June 28, 2010

Air and Radiation Docket and Information Center,
Environmental Protection Agency, Mail code: 2822T,
1200 Pennsylvania Ave., N.W.
Washington, DC 20460

Attention: Docket ID No. EPA–HQ–OAR–2010–0239.

Thank you for the opportunity to comment on the proposed mercury air emission regulations for gold and silver processing facilities. These comments are submitted on behalf of EARTHWORKS, Great Basin Resource Watch, Montana Environmental Information Center, The Lands Council, The Spokane River Keepers, Rivers Without Borders, Friends of the Kalmiopsis, Friends of Great Salt Lake, Defenders of the Black Hills and Save Our Sky Blue Waters.

EARTHWORKS is a nonprofit organization working to protect communities and the environment against the adverse impacts of hardrock mining.

We commend the Environmental Protection Agency for initiating this important rule-making to develop MACT standards for gold and silver processing facilities. Given the significant public health effects related to mercury exposure, and the very large amounts of mercury released by some gold and silver mines, the development of federal MACT standards is an important step in reducing mercury air emissions from this industry.

Earthworks has a number of comments on the proposed rule which are listed in greater detail below, but I would like to highlight our most significant concern.

The emission limits for pretreatment for new mines is set the same as the pretreatment emission limits for existing operations, and it would allow an unacceptably high level of mercury to be released into the air. For example, the proposed pretreatment emission limit (149 pounds/million ton) would allow the Donlin Creek Mine, proposed in southwest Alaska (at 22 million tons per year), to release more than 3,200 pounds of mercury into the atmosphere per year. This is 40 times more than the amount of mercury that is currently released into the air by all industries in

Alaska![1] And, this does not account for the amount of mercury that will be released by other mine processes at Donlin.

We are particularly concerned that these emission limits are not protective of public health, particularly the subpopulations in the U.S. that consume higher than average amounts of fish. The Donlin Creek mine is an important example. This mine is located in the Kuskokwim River watershed, and the communities there rely on a subsistence diet high in fish – consuming up to 699 pounds of non-salmon fish species a year.[2] The impact from additional mercury loading in this region is particularly troublesome given that the Kuskokwim River supports one of the largest subsistence fisheries in Alaska and Alaska Natives in the region rely on subsistence fishing for approximately 60% of their diet.[3]

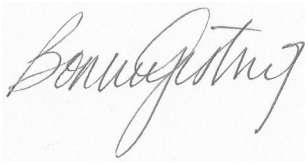
Mercury concentrations in fish tissue are already an issue in this region due to historic mercury mining. Thus, new sources of mercury air pollution are particularly a concern. According to a 1997 study of mercury concentrations in fish provided by subsistence fishermen who live in the lower Yukon-Kuskokwim Delta, 16 of 66 fish contained mercury above the "level of concern" established by the Environmental Protection Agency." Overall, 24% of the fish exceed the critical value for human consumption and 58% the wildlife critical value.[4]

Mercury exposure is a tremendous public health concern, particularly for children. Exposure to mercury can cause significant neurological and developmental problems such as attention and language deficits, impaired memory and impaired vision and motor function.

We urge the EPA to make changes in the draft regulations to better protect public health from existing and new sources of mercury air emissions. Our detailed comments on this element and other elements of the rule-making are below.

Thank you for considering our comments. With these comments, we also reference comments submitted by Center for Science and Public Participation, Northern Alaska Environmental Center and Solutions Statistical Accounting.

Sincerely,



Bonnie Gestring

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[1] U.S. EPA, Toxic Release Inventory (TRI) data for 2008 – the most recent data available for all industries. The total point source and fugitive mercury air emissions for Alaska for all industries is 71 pounds.

[2] Verbrugge, Lori, for the State of Alaska, Division of Public Health, Fish Consumption Advice for Alaskans. October 15, 2007.

[3] Alaska Community Action on Toxics & Reducing Environmental Destruction on Indigenous Lands, "Mining and Toxic Metals: A case study of the proposed Donlin Creek mine,"*citing* Alaska Department of Fish and Game, Division of Subsistence, 2001, Alaska Subsistence Fisheries–1999 Annual Report at 154 (2001).

[4] Duffy et al. "Regional health assessment relating to mercury content of fish caught in the Yukon-Kuskokwim Delta rivers system." Alaska Med. 1998 Oct-Dec; 40 (4):75-7, 89.

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Compliance Testing and Monitoring Requirements Should Be Strengthened

Compliance Testing:

The proposed rule provides for mercury emissions compliance testing only once a year. One testing event a year has no statistical significance. It does not provide for accurate, timely or credible information, or provide accountability to the public.

The severity of this problem is illustrated by the recent situation at the Twin Creeks mine in Nevada, where significant uncontrolled emissions occurred from the carbon kiln due to a failure in the control equipment - the hypochlorite scrubber. The equipment failure wasn't identified until the annual emissions test.[5]

Similarly, the Jerritt Canyon mine has failed to operate and maintain pollution control devices for a significant period of time, resulting in excess emissions and failure to report those excess emissions.[6] This problem wasn't confirmed until the annual emissions testing event occurred – at least a full year later.

> "A meeting with Queenstake held on August 24, 2004, and again on December 15, 2005, focused on maintenance issues and problems with the reporting of excess emissions and other permit deviations. During an inspection in October 2005, the NDEP discovered evidence that leaks in ore processing equipment in the dry mill building appeared to have been generating excess emissions (the facility was not operating at the time of the inspection). While inspecting the facility during mercury emissions testing in October 2006. NDEP inspectors confirmed that the generation of fugitive emissions from leaky processing equipment is a recurrent problem. During one of the October 2006, test runs, Queenstake suspended operation of the West Roaster in order to repair major leaks in the ore grinding process system. In December 2006, based mainly on the inspections conducted in October 2005 and 2006, the NDEP issued five Notices of Alleged Violation (NOAVs) to Queenstake for failing to maintain ore processing equipment, which resulted in excess emissions and deviations from permit conditions, and for failing to report these

[5] Nevada Department of Environmental Protection, Stakeholder Meeting, October 7, 2009.
[6] Nevada Department of Environmental Protection, Notice of Findings and Order No. 2008-13.

> excess emissions. These NOAV's resulted in total penalties of $2,600 and were approved by the State Environmental Commission."[7]

This is a serious failure in the system, particularly given the amount of mercury air emissions generated by the Jerritt Canyon and Twin Creek mines. The Twin Creeks mine is currently the largest single source of mercury air emissions in the U.S., with 1,837 pounds of mercury released into the air in 2008.[8] Jerritt Canyon was the largest single source of mercury air emissions for many years in the 1990s.

NDEP is now requiring Jerritt Canyon to conduct *monthly* emissions tests on its roaster for a four-year period.[9]

> "Queenstake shall conduct emissions tests for mercury and sulfur dioxide (SO2) on a monthly basis following restart of each roaster circuit."

Additional compliance tests are economically feasible. Newmont reported net income of $546 million and Barrick Gold reported a net income of $758 million for the *first quarter* of 2010.[10]

Compliance emission tests should occur on a quarterly basis, at a minimum. A more stringent compliance emissions testing regime is necessary to provide the public, regulatory agencies, and the industry greater accountability – particularly to address company's which fail to operate and maintain equipment properly, and fail to provide accurate information on emissions, controls, faulty equipment, etc.

Mass Balance Regime:

Because of the potent toxicity of mercury and the threat it poses to human health, it's essential that the mine facilities be able to account for mercury at all stages of mine operations. Full accountability for the flow of mercury at regulated units is a feasible and appropriate part of the program, and can be accomplished at minimal cost.

The rules should incorporate a mass balance approach, such that all facilities are required to provide data to fully account for mercury in all product and waste streams at regulated units. It is also critical that the mercury captured by emissions controls are appropriately managed and stored over the long term.

A mass balance approach will provide detailed information on mercury throughout the process. This approach is warranted because mercury air emissions from gold mines have been significantly and repeatedly under-reported.[11]

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[7] Nevada Department of Environmental Protection, Notice of Findings and Order No. 2008-13, March 10 , 2008. Finding # 3, page 2.
[8] U.S. EPA Toxic Release Inventory, 2008.
[9] NDEP, Notice of Findings and Order No. 2008-13a. Order #7.
[10] http://www.marketwatch.com/story/newmont-mining-profit-surges-as-gold-prices-rise-2010-04-27 http://finance.yahoo.com/news/Barrick-Gold-1Q-profit-more-apf-3885572195.html?x=0&.v=6

Although the Toxic Release Inventory has required mines to report mercury air emissions since 1998, some mines repeatedly have failed to test and report emissions from all emissions sources. For example, the Lone Tree Mine failed to measure and report emissions from numerous mine units over many years. In its response to the 2006 NDEP questionnaire, the Lone Tree Mine reported that mercury is released into the air from many of the mine's major facilities, yet the company claimed that the amount of emissions from those sources were "unknown."[12] Similarly, the Twin Creeks Mine failed to test its Juniper Mill and Solution Tanks until 2005, revealing mercury air emissions from this unit of 142.79 pounds.[13]

Some mines have repeatedly used old stack test data to calculate new emissions, resulting in serious discrepancies.[14] For example, mercury emissions from the carbon kilns and combustion stacks at the Gold Quarry Mine increased six-fold when 2005 stack test results were used to calculate 2005 emissions, rather than the 2001 stack test data used to calculate the four previous year's emissions.[15] Thus, changes in mercury ore content were simply not measured and reported in a timely fashion.

In 2006, Earthworks and other NGOs filed a series of notices of intent to sue in relation to mercury air emission reporting under TRI.[16] In response, some companies undertook additional mercury emissions analysis, and submitted new FORM R's, with significantly higher reported mercury emissions.[17]

As a result of repeated monitoring and reporting problems, there is simply no accurate information for how much mercury was released into the air over the last decade. The point of this section is not to rehash these problems, but to demonstrate that a comprehensive system is needed to identify significant discrepancies in a timely manner. A mass balance approach is needed to provide for better management of mercury at mine sites, and to provide better accountability to regulators and the public.

Fugitive Emissions:

The proposed regulations fail to require monitoring of fugitive mercury air emissions – a significant source of mercury air emissions at some mines. Recent research conducted by Mae Gustin at the University of Nevada, Reno found that mercury air emissions from mining disturbances are approximately 20 percent of the total mercury emitted at the two gold mines

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[11] Great Basin Mine Watch, Earthworks and Idaho Conservation League. "Three Nevada Gold Mines Grossly Under-Report Mercury Air Emissions" August 2006.
http://www.earthworksaction.org/publications.cfm?pubID=166
http://www.earthworksaction.org/publications.cfm?pubID=258
http://www.earthworksaction.org/publications.cfm?pubID=165
[12] Ibid.
[13] Ibid.
[14] Ibid.
[15] http://www.earthworksaction.org/publications.cfm?pubID=166
[16] http://earthworksaction.org/pubs/Florida_Canyon_Notice%20letter.pdf
[17] Letter from Jim Butler at Parsons, Behle and Latimer in Response to Notice of Alleged TRI Mercury Release Reporting Violations, October 3, 2006.

studied, with total nonpoint emissions at Twin Creeks of 105 kg/year (231 pounds/year) and Cortez Pipeline Mine of 19 kg/year (41 pounds/year). This is not an insignificant amount.

While we certainly recognize that direct monitoring of fugitive emissions may be difficult to do, these emissions can't simply be ignored. The regulations should provide a standard set of calculations to estimate fugitive emissions, and mines should be required to incorporate this information into their monitoring reports.

Continuous Emissions Monitoring:

We support continuous emissions monitoring (CEM) as an important component of the federal MACT program. Given the significant volume of mercury air pollution released by roasters, it is critical that regular monitoring be employed to ensure that equipment is operating appropriately, and problems can be addressed rapidly.

CEM should be incorporated into the compliance regime as well. The EPA should develop the parameters based on achieving the efficiency levels described below. Given the toxicity of mercury, and the significant volume of mercury air emissions from these mines, it is essential that the public and regulatory agencies know that these mines are in compliance at all times. If the monitoring results indicate that the mine is consistently out of compliance for a period of one week, without correction, the mine unit should be subject to compliance-based penalties and/or shut down until corrections are made, and the mine is back in compliance.

Of note, CEM does not replace the need for quarterly stack tests. The quarterly stack testing must also be conducted to demonstrate that the CEM is working.

Emissions limits for existing and new sources should be strengthened.

Ore Pretreatment Emission Limits: Roasters and Autoclaves

The proposed regulations for new and existing sources provide a single emission level for all ore pretreatment processes, lumping autoclaves and roasters into a single category. Although they accomplish the same end goal, these two processes are so different that different mercury species are released and different controls utilized. Importantly, the processes produce very different *rates* of mercury emissions. (See CSP2 comments attached).

The two processes produce vastly different levels of mercury emissions, particularly when proper controls are utilized. According to Appendix D of the "DEVELOPMENT OF THE MACT FLOORS AND MACT FOR THE PROPOSED NESHAP FOR GOLD MINE ORE PROCESSING AND PRODUCTION," roasters at Goldstrike emit on the order of 10^{-5} lbs of Hg/ton of ore while autoclaves emit on the order of 10^{-7}, a difference of two orders of magnitude.

Facilities that use autoclaves solely, as the proposed Donlin mine in Alaska will likely employ, should not be allowed the leeway to emit at the rate that facilities employing roasters are allowed. The EPA should develop and incorporate into the rules separate emission limits for roasters and autoclaves for existing and new sources.

Emission Limits – Developing MACT Floor

CAA Section 112 (d)(3) provides direction for establishing emissions standards for existing sources, based on the average emissions limitation achieved by the best performing five sources. The emission limits for pretreatment at existing mines relies on data from five mining operations, including facility D (the Twin Creeks mine), which reports more than twice the amount of emissions as the next largest emitter. The Twin Creeks Mine does not represent a "best performing" source, given the significant discrepancy between its emissions and the other four facilities. In fact, the Twin Creeks mine will see the large mercury air emission reductions (686 pounds of mercury) as a result of the proposed regulations,[18] which indicates that it is currently the worst performer.

Twin Creeks is clearly an outlier in this dataset, and should be eliminated from the statistical analysis because it biases the data and prevents the agency from calculating a technically defensible emission limit.

In fact, we would ask the EPA to take a different approach. The EPA has interpreted "best performing source" to refer to the mine processing facility that has the overall best removal of mercury emissions. However, a facility is not a single "source" but rather consists of many sources. Thus, the five best performing ore pre-treatment sources are the best performing five autoclave complexes (i.e., autoclave (s) and control technology that vent to a single stack) and also the best performing five roasters or roaster sets that vent to single stacks. This is a better approach in defining the best performing pretreatment sources, because even individual mines can have a number of different pretreatment complexes, with varying levels of control performance. In this approach, the MACT floor would be based on averaging the emission levels based on the five best-performing sources as listed here:

Five Best Autoclave Complexes (vented to a single stack) From MACT technical memo, Appendix A.

Facility	Unit	Avg of 3 runs (lb/ton)
Goldstrike	Autoclave	3.80E-07
Goldstrike	Autoclave	5.90E-07
Goldstrike	Autoclave	6.60E-07
Goldstrike	Autoclave	9.00E-07
Lone Tree	Autoclave	6.40E-05

The same approach should be used to calculate it for roasters, as described in the CSP2 comments.

[18] Memo from Chuck French to Heidi King, "Interagency Comments under EO 12866 on the gold ore processing NESHAP Draft NPM, 4/12/2010.

Thus, EPA should revise the MACT floor calculation and emissions limit for pre-treatment processes from existing sources without the emissions from Facility D included in the calculation. In fact, the MACT floor calculation for roasters and the MACT floor calculation for autoclaves should be based on identifying and averaging the emissions from the five best performing sources as described above.

Emission Limits - Statistical Analysis – Confidence Intervals

We also encourage the EPA to revisit its use of 99% confidence intervals in developing these emissions limits. This approach places far too much emphasis on setting the emission limits so low that the industry can meet them with little effort, rather than setting more stringent emission limits that better protect the public. A 95% confidence interval is a more appropriate approach.

Emission Limits – Pretreatment Processes – New Sources

The emission limits for new sources are set at the same level as existing sources; it allows for unacceptably high mercury air emissions; and it contrasts with the mining industries stated ability to achieve higher efficiency levels.

Under the draft rule, the proposed Donlin Creek mine in Alaska will be allowed to emit up to 3,200 pounds of mercury per year from its pre-treatment processes alone,[19] not including the amount that could be released from other mine facilities (i.e., the carbon processes). This is considerably larger than the emissions from the nation's largest existing source of mercury air emissions, the Twin Creeks Mine, which released 1,837 pounds of air emissions (stack and fugitive) in 2008 – the most recent year available in the Toxic Release Inventory.

Furthermore, total mercury air emissions for all industrial facilities in Alaska is 71 pounds. The amount that would be authorized for Donlin under the new permit – just for pretreatment – would exceed the total emissions in Alaska by a factor of 40!

The emissions limit for pretreatment processes in the proposed rule for new sources is the same as the emissions limit proposed for existing sources -- 149 pounds/million tons of ore. This goes against the intent of the Clean Air Act, and EPA's standard practice for setting emission limits for new sources at a more stringent level. The CAA contemplates that new and existing sources will have different emissions limits. CAA §112(d)(3) requires that:

> The maximum degree of reduction in emissions that is deemed achievable for **new sources** in a category or subcategory shall not be less stringent than the emissions control that it achieved in practice by **the best controlled similar source** . . . Emissions standards promulgated under this subsection for **existing sources** in a category or subcategory may be less stringent than standards for new sources in the same category or subcategory but shall not be less stringent . . . than . . . the average emissions limitation achieved by

[19] According to the company website, Donlin will process 59,000 tpd, or roughly 22 million ton of ore per year. http://www.donlincreek.com/project_description/overview.php The new regulations would authorize 149 pounds/million tons of ore.

the best performing 5 sources.

Thus, the emission standard for pretreatment processes for new sources should be based **solely** on the emissions control achieved at the **single best performing source.**

The EPA has interpreted "best performing source" to refer to the mine processing facility that has the overall best removal of mercury emissions. However, a facility is not a single "source" but rather consists of many sources. Thus, for ore pre-treatment, the best performing source should be based on the best performing autoclave complex that vents to a single stack and the best performing roaster complex that vents to a single stack. This is a better approach in defining the best performing pretreatment sources, because individual mines can have a number of different pretreatment complexes, with varying levels of control performance. In this approach, the emission limit for new sources should be based on the average emission limits from Autoclave 1 at the Barrick Goldstrike Mine – the best performing autoclave complex.

Goldstrike	Autoclave	3.80E-07

And, the best performing emission limit for new sources for roasters should be based on the average emissions from the best roaster complex – the Gold Quarry Roaster.

Gold Quarry	Roaster	9.00E-07	7.00E-07	7.90E-07	
Gold Quarry	Roaster	1.30E-06	1.60E-06	6.20E-07	9.80E-07

New Sources Emission Limits - Variability

In the proposed rule, the starting point for the new source emissions limit for pretreatment processes is 62 pounds/million tons of ore. However, the proposed rule includes a variability calculation that increased the emissions limit by **over** 250%, to 163 lb/million tons of ore. Even after EPA applies "beyond the floor" requirements to the limit for new sources, the proposed limit (149 lb/million tons) is still almost 200% higher than what is achieved by the best performing source (Facility A), and is in fact considerably higher that the emissions control achieved by the best performing **four** sources.

While the EPA can consider variability in establishing the emissions limit, an emissions limit that is 250% higher than the emissions achieved by the best controlled similar source eviscerates the CAA requirement that emissions limits for new sources "*shall* not be l*ess stringent* than the emission control that is achieved in practice by the *best* controlled similar source." CAA §112(d)(3).

Furthermore, that a great deal of variability may be <u>statistically</u> conceivable if EPA chooses a high enough prediction limit (in this case the 99th percentile) does not mean that a well run source actually would experience such variability. Indeed, one of the main points of having emission standards is to ensure that sources not only deploy the appropriate control measures but use those control measures consistently to minimize emissions.

Citing dicta in a D.C. Circuit decision, industry groups have argued that EPA must set weak standards to accommodate sources' worst reasonably foreseeable performance. *See Sierra Club v. EPA*, 167 F.3d 658, 665 (D.C. Cir. 1999). Those dicta have no precedential value, and do not bind EPA's rulemaking in any way. Further, even if they constituted a holding – which they do not – they do not apply to EPA's floors for existing sources. Moreover, the underlying assumption – that if a particular standard reflects what a given source achieves in practice, that source will never violate the standard – is plainly flawed. No matter what level a given source normally achieves in practice, that source may emit far higher levels if it is not run properly. For example, if a careless operator allows a combustion unit to operate outside the proper parameters for temperature and pressure, its emissions may increase. Likewise, if a baghouse is not properly maintained or the pressure drop is allowed to exceed the proper parameters, emissions may increase.

The high emissions that occur when a source is poorly operated should violate emission standards, even though it is "foreseeable" that periods of sloppy or negligent operation may occur even at the source with the lowest emission tests. Floors should not be set at a level that the best performers could never exceed even when they operate poorly or fail to maintain their control equipment. Indeed, such an approach violates § 112(d)(3) and frustrates its intent. Floors must be set at the average emission level achieved by the best performers when they are operating properly – i.e., in the way that identified them as the best performers. Using an upper prediction limit to set standards reflecting the statistical worst performance these sources could have does not yield an accurate picture of the best sources performance, and it is especially arbitrary in the absence of any explanation of why EPA thinks that the relevant best sources' performance would ever be so bad, other than the fact that it is statistically possible.

Indeed, Barrick Gold, the company proposing the Donlin Creek Mine, reports on its website and in its NDEP questionnaire that its Goldstrike mine in Nevada is able to achieve 99.5 % efficiency.

> "Barrick has installed state-of-the-art mercury reduction controls on most of its mercury emission sources. For example, the mercury controls on Goldstrike's new $330 million roaster, are more than 99.5 percent efficient." Excerpted from the Barrick Gold website at http://www.barrick.com/CorporateResponsibility/KeyTopics/MercuryManagement/default.aspx

The draft EIS for the Genesis project (Newmont) states that Newmont's South Operations (Gold Quarry primarily) has achieved a 99.89 percent removal of mercury through their emission controls at the roaster and carbon regeneration.[20]

As an alternative to the throughput-based only emission limit, we request that the EPA develop an efficiency-based emission limit as well that reflects a minimum of 99% mercury removal. If the emission limits are set based entirely on throughput rates (pounds of mercury per million tons of ore processed), the EPA is discounting the mercury concentrations in the ore as an important

[20] U. S. BLM, *Draft Environmental Impact Statement, Genesis Project,* BLM/NV/EK/ES-10/13+1793, pg. 3-26, February, 2010.

and relevant factor.

Mines that have lower mercury concentrations in the ore won't be held to the same level of emissions control as mines with high mercury concentrations in the ore. The MACT standard should require every mine to fully employ the *maximum* achievable control technology, regardless of the mercury concentration in the ore.

This can be accomplished by developing and incorporating a stringent efficiency based emission limit as a component of the MACT standard for existing and new ore pretreatment processes, and requiring the mine to meet the throughput-based emission limit or the efficiency-based emission limit, whichever is more stringent.

It is technically and economically feasible to collect and track information on mercury grade, just as gold mines collect and track gold grade information. The previous two examples demonstrate that the industry can collect the appropriate data and calculate efficiency rates for these pretreatment processes.

The EPA should develop and incorporate a MACT standard for new sources that is more stringent than existing sources, and based on the best performing autoclave source (Barrick Goldstrike Autoclave 1) and the best performing roaster source (Gold Quarry roaster). It should develop and incorporate an efficiency level into the MACT standard that the industry has stated that it can achieve at its best source (i.e. > 99%). The regulations should incorporate an efficiency based emissions limit in conjunction with the throughput based emission limit, and require mines to meet whichever emission limit is more stringent, similar to the approach used with carbon processes.

Emission Limits – Carbon Processes

The proposed emission limits for carbon processes are based on data collected from the Round Mountain Mine.[21] Round Mountain was chosen as a "best controlled" similar source based on its emission rate. However, the Round Mountain emission rates are lower because the mercury content of the ore is quite low. We believe the Marigold Mine represents a more appropriate "best controlled" similar source because it reportedly represents a more significant mercury removal efficiency level.

Using post control Marigold data from 2007-2009, an average mercury reduction efficiency level of 99.995% was achieved.

2006 0.162 lbs/hr - no carbon control
2007 9.12e-6 lbs/hr (99.994 % reduction)
2008 1.3e-5 lbs/hr (99.992 % reduction)
2009 9.33e-7 lbs/hr (99.9994 % reduction)

average reduction - 99.995 %

[21] US EPA, Development of MACT Floor, Table 4, page 10

Thus, the EPA should use the Marigold Mine capture efficiency rate of 99.995% for the carbon processes efficiency-based emission limit.

Operational Changes

The proposed MACT standard should also incorporate changes identified in CAA 112 (d)(2)(A) by reducing the volume of, or eliminating emissions of, such pollutants through *process changes*, substitution of materials *or other modifications*, (d)(2)(B) enclose systems or processes, and CAA 112 (d)(2)(C), which identifies measures of mercury reduction obtained through the *collection*, capture of treatment of pollutants when released from a process, stack, storage of fugitive emissions point.

> CAA 112 (d)(2) (2) Standards and methods.- Emissions standards promulgated under this subsection and applicable to new or existing sources of hazardous air pollutants shall require the maximum degree of reduction in emissions of the hazardous air pollutants subject to this section (including a prohibition on such emissions, where achievable) that the Administrator, taking into consideration the cost of achieving such emission reduction, and any non-air quality health and environmental impacts and energy requirements, determines is achievable for new or existing sources in the category or subcategory to which such emission standard applies, through application of measures, processes, methods, systems or techniques including, but not limited to, measures which - (A) reduce the volume of, or eliminate emissions of, such pollutants through process changes, substitution of materials or other modifications, (B) enclose systems or processes to eliminate emissions, (C) collect, capture or treat such pollutants when released from a process, stack, storage or fugitive emissions point, (D) are design, equipment, work practice, or operational standards (including requirements for operator training or certification) as provided in subsection (h), or (E) are a combination of the above.

Presently, many mines dispose of some of the mercury captured by the facility's pollution control devices into the tailings pond(s), where the mercury can volatize back into the atmosphere. For example, at the Twin Creek Mine, the autoclave exhaust gas containing the vaporized mercury is contacted with a solution in the Venturi wet scrubber which adsorbs particulates including particulate mercury, thus removing it from the exhaust gas. This spent solution is then transported to the tailings pond.[22]

At the Jerritt Canyon Mine, the effluent tank collects the discharge from the mercury scrubber, and the contents are sent to the CIL Tank #6 and then disposed into the tailings pond.[23] The air emissions from the water bath condensers from the retort furnace also ultimately end up in the tailings impoundment.

> Effluent Tank

[22] Twin Creeks Application for Mercury Air Quality Permit to Construct, January 2008. page 3-13.
[23] EPA, Waste Management Division RCRA Enforcement Office Jerritt Canyon Final Report 5-6, Sept. 13 & 14, 2007.

> The effluent tank in the bottom of the roaster building collects the discharge from the SO2, Mercury, and Tail Gas Scrubbers. The contents of the effluent tank are sent to the CIL Tank #6 and then disposed into the tailings pond. The EPA sample (SP-1J) of the contents of the effluent tank indicated a concentration of 26.6 (mg/l) of mercury.
>
> Envirocare Scrubber Unit
> The air emissions from the water bath condensers from the Retort Furnace flow from the quench unit and then through the Envirocare Scrubber unit. According to Jerritt representatives, the Envirocare Scrubber underflow is approximately 20 gallons per minute and flows into the "acid wash" sump and then to CIL Tank #6 and then to the tailings impoundment. EPA sampled the liquid scrubber effluent from the Envirocare Scrubber (SP-5J) and found concentrations of mercury at 57.4 mg/l.

Similarly, the wastewater from mercury scrubbing at the Gold Quarry mine is released into the tailings impoundment.[24]

> The wastewater from mercury scrubbing located adjacent to the sulfuric acid plant exhibited the RCRA characteristic toxicity for mercury. This wastewater is discharged to the tailings impoundment.

New research demonstrates that fugitive emissions (e.g., wet heaps and tailings impoundments) are a significant source of mercury air emissions at some mines.[25] Furthermore, some of these mines, such as Jerritt Canyon, Lone Tree and Twin Creeks have leaky tailings impoundments.[26] Thus, tailings impoundment disposal of mercury is particularly inappropriate because the mercury can volatize or "off-gas" back into the atmosphere and it can create a long-term direct source of contamination to groundwater.

The MACT standard should require the mines to collect the mercury captured from the pollution control devices, and provide for the long term **enclosure** of this mercury where it can not be released back into the environment.

Other "beyond the floor" technologies should be considered:

Autoclaves:

The draft regulations evaluate the potential for adding an additional adsorber to carbon processes to achieve additional mercury emissions reductions, and then reject it based on a cost benefit analysis. The draft regulations do not evaluate the potential mercury emission reductions

[24] US EPA, Notice of Violation, Newmont Gold Mine. May 2, 2008.
[25] Eckley, CS; Gustin M, Miller MB and Marsik F, "Fugitive Mercury Emissions from Nevada USA Gold Mines, Powerpoint presented to the Fugitive Mercury Emissions Oversight Committee, Nevada Department of Environmental Protection, and available at http://ndep.nv.gov/mercury/new.htm
[26] Kuipers, Jim P.E. and Ann Maest PhD, Comparison of Predicted and Actual Water Quality at Hardrock Mines. December 7, 2006. Pages 150 and 153.

achieved with an additional adsorber on autoclaves, particularly on new sources. The proposed regulations should evaluate the mercury emission reductions based on the installation of a second adsorbtion system for existing and new sources – including Donlin. The draft regulations estimate an additional 90% reduction if a second adsorber were added to carbon processes. An additional 90% reduction on autoclave emissions for existing and new sources would be significant.

Once again, the industry can well afford additional control technology. Newmont reported net income of $546 million and Barrick Gold reported a net income of $758 million for the *first quarter* of 2010.[27] It simply isn't appropriate to authorize a new source of mercury emissions that could release thousands of pounds of mercury. New sources need to be held to a higher standard.

Roasters:

The draft regulations propose "beyond the floor" technology for autoclaves, but it is completely silent on additional control technology for roasters.

> To evaluate opportunities for emission reductions beyond those provided by the MACT floor, we typically identify control techniques that have the ability to achieve an emissions limit more stringent than the MACT floor. Facilities with ore pretreatment processes have installed calomel scrubbers and venturi scrubbers on their roasters and autoclaves, respectively, to achieve the MACT floor for ore pretreatment processes. To achieve further reductions in mercury beyond what can be achieved using calomel scrubbers and venturi scrubbers, we identified as a beyond-the-floor option the installation of both a refrigeration unit and a carbon adsorber on autoclaves.[28]

The draft rules provide no rationale for why additional controls were not considered. Given the significant emissions from this pretreatment process, the rules should evaluate additional controls for roasting facilities. EPA has a statutory obligation to ensure that its new source standards reflect the maximum achievable reduction in emissions. By failing even to consider such a standard, EPA violates the Clean Air Act.

Fugitive Emissions:

The regulations do not consider technology that may reduce fugitive mercury air emissions. The regulations should evaluate the use of sulfur based complexing agents, such as dimethyldithiocarbamate or diethyldithiocarbamate, for removing mercury during cyanidization of gold. Research indicates that these products appear useful for substantially reducing mercury

[27] http://www.marketwatch.com/story/newmont-mining-profit-surges-as-gold-prices-rise-2010-04-27
http://finance.yahoo.com/news/Barrick-Gold-1Q-profit-more-apf-3885572195.html?x=0&.v=6

[28] US EPA, Development of the MACT Floor and MACT for the Proposed NESHAP for Gold Processing Facilities, April 14, 2010. page 10.

in process solution during heap leaching, and thereby significantly reducing the amount of mercury released over time.[29]

Stringent Mercury Air Emission Regulations are Necessary to Protect Public Health and Wildlife.

The gold industry accounts for a significant portion of national mercury emissions, but emissions from this category of sources also continue to present "a threat of adverse effects to human health or the environment" and warrant regulation under § 112(d) of the Act. 42 U.S.C. § 112(c)(3). Uncontrolled mercury air emissions have resulted in significant existing and ongoing harm to the public and to the environment.

A 2007 study by Dr. Glenn Miller found high ambient air mercury concentrations around a number of Nevada gold mines.[30] The report expressed concern for high mercury concentrations measured downwind from some processing facilities, "These concentrations were much higher than expected and approach concentrations where impacts to worker health and safety, particularly to women of child bearing age, should be assessed."

A significant number of fish consumption advisories have been issued in areas downwind of the Nevada gold region.

> Idaho: Fish consumption advisories have been issued for five southern Idaho water bodies: American Falls Reservoir, Salmon Falls Creek Reservoir, CJ Strike Reservoir, Lake Lowell and Brownlee Reservoir.
>
> Utah: Fish consumption advisories for mercury have been issued for Calf Creek, the Green River in Desolation Canyon, East Fork Sevier River, Joe's Valley Reservoir, Jordanelle Reservoir, Lower Ashely Creek Drainage and Stewart Lake, Mill Creek, Gunlock Reservoir, Newcastle Reservoir, Pine Creek, Porcupine Reservoir, Red Fleet Reservoir, Rock Creek below Upper Stillwater Reservoir, Sand Hollow Reservoir, Steinaker Reservoir, Silver Creek, Upper Enterprise Reservoir, Utah Lake and Weber Lake.
> http://www.fishadvisories.utah.gov/health_risks.htm
>
> Nevada: The State of Nevada recently posted fish consumption advisories for the following water bodies: Lahontan Reservoir and Carson River; Little and Big Wahoe Lake; Rye Patch Reservoir; Chimpney Dam Reservoir and Comins Lake. (see http://ndow.org/fish/health/) In addition, the data show significantly more water bodies contain fish with tissue concentrations exceeding EPA's 0.03 ppm methylmercury risk-based consumption limit. Indeed virtually ever species of fish tested in northern, western and eastern Nevada from 2005-2008 exhibited mercury levels well in excess of the 0.03 ppm consumption limit.

[29] Glenn Miller et. al. "Use of sulfur based complexing agents to remove mercury from processing fluids during cyanidization of gold ore."
[30] Dr. Miller, Mercury Air Concentrations in Northern Nevada: Monitoring Active Metal Mines as a Source of Mercury Air Pollution, January 2007.

(http://ndow.org/fish/health/mercury_results.pdf) For example, rainbow trout from northeast Nevada's Wild Horse Reservoir (which lies within about 50 miles of major gold mining areas) had an average methylmercury level of 0.14 ppm, and Walleyes had an average mercury level of 0.64 ppm.

In addition, the State of Utah has issued waterfowl consumption advisories for three species of ducks,[31] which migrate through the Great Salt Lake system, and pick up mercury from the consumption of brine shrimp in the lakes. The Great Salt Lake is considered one of the most important inland shorebird sites in North America (see attached comments by Western Resource Advocates). Nevada gold mines are a likely contributing source of mercury to the Great Lake system, given that they are the largest, closest source of mercury air emissions. This is an additional exposure pathway, which should be identified in the public health supporting document. These ducks migrate great distances, and information is simply not available to most hunters along their migratory route.

Mercury exposure is an issue for a large number of children in the U.S. According to a 2005 study, somewhere between 317,000 and 637,000 of the 4 million children born each year in the United States are exposed in the womb to mercury levels above the Environmental Protection Agency's safety level.[32] Children of women exposed to relatively high levels of methylmercury during pregnancy show delayed onset of walking and talking, reduced neurological test scores, and delays and deficits in learning ability. Research indicates that the health effects related to mercury have substantial economic consequences, which should be incorporated into this section. The report states that diminished intelligence of children exposed to mercury contamination before birth costs the U.S. economy $8.7 billion a year in lost productivity.[33]

EPA's failure to set emission standards for all the hazardous air pollutants that gold mines emit is unlawful.

Clean Air Act § 112(c)(1) and § 112(c)(3) require EPA to list all categories of major sources of hazardous air pollutants and some categories of area sources of hazardous air pollutants for regulation under § 112(d). 42 U.S.C. §§ 7412(c)(1), (3). Section 112(c)(6) establishes an additional requirement: EPA also must "assur[e]" that categories accounting for ninety percent of the aggregate emissions or mercury and certain other especially toxic hazardous air pollutants are listed. 42 U.S.C. § 7412(c)(6). Section 112(c)(6) provides the public with extra protection from the exceptionally toxic hazardous air pollutants that it enumerates by requiring EPA to ensure that sources accounting for at least ninety percent of the pollutants it enumerates are subject to highly protective emission standards required by § 112(d)(2) or (d)(4), regardless of whether they are major sources or minor sources.

Section 112(c)(6) expressly provides that EPA must "list categories and subcategories of sources assuring that sources accounting for not less than 90 per centum of each [enumerated] pollutant are subject to standards under subsection (d)(2) or (d)(4) of this section." 42 U.S.C.

[31] http://www.waterfowladvisories.utah.gov/
[32] Trasande, Leonardo et al. Public Health and Economic Consequences of Methylmercury Toxicity to the Developing Brain. February 2005.
[33] Ibid.

§ 7412(c)(6). As the D.C. Circuit has held repeatedly, when EPA sets standards for a category or subcategory of sources under § 112(d)(2), it has a clear statutory duty to set emission standards for each hazardous air pollutant that the sources in that category or subcategory emit. *E.g.*, *National Lime Ass'n v. EPA*, 233 F.3d 625, 633-634 (D.C. Cir. 2000). Thus, when EPA sets standards for gold mines under § 112(d)(2) – as § 112(c)(6) requires it to do – the agency must set § 112(d)(2) emission standards for all the hazardous air pollutants that gold mines emit.

§ 112(c)(6) unambiguously requires EPA to issue § 112(d)(2) standards for the "sources" in the categories listed under § 112(c)(6), not some subset of the pollutants that those sources emit. As noted above, it is well established that § 112(d)(2) standards must include emission standards for each hazardous air pollutant that a source category emits. Nothing in the Clean Air Act exempts EPA from this requirement just because the category at issue is an area source category listed pursuant to § 112(c)(6) instead of a major source category listed pursuant to § 112(c)(1). Had Congress wished to give EPA discretion to set standards for only some of the pollutants emitted by a category listed under § 112(c)(6), it would have done so expressly. *See New Jersey v. EPA*, 517 F.3d 574, 582 (D.C. Cir. 2008) (EPA could not avoid delisting requirements of § 112(c)(9) just because a source category was listed under § 112(n)(1) instead of § 112(c)(1)).