994. The basin is triggered for PM_{10}, NO_x, and SO_2. Two ambient air impact studies are required: one to demonstrate compliance with the Nevada Air Quality Standards (NAAQS), and one to demonstrate compliance with the allowable PSD increment consumption.

5.3 AIR QUALITY MODELING ANALYSIS

5.3.1 AIR DISPERSION MODEL

The BAPC and Air Sciences Inc. (the consultant for Barrick) modeled Western 102's facility for Nevada AAQS compliance in support of their application for renewal. The BAPC used Lakes Environmental's *AERMOD-View* graphical-user interface to input source information, generate receptors, and to actually run AERMOD (v. 12060). Air Sciences Inc. used AERMOD (v. 09292).

5.3.2 AVERAGING PERIODS

The BAPC performed model runs for all criteria pollutants for which there is an air quality standard and a PTE. These included PM_{10} (24-hour, Annual averaging periods), SO_2 (3-hour, 24-hour, and Annual averaging periods), NO_X (Annual averaging period), and CO (1-hour and 8-hour averaging periods). H_2S and Pb emissions were not modeled or included in the application. Ozone impacts were determined using Scheffe screening tables (see below). The Nevada Ambient Air Quality Standards (AAQS) are listed in Table 5.4-1. The PM2.5, 1-hour NOX, and 1-hour SO2 modeling was not performed, because the current permit action does not require PSD review and because BAPC has not yet adopted these standards into its administrative regulations.

5.3.3 SOURCE PARAMETERS

The models included only point sources. Information used in modeling was provided to the BAPC by Air Sciences Inc. All emission sources, receptors, and building locations were modeled in the NAD 83 UTM project datum. AERMOD default options were specified in the *Control Pathway*. For the 14 Wartisla engines, the emission limits of PM_{10} and SO_2 were from the steady state values calculated from manufacturer's guarantee and in the permit. For NO_2, the ton per year value (analysis with cold starts, warm starts, and steady state) was calculated into lb/hr (6.7 tons/year or 1.53 lb/hr). For the CO emission rate, the worst case scenario was used (7.94 lb per 15 minutes or 31.76 lb/hr). For the annual averaging periods, the emergency generator emission limit in lb/hr is calculated from the 500 hours out of 8,760 hours/year. No hour-of-day (HROFDY) scalars were used in the modeling.

5.3.4 RECEPTORS

Plant boundary receptors were spaced at 25 meter intervals, with a proximal, uniform Cartesian receptor array spaced at 50 meter intervals out to a distance of 500 meters from the fenceline, 100-meter spacings out to a distance of 1,000 meters, and 250-meter spacings out to a distance of 5,000 meters. A total of 2,379 receptors were included in the model. No receptors were located inside the plant boundary.

5.3.5 METEOROLOGICAL DATA

Modeling was performed using 2-years (2009 and 2010) of AERMOD-ready meteorological (MET) data collected on-site by Tracy Power Plant. Air Sciences used MET data from 4-years (1998-2001). The raw surface meteorological data (2009 and 2010) was inspected in-house by the BAPC, and it was determined to be acceptable to use for air dispersion modeling purposes. The raw MET data was then processed in AERMET by Redhorse, the consultant tasked with upgrading the BAPC increment tracking system. The BAPC used the AERMET-generated surface and upper air files (.SFC and .PFL files, respectively) to perform modeling in AERMOD. Due to the most recent MET data, BAPC modeled 2009 and 2010 MET years. The year 2009 resulted in higher concentrations for each pollutant modeled.

5.3.6 BUILDING DOWNWASH

The BAPC considered building downwash effects in the air dispersion modeling. The Western 102 facility contains numerous buildings and other structures (storage tanks) that were accounted for using the U.S. EPA BPIPPRIME utility.

5.3.7 TERRAIN

AERMOD requires that elevated terrain be considered in air dispersion modeling analyses. Therefore, elevations were processed in AERMAP using a NAD 27 DEM files for appropriate USGS 1-degree Digital Elevation Model (DEM) files: Reno-w (reno-w.dem). The DEM files were imported from webgis.com. All sources, buildings and receptors were processed in the NAD 83 UTM projection, and AERMAP performed the necessary conversions between the NAD 27 DEM datum and the NAD 83 project datum.

5.3.8 BACKGROUND CONCENTRATIONS

The background concentrations are added to the predicted maximum impacts from the facility. Ambient monitoring data is derived from monitoring conducted in the Reno/Sparks area (2007-2009) and at the Tracy Power Plant. The backgrounds are shown in Table 5.4-1.

5.4 AIR QUALITY IMPACT ASSESSMENT

Results of air dispersion modeling are presented in Table 5.4-1. As can be seen, operation of the Western 102 plant, under the draft permit conditions, will not result in violations of the Nevada AAQS.

5.4 AIR QUALITY IMPACT ASSESSMENT (continued)

Table 5.4-1

Western 102 Plant - Renewal

BAPC Air Dispersion Model - January 2013

Pollutant	AAQS Averaging Period	BAPC Model Met Year	Barrick Model Maximum	BAPC Model Conc.	Backgr. Conc.	BAPC Total Impact	AAQS	BAPC Percent of Standard
			ug/m3	µg/m3	µg/m3	µg/m3	µg/m3	%
PM_{10}	24-hr	2009	30.27	41.88	68.7	110.6	**150**	74
	Annual	2009	2.44	3.45	28	31.5	**50**	63
SO_2	3-hr	2009	22.95	35.2	26	61.2	**1300**	5
	24-hr	2009	6.78	9.38	10	19.4	**365**	5
	Annual	2009	0.55	0.77	4	4.8	**80**	6
NO_2	Annual	2009	1.08	2.04	36.7	38.7	**100**	39
CO	1-hr	2009	2374.83	3737.5	5,142	8,879.5	**40,500**	22
	8-hr	2009	632.44	993.4	4,597	5,590.4	**10,500**	53
O_3	1-hr	N/A	29.42	2.8 (Scheffe)	0	2.8	**235**	1

Note: The BAPC used 2 years (2009 and 2010) of complete on-site surface met data. Formaldehyde was not included in the air dispersion modeling, because ambient air quality standards have not been set at the state or federal levels. Background concentrations are derived from the Reno/Sparks area and at the Tracy Plant.

5.5 OZONE SCREENING

The BAPC performed an assessment of worst-case, potential ozone impacts from operation of the Western 102 plant. Ozone screening was performed using reference tables in the U.S. EPA document entitled, *VOC/NO_X Point Source Screening Tables*, by Richard Scheffe (1986). Based upon the annual PTE for NO_X and VOCs, the BAPC has determined that the 1-hour ozone increment will be 0.0014 ppm, which is only 1% of the AAQS (0.12 ppm). Based on this result, the BAPC believes that continued operation of the Western 102 plant will not result in future exceedances of the AAQS for ozone.

5.6 PSD INCREMENT MODELING ANALYSIS

An increment analysis was performed for HA83 – Tracy Segment to evaluate the impacts of Barrick's Western 102 facility renewal application in the basin. The Nevada Bureau of Air Quality Planning (BAQP) analyzed increment on a paired-in-time basis at each receptor in the HA83 study receptor grid to reflect the permit application by Barrick. Increment impacts were evaluated for NO_x, SO_2 and PM_{10}.

The memo to BAPC from BAQP dated November 6, 2012 presents the results of the HA83 increment analysis of Barrick's renewal application. The tables list all receptors with modeled concentration in excess of the increment standard or the receptors with the highest modeled concentration for each pollutant and averaging period. In addition, the tables list the receptor with the highest modeled contribution attributed to Barrick's application. In summary, emissions due to this renewal do not result in concentrations that exceed the PSD increment standards for $PM_{10,}$ NO_x, or SO_2 in HA83.

7.0 CONCLUSIONS / RECOMMENDATIONS

Based on the above review and supporting data and analyses, operation of the Western 102 plant, under the draft permit conditions, will not result in violations of any applicable ambient air quality standards. Therefore, we recommend that the draft facility wide operating permit be formally issued, with those applicable requirements, conditions, and restrictions contained therein.

Appendix 1 - BAPC Detailed Emission Inventory
Appendix 2 - Draft Class II Air Quality Operating Permit AP4911-2189.01

Jennifer Collier, Staff Engineer I — Date

Jeffrey Kinder, P.E.
Supervisor, Permitting Branch
Bureau of Air Pollution Control — Date