

**SUPPLEMENTAL EIS  
RESPONSES TO COMMENTS**

**AIR QUALITY**

Air Quality .....	AIR-1300
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**AIR-1300 Air Quality**

1. *Any serious study of geology reveals that a single major volcanic eruption can inject more contamination into the atmosphere than the collective aggregate of human activity in all of earth's history for the past 10,000 years. (S3460)*

Response: A study of geology would reveal the problems that would occur with a major volcanic eruption would be tremendous. However, everyday source emissions are controlled. The department has established rules and regulations that a source must comply with to ensure that human health and the environment are protected during operations. Sterling has met the necessary requirements to be issued an air quality preconstruction permit from the department.

2. *Prevent adverse effects to air quality. Pollution of air could occur in greater ways than assured ... address how it could adversely affect air quality in the Cabinet Wilderness area. (S3701)(S3707)(S3971)*

*Asarco will be allowed to proceed only after eliminating any potentially adverse effects to air quality in the Cabinet Mountains Wilderness area. Ventilation of the mine itself and dust caused by mining operations will degrade the pure air quality of the wilderness area. (S614)(S5092)(S6412)*

Response: The air quality preconstruction permit issued for the Sterling Rock Creek project estimates the potential emissions from the site. The emission controls are discussed in Chapter 4. Also, the modeling analysis that was submitted demonstrated compliance with the ambient air quality standards. These demonstrations and requirements will allow Sterling to achieve emission levels that protect human health and the environment.

3. *On page 4-179, the SEIS states "Even after compliance with applicable state and federal ambient air quality and emission standards, there would be some minimal air quality degradation associated with the project." The agencies should define minimal degradation. If the air quality will no longer be Class I, what will it be? (S614)(S5092)(S6312)*

Response: Sterling has demonstrated compliance with the applicable rules and regulations required by a source to be granted an air quality preconstruction permit. As stated, there would be some minimal air quality degradation associated with the project; however, that would not be considered a violation of the federal or state Clean Air Acts as long as there is compliance with the applicable regulations. Some amount of degradation is allowed under the Acts. This degradation does not mean that the classification of the wilderness will change.

4. *The wilderness ventilation adit is an extraordinary obtrusion on a wilderness area, and sets a dangerous precedent. Because the SDEIS and related documents did not consider ventilation mechanisms that allowed this adit to be dispensed with, the document is seriously flawed. Suitable arrangements of interior duct work can fulfill the ventilation needs without the wilderness adit. S4185)*

Response: The need for the ventilation adit in the wilderness would be determined some years into mine operation based on Mining Health and Safety Administration (MSHA) inspection. The agencies would work closely with Sterling to determine other reasonable means of resolving mine ventilation issues identified by MSHA. See Chapter 2, Alternative III description, Mine Plan, for more detail.

5. *A plan to monitor the air at the mine at all times would be appropriate. Please describe the air monitoring program that Asarco will implement? (S614)*

Response: The proposed air monitoring plan is described in Appendix K. The required ambient and emission monitoring would be the responsibility of Sterling. Quality assurance and data validation

procedures would be used and reviewed by the agencies. Violations of standards would be addressed through compliance and enforcement procedures.

6. *The Forest Service and DEQ should: For the purposes of baseline monitoring, expand the air quality study area to include the portion of the Cabinet Mountains Wilderness affected by the proposal (including the ventilation adit site); conduct baseline and on-going ambient air quality monitoring for particulate and gaseous pollutants in the Cabinet Mountains Wilderness; require ASARCO to include in their air monitoring program, that portion of the Cabinet Mountains Wilderness affected by the proposal (including the ventilation adit site); and require ASARCO, in their air monitoring program, to employ the "minimum tool principle" for all sampling within the Wilderness boundaries. (S161)*

Response: The baseline monitoring required of a source was completed and approved by the department prior to issuance of the original preliminary determination of the air quality preconstruction permit. The proposed air monitoring plan that will be required by Sterling is described in Appendix K and Appendix C. The proposed monitoring plan is similar to the ambient air monitoring required by other similar sources.

7. *On page 4-8 the SEIS states "Most underground mobile equipment would be electric powered." These changes are commendable, but the agencies should define "most." Is this going to be a permit condition? Why can't Asarco use exclusively electric powered equipment underground? A fully electric fleet of underground vehicles would result in even greater air pollutant reductions. Page 2-50: Electric underground ore trucks must be operating permit conditioned, to preclude the operator from abandoning this aspect and reverting to underground diesel operating equipment that would violate air quality permit conditions and make working conditions in the mine that more hazardous to the health and safety of miners. (S614)(S6312)*

*The permit fails to establish a condition which requires the use of electric motors for the equipment in the mine which ASARCO assumes will be powered with electricity rather than diesel engines as the basis for showing lower NOx emissions. (S6326)*

Response: Sterling has proposed to use electric ore haul trucks in Alternative V but other underground vehicles such as loaders and drill rigs would use low-emission diesel engines. The source is required to operate at or below the allowable emissions calculated as part of the permitting process. If Sterling makes any changes that would increase potential emissions, an air quality preconstruction permit change would be needed, and if an alteration is required a public notice would be completed. The information submitted by the applicant has demonstrated compliance with the ambient air quality standards and compliance with all applicable rules and regulations required to obtain an air quality permit. Underground mine worker related air quality issues are regulated by the Mine Safety and Health Administration and the Montana Department of Labor and Industry.

8. *Page 1-13. "ASARCO must obtain a burning permit from the DNRC area office in order to burn slash or other material." Is burning covered in the air quality appendix (appendix J)? (S3462)*

Response: Depending on what type of material is being burned and the amount of material to be burned Sterling may need an air quality open burning permit from the department. An air quality open burning permit issued by the department is separate and distinct from the air quality preconstruction permit that Sterling has currently applied for. A source is only required to obtain air quality open burning permit at the time they will be burning. The open burning permit issued by the Montana Department of Natural Resources and Conservation would be a fire control burn permit and would not be included in Sterling's air quality preconstruction permit.

9. Page 2-50: Last paragraph: Where are the data that substantiate the claims of reduced emissions? How much reduction will occur? Will emissions be reduced in the Rock Creek adits to levels safe for mine workers? Use of electric ore trucks sounds good, but what about ozone generation underground, re worker safety? Who will monitor the use of vehicles once mine is operating? Will not ASARCO be free to do as it sees fit? (S3462)

Response: The potential emissions from Alternative V, which show a reduction in emissions from Alternative II are described in Chapter 4, Air Quality. Underground mine worker related air quality issues are regulated by the Mine Safety and Health Administration and the Montana Department of Labor and Industry.

10. Page 3-6 Table 3-1 I take note that the concentration of TSP at the mill site is already greatly in excess of the area at Highway 200. What does this mean? In an area relatively distant from any human activity, the TSP is higher from that of the an area with known pollutants - emissions from vehicles and woodsmoke from residences and any industry in the area downslope from the mill site? Does this make sense? Has anyone verified that an area near the wilderness boundary has more TSP than an area we know has more from vehicles, etc.? If no one is hiding anything why hasn't there been an explanation for lay person that TSP's are higher in a remote area than from a highly used area? The same applies to the lead concentrations measured at the proposed mill site and Highway 200. Does this make intuitive sense? Have the data been verified? A footnote reads "annual averages for the mill site are based on partial year data." Is this the discrepancy? What portions of the year are lead and TSP emissions higher in a remote setting than along a highway? (S4832)(S4833)

Response: Chapter 3 describes the baseline monitoring values. Normally one would expect the emissions from an active area, such as near a road or residences, to be higher than in a remote setting. However, the results do not indicate this to be true for this case and the department does not have information to explain this situation. There could be several reasons for this, either the monitors picked up particulate that is naturally occurring as pollen, or there could have been particulate in the air from forest fires/slash burning that may have been occurring during the partial year monitoring at the mill site. In any case, the baseline monitoring that was required was submitted by the applicant and accepted by the department.

11. Page 2-69 para. 2 & 3 The hydrogen sulfide and other odiferous gases given off by the bio-treatment process need to be addressed as an air quality nuisance. (S614)

Response: The issue of potential odor from possible bioreactor systems is difficult to address because the impact can not be quantified. With the types of odorous emissions possible (reduced sulfur compounds and amines) the perceptibility of individuals varies. The biotreatment system under Alternative V is different than that under Alternatives II-IV and would more likely generate less odor.

12. Page 3-5 "Wind measurements were not made at the proposed plant site." This statement is indicative of the kind of hit and miss baseline data gathering that has been done throughout this project proposal. This seemingly insignificant oversight is very important in the light Troy inspection reports dated July 13, 1983-Sept. 23, 1987 indicating in every instance that when inspectors were around, the milling facility was not operational, and reports that Asarco would blow out the mill bag houses late at night under cover of darkness. (S614)

Response: The baseline monitoring required was submitted and approved. Air quality inspections are typically done on an unannounced basis. A positive effect of this is that facilities are not able to alter conditions in anticipation of the inspection. A negative effect is that sometimes portions of facilities are not in operation. The primary means of measuring air quality compliance at Troy was visual observation. While that was not possible during some of the inspections at Troy, secondary crusher and milling operations were not reported to be an air quality problem at Troy by any of the other agency personnel that were on the site at various times over the years. Some additional

monitoring measures which would be required at the Rock Creek Project are described in Appendix K, as well as the testing required by the air quality preconstruction permit in Appendix C.

*13. Page 4-5 The CMW is a Class-I airshed, there should be no distinction made about air in the mine being of a lower quality. Just like a mining claim having extralateral rights to a vein of ore extending beyond its boundaries, it can also be entertained that an area with Class I air has extralateral rights to any air within its boundaries, including underground, if it is within those boundaries. (S614)*

Response: The federal and state Clean Air Acts specifically regulate “ambient” air with respect to air pollution impacts. Ambient air is defined as that portion of the atmosphere, external to buildings, to which the general public has access. While the correlation of the inside of a mine to a building may be questioned, it is clear that the general public does not have access inside the mine.

Underground mine worker related air quality issues are regulated by the Mine Safety and Health Administration and the Montana Department of Labor and Industry.

*14. NOx emissions from the adit. development phase will violate both Class I and Class II increments, and the Montana 1-hour MQS. The mine operation does not qualify for an exclusion from increment consumption based on the rules applicable to temporary sources.*

*Emissions from the proposed operations can be expected to cause or contribute to violations of the Montana 1-hour AAQS and the Class I PSD increment for NOx:*

*Use of the values calculated by ASARCO in Appendix 1 "Computation of Deposition Loss in Mine" for estimating the amount of NOx emitted in the mine that would be deposited before release from the evaluation adit. to the atmosphere would result in total NOx emissions sufficient to cause the PSD increment for a Class I area to be violated at the wilderness boundary.*

*Use of values calculated by ASARCO in Appendix 1 for estimating the NOx emitted from the mine adit. would also be sufficient to cause the Montana 1-hour AAQS to be violated at the permit boundary.*

*NO2 concentrations resulting from operation of the propane generators at the evaluation adit. site during the development phase would be sufficient to violate the Montana 1-hour AAQS.*

*NO2 concentrations at the boundary of the evaluation adit site reported in the permit application as resulting from operation of the propane generators during the adit. development phase would be sufficient to violate the Class II NOx increment at the site boundary (35.14 p/m<sup>3</sup> vs. 25 ,u/m<sup>3</sup>).*

*NO2 concentrations reported in the permit application resulting from operation of the propane generators during the adit. development phase probably violate the Class I increment at the wilderness boundary (35.14 p/m<sup>3</sup> vs. 2.5 p/m<sup>3</sup>) which is only 0.5 km from the adit. development site, but the expected concentrations at the wilderness boundary are not reported by ASARCO. (S6326)*

*NOx Emissions Reported for Evaluation Adit. Development Phase Exceed Class II Increment. Table 4.3 reports that NOx concentrations will be 35.14 ~g/m<sup>3</sup> "occurring on or outside the Rock Creek permit boundary." Technical Support Document, 4.4.1, p. 4-6. This calculation is presumably based on over one year of emissions from the propane generators at this site. See May 28 letter, Lockhard to Driscoll, Issue 2. The PSD increment for a Class II area is 25 11g/m<sup>3</sup> Thus emissions reported by ASARCO will exceed this increment.*

*In a conversation with Division staff, CRG was informed that the Division does not interpret the propane generator emissions as consuming increment because they are considered "temporary" sources. However, the Montana PSD rule 16.8.928 excludes from increment consumption only "(c) concentrations of particulate matter attributable to*

*the increase in emissions from construction or temporary emission-related activities," or "(d) concentrations attributable to the temporary increase in emission of sulfur dioxide, particulate matter, or nitrogen dioxide from stationary sources which are affected by revisions of the state implementation plan, approved or conditionally approved by EPA, provided that: (ii) such temporary increase in emissions does not impact a Class I area or an area where an applicable increment is known to be violated or cause or contribute to the violation of a national or Montana ambient air quality standard."*

*NOx emissions from the Rock Creek project do not qualify under any of these exclusions. First, the exclusion for temporary emissions from construction applies only to particulate matter. Second, the exclusion for temporary increases of NO<sub>2</sub> is available only for a source subject to a SIP revision approved by EPA, and under no circumstances would such an exclusion be available to a source that would cause an exceedance of the Class I increment. Here, there is no SIP revision and emissions from the propane generators would be expected to cause the Class I increment to be exceeded at the wilderness boundary. See discussion of Class I increment below.*

*Furthermore, the NOx emissions from the project are not temporary. NOx emissions are expected to be released from the evaluation adit for over thirty years. In fact, once the corrections are made to account for improper calculation of in-mine deposition, the emissions from the adit will remain nearly constant after the transition from mine development to mine operation. The fact that the propane generators will be replaced by propane heaters and diesel equipment after 1.5 years does not mean that the source has changed. The source is the mine operation which will be continuous. The source is not just the individual pieces of equipment operated at the site which may change from time to time. To treat the equipment generating the emissions, rather than the mine operation, as the permitted source, would mean that the mine could always be considered temporary as long as the individual pieces of mining equipment were changed every two years. This would defeat the purpose of the Act and would not, therefore, be a permissible interpretation of the rule.*

*ASARCO reports that propane generators NOx emissions will produce one-hour concentrations of 865 ~g/m<sup>3</sup>. Using the conversion method submitted by CRG in 1996 to convert modeled NO<sub>2</sub> concentrations reported as ~g/m<sup>3</sup> to ppm for comparison with the Montana AAQS (see 1996 Comments, p. 2), the one hour concentrations exceed 0.50 ppm compared to the AAQS which is 0.30 ppm. ASARCO avoids this result by applying the ozone limiting technique to the conversion for compliance with the MAAQS. At the same time, ASARCO uses the EPA guidance method for converting to compare with the NAAQS. No explanation is provided regarding the use of EPA's guidance method for one standard but not the other. CRG asks that the same technique be used for both, and that the EPA guidance method be used because it represents the state of the science. The federal guidance method must also be used to satisfy federal requirements for approval of mine plan of operations on federal lands.*

*Using 16.3 tpy as the annual emissions from the evaluation adit during mine operations, ASARCO modeled NO<sub>2</sub> concentrations at the wilderness boundary of 1.74 ~g/m<sup>3</sup> compared to the Class I increment of 2.5 ~g/m<sup>3</sup>. However, during the mine development phase, NOx emissions are expected to be 34.7 tpy (Table 3.1), and during the production phase NOx emissions are expected to range from 33 tpy to 42 tpy, depending on the corrections made to account for the miscalculation of deposition rates, the overestimation of NO<sub>2</sub> formation in the mine and the excessive, unjustified adjustment for load factor. All these emission rates exceed by more than a factor of two the emissions modeled to determine the NO<sub>2</sub> concentration at the Class I boundary. At a minimum, NO<sub>2</sub> concentrations at the wilderness boundary will be double the modeled concentrations, or at least 3.5 ~g/m<sup>3</sup>. These concentrations during all phases of the mine operation exceed the Class I increment by 40% or more.*

*The Division asserts in its draft permit analysis that Montana does not construe its SIP as requiring the consumption of increment for this operation. CRG adopts the position taken by EPA on this issue in the comment letter from Richard Long, May 22, 1996. CRG asks that the Division apply the rules consistent with this construction of the CAA. Furthermore, the CAA provides protection for Class I areas from the cumulative impact of all sources that add emissions to those areas. It is not permissible for the State to defeat the protection intended for Class I areas by not counting the emission increases from some sources.*

*If the same adjustment is made to the modeled 1-hour concentrations of NO<sub>2</sub> to account for increased NO<sub>x</sub> emissions during the production phase as is discussed in C, then it appears that the NO<sub>2</sub> concentrations at the permit boundary will slightly exceed the 1-hour MAAQS of 0.30 ppm. (S6326)*

Response: The applicant has proposed to use add-on NO<sub>x</sub> controls on the temporary propane generators and will be required to continuously use the controls by the air quality permit in Appendix C. Sterling submitted modeling and the department approved the modeling in which the temporary propane generators demonstrated compliance with the Ambient Air Quality Standards and the Prevention of Significant Deterioration (PSD) increments. The results of the modeling can be seen in Chapter 4, Air Quality, of the final EIS.

*15. NO<sub>x</sub> emissions reported by ASARCO in the permit application from the evaluation adit, during mine production phase, have been understated by more than half compared to emission rates derived from a correct calculation using the emission factors and in-mine deposition rates provided by ASARCO.*

*NO<sub>x</sub> emissions are also unreasonably understated by overestimating NO<sub>2</sub> formation in the mine and by adjusting emissions based on excessive and undocumented load factors. (S6326)*

*The use of correct emission rates in the modeling analysis would demonstrate violations of the PSD Class I increment for NO<sub>x</sub> at the boundary of the Cabinet Wilderness Area and the Montana MQS at the permit boundary. (S6326)*

*In addition, the permit application does not adequately address impacts the project will have on air quality related values in the Class I area. The opportunity for public comment and final action by the agencies on the permit and the mine plan of operations may not be taken until these deficiencies are corrected by adequate analysis using corrected emission projections, including:*

*NO<sub>x</sub> concentrations less than half of the values obtained by applying the calculation method reported by ASARCO were used to assess impacts of emissions on air quality related values in the Class I area, including visibility impacts and lake chemistry effects. The results obtained using these low estimates of emissions are not valid and may not be relied upon for making determinations required by NEPA or Clean Air Act § 165(d) and (e).*

*The assessment of the impact project emissions are expected to have on visibility in the Class I area were based on separate assessments for emissions from each of the three emission-generating areas of the project, i.e., the evaluation adit, mill site, and tailings disposal V load out areas, but no assessment was performed for wind directions that could result in cumulative impacts on visibility from the combined plumes of these three areas of the project.*

*Finally, if the agencies issue a permit and approve a mine plan of operations despite these objections, the permit must at least contain conditions requiring ASARCO to operate emission controls as described in the permit application. Not required by the draft permit is the use of electric motors to power most mining equipment. Despite the fact that the Revised Preliminary Determination identifies the use of "electric underground mining equipment" as accounting for 60% reduction of mine emission reductions, the permit does not require the implementation of this emission control technique. The number of diesel-powered units that may be used in the mine at any one time should be expressly limited by the permit to ensure that the use of electric equipment is an enforceable obligation of the permit. (S6326)*

*In reporting emissions of NO<sub>x</sub> from blasting, diesel fuel combustion and propane combustion in the mine, ASARCO uses a deposition rate which assumes that only 38.7% of the NO<sub>x</sub> emitted in the mine will be released to the atmosphere. The application claims that this deposition rate is computed in Appendix I. See p. 3-3. However, Appendix I reports much lower deposition rates for NO<sub>x</sub> emissions. Appendix I states:*

## VOLUME IV

Assuming that 10 percent of the NO<sub>x</sub> emissions inside the mine are NO<sub>2</sub> and the remaining 90 percent is NO, the deposition velocities for each component of NO<sub>x</sub> are computed separately. For NO<sub>2</sub> and NO the deposition velocities are 1.9 cm/sec and 0.1 cm/sec, respectively (see Table 12.5, Sehmel, 19X4). Using Equation 5.49 (Slade, 1968) to adjust for NO<sub>2</sub> deposition velocity, a value of 0.0272 is obtained. For NO deposition this value is 0.827. This indicates that approximately 2.7% of NO<sub>2</sub> and 82.7% of the NO emitted in the mine will escape to the atmosphere. If ASARCO's assumption regarding the ratio of NO<sub>2</sub>/NO emitted in the mine, then the total release rate would be calculated as: total NO<sub>x</sub> generated in the mine x [(0.9 x .827) + (.1 x .027)], or .7877, not .387.

Based on the factors reported in Appendix I, emission rates for the release of NO<sub>x</sub> to the atmosphere reported in Tables 3.3 Blasting Emissions, Table 3.4 Underground Emission Rates From Diesel Fuel Vehicles at Rock Creek, and Table 3.5 Underground Emission Rates From Propane Combustion would increase by more than a factor of two:

Table	ASARCO Emission Rate	Corrected Emission Rate
3.3	9.08 tpy	18.51 tpy
3.4	4.95 tpy	10.08 tpy
3.5	<u>2.167 tpy</u>	<u>4.4 tpy</u>
Total	16.2	32.99

In addition, ASARCO provides no support for its assumption that 10% of the NO<sub>x</sub> emitted in the mine will be NO<sub>2</sub> which is predicted to have a 30 times greater deposition rate than NO. On the contrary, the evidence submitted by ASARCO supports the conclusion that virtually none of the NO<sub>x</sub> emitted from the in-mine sources will be NO<sub>2</sub>. The emissions data supplied by Caterpillar, which ASARCO relies on for estimating the diesel combustion emissions in the mine, states that "the NO<sub>x</sub> shown is not present in the exhaust but rather is formed in the atmosphere from the NO present in the exhaust." See "Underground Diesel Powered Equipment, Caterpillar, Inc.", Attachment A "Emission Factor Memoranda." High temperature combustion forms NO, not NO<sub>2</sub>. NO<sub>2</sub> will not be created by the propane heaters or in the blasting either. ASARCO provides no basis for estimating that 10% of the NO will be converted to NO<sub>2</sub> in the mine, or that it will be converted early enough in the mine to allow enough transport time for the reported deposition velocity for NO<sub>2</sub> to result in loss of 97.3% of the NO<sub>2</sub> before release to the atmosphere. In order to estimate NO<sub>2</sub> deposition by applying the formula used in Slade which includes a factor for time of NO<sub>2</sub> transport through the mine atmosphere, ASARCO would have to calculate NO<sub>2</sub> formation by establishing what the NO conversion rate is expected to be in the mine, and the retention time for NO<sub>2</sub> in the mine after formation but before release to the atmosphere. In the absence of reliable information to make this estimate, the calculation of NO<sub>x</sub> released to the atmosphere should assume no NO conversion.

If the deposition factor reported by ASARCO in Appendix I is applied to total NO<sub>x</sub> generated in the mine, then NO<sub>x</sub> released from the mine would be calculated by applying the NO release rate (0.827) to total NO<sub>x</sub> generated in the mine. Total emissions would be 34.64 tpy, or more than double the 16.3 tpy reported in the permit which was used to model air quality concentrations and AQRV impacts from the mine operation.

ASARCO reports "that underground diesel fuel-fired equipment will consume 306,365 gallons of No 2 (low sulfur) diesel fuel each year, based on typical diesel fuel combustion." Technical Support Document, 3.2.1.3, p. 3-8. Emissions are calculated based on the volume of fuel burned. But on Table 3.4, ASARCO reduces the calculated emissions from diesel fuel combustion by claiming a 50% load factor. See Note "b". The load factor is itself not documented. In addition, the assumption that emissions of all pollutants will vary linearly with load is not valid.

All sulfur in the fuel will be emitted in the exhaust gas as SO<sub>2</sub> regardless of load. Emissions may be reduced as a result of reduced fuel use which results from lower load factors, but only because the fuel combusted is less and not because of reduced load. Thus if ASARCO continues to assume the same annual throughput of diesel fuel, emissions will not be reduced.



Similarly, NO<sub>x</sub> emissions are reduced as load on the engine is reduced, but this change is also due primarily, although not exclusively, to reduced fuel combustion. In diesel engines, fuel use is typically 80% less at idle than at full load. This lower fuel combustion lowers the ignition temperature in the chamber which in turn results in less NO formation in the engine. While NO formation drops with load, this is primarily because of reduced fuel in the chamber. Thus NO formation is more or less linear with fuel use.

The opposite is true for PM emissions from diesels. PM formation is inversely related to engine temperature. Thus generally PM emissions drop as engine temperature rises, and increase with lower temperatures. Thus PM emissions tend to be inverse to fuel use and therefore with load as well.

Thus ASARCO cannot claim a general reduction in emissions for all pollutants as a function of load. SO<sub>2</sub> has no relationship to load, NO has a relationship with load but primarily as a result of lower fuel use rates, and PM has no reduction with load. The emission reduction based on load is not a reasonable assumption and should be rejected for calculating emissions from the mine.

This is especially true for SO<sub>2</sub> and NO which are primarily related to fuel burned. If ASARCO wishes to claim a reduction in emissions for these pollutants as a result of reduced load, then it should reflect that claim in a reduced estimate of the total gallons of fuel expected to be burned in the mine. But as long as the permit requests permission to burn 306,365 gallons of fuel, emissions of pollutants with emission rates closely linear to fuel combustion should not be reduced because of load factors.

Not applying the load factor to emissions estimates derived from the amount of fuel combusted would result in a doubling of SO<sub>2</sub> and NO<sub>x</sub> emissions from the mine.

ASARCO assumes that all pollutant emissions from diesel equipment operating in the mine will be reduced by 50% based on a claim that diesel units in the mine will operate at only 50% of load. See Table 3.4, Note "b". If some account must be given to the impact of load on emissions, ASARCO has demonstrated why a load factor of 50% should be assumed. This assumption is based on a load factor developed for haul road equipment used in surface mines. There is no explanation provided to explain why this factor is appropriate for diesel equipment ASARCO plans to use in this mine. Nor does ASARCO explain what mining equipment will be diesel powered or why such equipment cannot also be electric powered. It would appear not to be appropriate to use the surface mine example for estimating a load factor since the closest analogue to haul road equipment in an underground mine would be the ore hauling equipment which ASARCO states "will be electrically powered." See Technical Support Document, p. 3-8.

ASARCO does not explain which equipment will be diesel powered. But it would appear from the size of the engines used for estimating emissions that the diesel powered units require higher power ratios than can be easily obtained from mobile electric motors. The equipment in a mine that require such high power ratios are usually the equipment operating at the working face of the mine where large rock is being lifted or moved for transport to the crusher. Mine operations are not cost effective when there is down-time at the working face. Except for a few minutes at shift change or in the event of equipment failure, equipment used to extract rock from the working face is typically operated continuously. If this is the equipment that will be diesel powered, there is no basis for assuming a 50% load factor when calculating emissions from diesel fuel combustion.

Without adequate identification of the diesel powered equipment ASARCO plans to use in the mine and the application of such equipment in the mining operation, a 90% default load factor should be used to calculate NO<sub>x</sub> and PM emissions from diesel combustion in the mine. The application of a 90% load factor would increase diesel NO<sub>x</sub> emissions from the mine to 18.14 tpy instead of 10.08 (using corrected NO<sub>x</sub> deposition factors), and total NO<sub>x</sub> emissions to 42.7 tpy. (S6326)

Response: The applicant has submitted additional information correcting the NO<sub>x</sub> emissions calculations. The modeling done using the corrected emission calculations demonstrated compliance

with the Ambient Air Quality Standards and the Prevention of Significant Deterioration (PSD) increment. Also, Sterling has proposed to use a certain amount of propane for the propane fired heaters and would be limited to the amount of 610,000 gal/yr in the air quality permit. The permit and permit analysis were completed based on Alternative V. The VISCREEN model was run with the new emissions and the maximum visual impacts inside the Class I area screening criteria were not exceeded for each of the seven runs. Alternative V does demonstrate the potential emissions based on the use of electric equipment being used. Sterling would be required to alter the air quality preconstruction permit if they intended to use equipment resulting in emissions that differ from those that the permit is based on.

*16. The modeled deposition rates for assessment of the impact of NOx deposition into Upper and Lower Libby Lakes understate deposition by more than a factor of two thereby compromising the validity of the MAGIC-WAND deposition impact analysis which cannot be relied upon to conclude that deposition will not have an adverse impact on water quality and water quality dependent species.*

*The visibility assessment is also based on less than half of expected NOx emissions and therefore cannot be relied on for the conclusion that mine emissions would have no detectable impact on visibility. (S6326)*

*In addition, the use of faulty emission values in the AQRV analyses for estimating visibility and lake chemistry impacts renders the SDEIS inadequate for purposes of making determinations of impacts on the environment as required by NEPA and §165(d) and (e) of the Clean Air Act.*

*Since the assessments of impacts of mine emissions on visibility and deposition into Upper and Lower Libby lakes are based on an emission inventory that understates NOx emissions by a factor of two, those analyses may not be relied upon for making determinations required by NEPA and § 165(d) and (e) of the Clean Air Act. Those assessments must be revised to incorporate the best estimates of emissions from the life of the mine operation. (S6326)*

Response: The MAGIC/WAND modeling was completed using the potential emissions of Alternative II. The potential emissions from Alternative V are lower than Alternative II. Therefore, the results would be the same if the emissions from Alternative V were used to run the MAGIC/WAND model. These results would show that the estimated changes are not sufficient for the model to project any changes in pH or alkalinity in the upper and lower Libby lakes from the Rock Creek Mine and/or the Montanore project. The analysis would not be revised because higher emissions were used to perform the analysis and therefore the effects would be reduced upon further analysis.

*17. The visibility assessment is not based on a reasonable estimate of maximum visibility impairment since it does not consider the cumulative impact of emissions from the exhaust adit., mill site and tailings disposal/load out area which can occur when winds are from between 190° and 200°.*

*The visibility impact analysis performed for the project considers emissions from each pollutant-generating area of the project separately, i.e., evaluation adit. emissions, mill operations, and tailings disposal/load out operations. The assessment does not include a scenario which evaluates cumulative impact on visibility which can reasonably be anticipated when the wind is from 190° to 200°. The analysis suggests it is appropriate to evaluate emissions from the three emission generating sites separately because of differences in elevation. However, it is well demonstrated that plumes under certain stability conditions that establish a stable boundary layer at ground level do not have a direct impact on higher surrounding terrain which has the effect of obliterating the plume, but rather can travel up and over higher terrain. Admittedly, there is plume loss when the bottom of the plume intersects surface features, but much of the plume can transport over the short distances involved here to combine with*

*downwind plumes before entering the wilderness. This phenomenon should have been considered as part of the visibility analysis since it is most likely to produce the greatest visibility impairment in the Class I area. (S6326)*

Response: The VISCREEN model is used to estimate the potential visible impact of a plume resulting from an individual emission source. Therefore, the model was applied for worst case conditions for individual sources or a group of sources that could still be considered a single source. The modeling was re-run for the corrected emission calculations submitted to the department. The new results also demonstrated that the maximum visual impacts inside the Class I area screening criteria were not exceeded for any of the seven runs.

*18. If you decline to deny the permit based on the information submitted by ASARCO, the permit application needs to be adequately documented before closing the opportunity for public comment. The permit application also suffers from deficiencies including the failure to provide adequate documentation of emissions identified in the attached comments, including deficiencies identified in CRG's comments submitted in 1996.*

*ASARCO's failure to submit adequate explanation for some key assumptions or claims regarding emissions deprives CRG and RCA and their members of an opportunity to address the underlying basis for estimating emissions. Based on these deficiencies, CRG and RCA objects to your finding of completeness and asks that you withdraw the completeness determination and request the applicant to supply the missing information prior to closing the public's opportunity to comment on the application and the SDEIS. (S6326)*

Response: The department has determined that the application is complete and sufficient information has been submitted regarding emissions estimates. Because the application is complete, Sterling is in compliance with all the rules and regulation necessary to issue an air quality preconstruction permit. The comment period provided the opportunity for the public to ask questions about, and receive answers to questions about the underlying basis for estimated emissions. See responses to other comments.

*19. Address violation of air quality standards by a ventilation adit within the wilderness area. (S6745)*

Response: The applicant has submitted worst case modeling and has demonstrated compliance with the National Ambient Air Quality Standards. The emissions proposed by Sterling meet the standards that are set to protect public health and the environment. Additionally, the ventilation adit would be an air-intake not an exhaust-intake adit and so would not be venting mine air into the wilderness.

*20. The SDEIS acknowledges that the mine will cause at least "minimal degradation" to air quality. This general statement does not adequately assess impacts to the area or wilderness. This is particularly important because wilderness lakes have a low buffering capacity to pollution (especially from the ventilation adit). Moreover, air quality is an important factor of both environmental and cultural resources. More detail is therefore necessary for this portion of the assessment. (S2034)*

Response: The agencies were likewise concerned with the potential impact of particulate emissions and their impacts to the wilderness lake (specifically upper and lower Libby Lakes). To determine if any impacts might exist, the lakes have been sampled for a number of years and the monitoring results were evaluated using the MAGIC/WAND model. The estimated changes in acid anions and base cations are not sufficient for the model to project any changes in pH or alkalinity. For more information please see the final EIS, Chapter 4, Air Quality, Alternative V. See other comments and responses in this section.

*21. The problem with the EIS as it currently stands is: there is no way for a third party to review the EIS, and determine qualitatively whether it will have any relationship with the actual emissions. There are no numerical calculations or estimates of emissions based on an understanding of the process and the equipment being used. (S4883)*

Response: The EIS for the proposed Sterling Rock Creek project is a public disclosure document that presents elements of analysis as directed by Council on Environmental Quality (CEQ) guidelines. In part, CEQ guidelines require that baseline environmental conditions be summarized, and that potential impacts associated with various action alternatives be evaluated and compared to the no-action alternative. The impacts of various action alternatives are presented in Chapter 4 of the EIS. The potential emissions from the facility are calculated and can be found both in Chapter 4 and in the air quality permit contained in Appendix C.

*22. How much carbon dioxide would be vented to the atmosphere by the biotreatment plant? The public has a right to know how much, compared to other industrial facilities, this single mine would add to greenhouse gas loading. Are the agencies concerned about such issues? Where is the discussion in the documents? (S3462)*

*Page 2-69 2nd paragraph "Nitrate would have been ...". I disagree with the claim that carbon dioxide is a nontoxic by-product. The greenhouse effect is largely due to excess CO2 emissions? Have there been any estimates of quantity of carbon dioxide emissions? Where is the analysis? (S4832)(S4833)*

Response: At this time carbon dioxide is not considered an air pollutant by either the State or Federal governments. However, assuming 80 percent nitrate removal, near the end of the mine production period an estimated 2200 pounds of nitrate will be removed each day resulting in the generation of approximately 1500 pounds of carbon dioxide. For comparison purposes, the Colstrip power plants are estimated to discharge 86,620,000 pounds of carbon dioxide per day (43,310 tons per day).