

Final Report

Bingham Canyon Mine Expansion

Notice of Intent Application

Submitted to:
Utah Division of Air Quality

Submitted by:
Kennecott Utah Copper LLC



August 2010
Revised January 2011

Final

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Acronyms and Abbreviations

AERMOD	American Meteorological Society/EPA Regulatory Model
AO	Approval Order
BACT	best available control technology
BCM	Bingham Canyon Mine
CMB	Chemical Mass Balance
CO	carbon monoxide
dscfm	dry standard cubic foot per minute
EPA	U.S. Environmental Protection Agency
FDCP	Fugitive Dust Control Plan
FEL	front-end loader
gr/dscf	grain per dry standard cubic foot
H ₂ SO ₄	sulfuric acid
HC	hydrocarbon
KUC	Kennecott Utah Copper LLC
LPG	liquefied petroleum gas
µg/m ³	microgram per cubic meter
NAAQS	National Ambient Air Quality Standards
NOI	Notice of Intent
NO _x	nitrogen oxide
PM	particulate matter
PM ₁₀	particulate matter less than 10 micrometers in aerodynamic diameter
PM _{2.5}	particulate matter less than 2.5 micrometers in aerodynamic diameter
ppm	part per million
PTE	potential to emit
SIP	State Implementation Plan
SO ₂	sulfur dioxide
SX/EW	solvent extraction/electrowinning

tpy	ton per year
TSD	Technical Support Document
UAC	Utah Administrative Code
UAM-AERO	Urban Airshed Model with aerosols
UAQB	Utah Air Quality Board
UDAQ	Utah Division of Air Quality
VOC	volatile organic compound

1.0 Introduction

1.1 Introduction and Purpose of Notice of Intent

Kennecott Utah Copper LLC (KUC) is submitting this Notice of Intent (NOI) to secure an Approval Order (AO) to increase the annual material-moved limit of ore and waste rock material at the Bingham Canyon Mine (BCM) located near Copperton, Utah. The BCM is currently subject to an annual material-moved limitation of 197,000,000 tons per year (tpy)¹ for ore and waste rock combined. This limit is included in both the current AO for the BCM and the Utah State Implementation Plan. To maintain the current level of metal production, KUC proposes to increase the BCM's material-moved limitation to 260,000,000 tpy during peak years.²

The current material-moved limitation of 197,000,000 tpy contained in the AO for the BCM was permitted by the *Notice of Intent to Increase Annual Ore and Waste Rock Production at the Kennecott Utah Copper Bingham Canyon Mine* (KUC, 1999), resulting in an AO being issued in 1999. The current AO for the BCM was issued in 2008 by the Utah Division of Air Quality (UDAQ), AO DAQE-IN0105710023-08 (UDAQ, 2008). Condition 21.A of the 2008 AO includes the material-moved limit established in 1999, stating that the "total material moved (ore and waste) shall not exceed 197,000,000 tons per 12-month period" (UDAQ, 2008).

In addition to the AO, the 197,000,000-tpy material-moved limitation is contained in the Utah State Implementation Plan. A material-moved limitation was first included in the 1994 federally approved Utah State Implementation Plan (SIP) for particulate matter (PM) less than 10 micrometers in aerodynamic diameter (PM₁₀) and, like the AO limitation, was increased in 1999 to the currently authorized limitation of 197,000,000 tpy by order of the Utah Air Quality Board (UAQB) as provided for by the 1994 SIP. In 2005, the UAQB approved substantial changes to the PM₁₀ SIP. Consistent with the 1999 authorization, the 197,000,000-tpy material-moved limitation for the BCM was carried forward into the 2005 PM₁₀ SIP. The 2005 SIP, as approved by the UAQB, was submitted to the U.S. Environmental Protection Agency (EPA); however, the EPA has not taken final action on that submittal. In fact, EPA has largely proposed its disapproval.³

Given the inclusion of the material-moved limitation in the AO and the SIP, this NOI requests that UDAQ (1) issue a modified AO authorizing the increase to 260,000,000 tons, and (2) initiate a rulemaking action through the UAQB to increase the material-moved limitation contained in the 2005 state-approved SIP.

¹ Throughout this NOI, the material-moved limitation is expressed on a "tons per year" (tpy) basis; however, it is more accurately expressed on a "tons per 12-month" basis.

² The actual total amount of material moved is expected to range from current levels to the maximum of 260,000,000 tpy depending on the year. For permitting purposes, including the ambient air quality analyses, the maximum amount of 260,000,000 tpy is assumed.

³ The EPA published its intent to disapprove the 2005 PM₁₀ redesignation request and SIP revisions on December 1, 2009 (74 *Federal Register* 62717). In the proposal, the EPA does propose to approve several minor aspects of the 2005 SIP.

This NOI includes an air quality modeling demonstration performed using American Meteorological Society/EPA Regulatory Model (AERMOD) modeling to support the increase in material moved. AERMOD is an EPA-approved model that predicts ground-level concentrations of PM₁₀. The results from AERMOD demonstrate that the changes at the BCM (increasing the material moved limitation to 260,000,000 tpy) will not cause or contribute to an exceedance of the PM₁₀ National Ambient Air Quality Standards (NAAQS).

In addition to the AERMOD modeling demonstration, KUC has assessed the implications of the proposed increase on the attainment and maintenance demonstrations, which were relied upon in supporting the 1994 and 2005 PM₁₀ SIP actions. The Chemical Mass Balance (CMB) receptor model, in conjunction with emission control and offset requirements, was used in support of the 1994 SIP attainment and maintenance demonstration. The Urban Airshed Model with aerosols (UAM-AERO) was used in support of the 2005 SIP demonstration. Accompanying this NOI is a Technical Support Document (TSD) providing technical demonstrations that the proposed increase in the total material-moved limitation will not adversely affect attainment and maintenance of the PM₁₀ NAAQS based on the demonstration methodologies employed for the 1994 PM₁₀ SIP and 2005 Maintenance Plan.

1.2 Initiatives to Reduce Emissions

Since 1999, KUC has initiated a number of business improvement projects to proactively reduce PM emissions and reduce emissions of nitrogen oxide (NO_x) and sulfur dioxide (SO₂). These improvement projects are summarized as follows.

1.2.1 Fugitive Dust Control

The reduction of dust is an ongoing part of operations at the BCM and other KUC plants. This is accomplished through various means, including watering roads and revegetating. KUC also uses chemical dust suppressants and water haultrucks to suppress dust at the mine. KUC submits a Fugitive Dust Control Plan (FDCP) report annually to UDAQ that describes dust control measures completed at the BCM every year. The FDCP is an effective mechanism to control emissions in a dynamic industrial environment such as the BCM. The FDCP also includes water applied to the haulroads. To further enhance watering of the haulroads, KUC recently added two new 50,000-gallon water trucks at the cost of approximately \$5,500,000. Additionally, KUC plans to add three new 50,000-gallon water trucks at the cost of approximately \$6,000,000 in the near future.

Since 2005, KUC has added a crushing and screening unit to crush aggregate material for use as road base on the unpaved haulroads. The application of road base material assists in reducing fugitive dust emissions from haulroads.

KUC has one of the longest and widest conveyors in the world, which transfers ore within the mine. Ore transfer via conveyors reduces fugitive and tailpipe emissions in comparison with the ore transport with haultrucks.

1.2.2 Mine Haultruck Idling Management Project

To help manage fuel costs, reduce emissions, and improve emissions output, KUC is working to reduce idling time for BCM haultrucks while maintaining a safe and productive work environment. This project is ongoing.

1.2.3 Transition to Ultra-low Sulfur Diesel Fuel

KUC has used on-road specification diesel fuel for 20 years in its off-road equipment. In 2007, an EPA ruling required sulfur content in all on-road specification diesel fuels be reduced (from 50 parts per million [ppm] formerly to 15 ppm currently). Because KUC uses only on-road specification diesel fuel in its equipment, KUC also made a transition to ultra-low sulfur diesel fuel. All of KUC's diesel-powered equipment now runs on ultra-low sulfur diesel fuel, which has led to a decrease in the BCM's SO₂ emissions (a precursor to PM₁₀).

1.2.4 Larger Haultrucks

In recent years, KUC has purchased newer haultrucks with higher capacity where possible, which has led to a decrease in the round-trips and vehicle miles traveled, thereby reducing fugitive dust emissions.

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