

**SUPPLEMENTAL EIS
RESPONSES TO COMMENTS**

SOILS

Soils	SOIL-200
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VOLUME IV

SOIL-200 Soils

1. There is no provisions established in the Montana Discharge Elimination System (SMT-0030287) for Outfall 002 to monitor soil solute leaching potentials at the Paste Storage Facility. The hydraulic conductivity of this basal unit is estimated to be $1.3 \times 10^{-3} \text{ cm sec}^{-1}$ and $7.6 \times 10^{-5} \text{ cm sec}^{-1}$. These conductivity's are way to high and indicate that soil pore holding ability to be very weak which would result in nitrate or heavy metals to readily leach away from the paste storage facility. A seepage rate for Total inorganic Nitrogen at 22.4 mg/L greatly exceeds the current World Health Organization guideline of <10 mg/L. I also fail to see how a seepage rate was quantitatively determined according to Poiseuille's Law. (S3469)

Response: Hydraulic conductivity was evaluated in the baseline studies conducted for the EIS. Additional testing is required as part of the ground water work plan required under the discharge permit. Based on the analysis in Chapter 4, the seepage from the paste facility would not exceed the nondegradation based ground water standard of 7.5 mg/L.

2. Require further investigation at the site before permits are granted to substantiate assumptions about ground water flow and stability of the underlying soils. (S347)(S805)(S1687)(S1851)(S1905)(S4347)(S4359)(S4363)(S4364)(S4393)(S4424)(S4427)(S4431)(S4481)(S4482)(S4633)(S4636)(S4651)(S4653)(S4655)(S4658-S4663)(S4710)(S4714)(S4716)(S4816)(S4830)(S4871)(S4878)(S4891)(S4912)(S5051)(S5052)(S5054)(S5088)(S5555)(S5763)(S5790)(S5857)(S6340)(S6523)(S6526)(S6613)(S6672)(S6677)(S6679)(S6806)

Response: The preliminary data shows the soils in the impoundment area would allow the development of the paste facility with the exception that clays would need to be excavated from the area on which the toe berms would be built. The definitive word on soil stability would be obtained in the final design studies and reviewed by the technical review panel. See the proposed MPDES in Appendix D for the latest ground water flow information.

3. Pg 1-4 2nd paragraph "KNF must also ensure timely ...". Specifically what are these, a performance bond? (S4832)(S4833)

Response: In the EIS process the agencies have identified timeframes for reclaiming various phases of the mine disturbance. A reclamation bond is held to ensure the work is completed according to the schedule. Unless Sterling applied for a revision to the reclamation plan because of unforeseen problems with complying with the reclamation schedule, they would be required to meet those timeframes. The agencies would issue an order to reclaim and could suspend the permit if the reclamation is not completed in a timely manner.

VOLUME IV

SOIL-201 Reclamation

1. *Asarco's Rock Creek Project allows for reclamation to be done sooner, returning the land back to a beneficial use more quickly. (S3277)*

Response: The agencies have mitigated the Rock Creek Mine project in Alternative V. This alternative will provide the most aggressive reclamation schedule of all the alternatives analyzed.

2. *I am troubled and concerned with the proposed seed mixtures of grasses and forbs. My concern is for suitability of certain species for the environment and purpose of the planting, availability of seed for many of the species, lack of evidence that several of the species can be established by direct seeding, failure to include other adapted and readily available species of proven performance. For example, the following species are of questionable utility for one or more of the previously listed concerns: pine grass - Calamagrostis rubescens, elk sedge - Carex geyerii, fireweed - Epilobium angustifolium, pearly everlasting - Anaphalis margaritacea, pussytoes - Antennaria rosea, and strawberry - Fragaria vesca and F. virginiana. From my perspective, to include such untested materials which lack known and reliable seed sources in seeding specifications is unjustifiable and unprofessional. Such a recommendation knowingly or unknowingly jeopardizes the success of the reclamation effort. (S6315)*

Response: The agencies have modified the seed mixes to enhance diversity in the reclaimed landscape. The species mentioned are common in the existing plant communities on the site. The agencies are always trying to maximize the limited diversity in reclaimed communities. Sterling is also testing reclamation methods and species in the Troy Mine reclamation plots. Sterling would be required to try the proposed mixes in some of their first reclamation efforts. During site evaluations if the seed mixes are not satisfactory then modifications would be made by Sterling with agency approval. The seed mixes are always subject to change depending on previous success and failures, availability of seed, etc. The present seed mixes do not jeopardize the success of the reclamation efforts.

3. *In the Troy Unit tailing areas, the following species volunteered on non-topsoiled tailing: Trees - western red cedar (Thuja plicata), grand fir (Abies grandis), engelmann spruce (Picea englemannii), western hemlock (Tsuga heterophylla), western larch (Larix occidentalis), Douglas-fir (Pseudotsuga menziesii), narrowleaf cottonwood (Populus angustifolia). Shrubs - western snowberry (Symphoricarpos occidentalis), black hawthorne (Crataegus douglasii), willow (Salix sp), woods rose (Rosa woodsii), thimbleberry (Rubus parviflorus), currant (Ribes sp), thinleaf alder (Alnus incana). Forbs - fireweed (Epilobium angustifolia), pearly everlasting (Anaphalis margaritacea), strawberry (Fragaria vesca), slenderleaf collomia (Collomia linearis), small epilobium (Epilobium minutum), bluebell (Penstemon sp), common groundsel (Senecio vulgaris). I urge you to reconsider the seeding recommendations in Appendix G. Examine the literature, consult with experts, review the sources and availability of proven plant materials. Develop seeding mixtures which have great potential for achieving successful results. Plan for natural succession to include many local native plant species which readily invade disturbed sites. (S6315)*

Response: The agencies are aware of the species that have volunteered on the Troy tailings. The applicant, Kootenai National Forest, and Montana DEQ personnel as well as the public can propose modifications to the seed mixes at any time based on review of existing sites and new research data. The agencies will consider ideas and propose changes to the mixes to try new seeding combinations. For example, the Golden Sunlight Mine used Ephraim crested wheatgrass in their seed mix at a low rate in some test plots. It has an aggressive nature, a proven record, and can certainly establish and persist in that climate. In the last annual report submitted by the mine, reclamation monitoring indicated a continued trend for the species to be increasing at the expense of other more desirable species. Therefore, it is being deleted from the seed mix on all future plantings.

4. *In reviewing the plans for reclamation of the tailings, I see no documentation whatsoever that the proposed reclamation will work. Nor do I see good evidence that the plan has been reviewed by experts in the field. You state*

that you will be mixing seeds with the paste (that has the consistency of concrete) with a moisture content of 20%. That could be below the so-called "Permanent Wilting Point" depending upon the properties of the paste. I strongly suspect that it is. In the mining areas of the eastern U.S., the experts have found that a major deterrent to reclamation has been lack of appropriate mycorrhizal fungi. The fact that you have not acknowledged this certainly appears to indicate less than adequate investigation, which falls short of the requirements of NEPA. (S6681)

Response: The agencies are confident the proposed reclamation will work on the tailings paste facility as proposed in Alternative V, because the reclamation plan, as proposed and modified by the agencies is state of the art in the western United States. The plan was developed by consultants who are experts in the field. The agencies' experts as well as their consultants on soils, vegetation and reclamation all have M.S. degrees and years of experience in reclamation and revegetation work. Please see Chapter 6 of the supplemental EIS for a list of the preparers of the EIS. The commentor states that the agencies will be adding seeds to the paste which is at wilting point and which has the consistency of concrete. This is incorrect. The paste has a moisture content of 20% to make it flow through the pipes. It has enough moisture to germinate seeds. Soil placed in the field at the time of reclamation has much less moisture and it will grow plants when it is wetted. The normal precipitation in the Rock Creek area will keep the seeds growing. The seeds in the paste are temporary cover crops to reduce visual effects of the tailings, to help control erosion and to provide some organic matter in the tailings. They are not the permanent seed mixtures to be applied after reclamation is complete. The cement, if added to the paste, does not turn it into concrete. The amount of cement added gives it enough strength that it will hold up and not create operational problems to traffic, etc. The bulk density of the paste even with a minimal concrete addition would still be less than many of the lacustrine soils in the area today and would not prevent plants from growing. The agencies are very aware of the use of mycorrhizal fungi in reclamation. The agencies added the use of mycorrhizal fungi to Alternatives III and IV in the draft EIS and the Alternative V in the supplemental and final EIS. See the Chapter 2, Revegetation section of Alternatives III and V. Any new developments in the field of revegetation establishment can be incorporated at any time by the agencies into Sterling's plan.

5. Page 2-42 Issues do not seem to be grouped together here. This applies to Alternative II (and perhaps others): With a soil replacement of 9.5 inches on the tailings impoundment what kind of plants will survive? Will it be possible to evenly cover such a steep gradient with topsoil? Has the establishment of specific species on soil with the same composition as the tailings soil been studied? Is the possibility for dispersal of "non-native grasses and forbes" examined in this document? Will the proposed trees be able to root in the tailings soil? On page 2-50, Alternative V may have an "average replacement depth of 24 inches" as given in Alternative III--but it is hard to tell if this applies solely to Alt. III or it is being picked up from III by V? (S3462)

Response: The applicant proposes replacing 9.5 inches of soil in their plan submitted to the agencies. In the analyses in Chapter 4 for Alternative II, which is the applicant's proposed plan, the agencies concluded that trees will grow but they will not grow well enough to return the land to comparable stability and utility. The agencies increased the replaced soil depth requirement in each of the agency action alternatives to at least 24 inches on all reclaimed acres except where otherwise, specified, such as at the evaluation adit portal and waste rock dumps. The agencies would monitor to ensure that Sterling replaces the necessary volume of soils needed to place at least 24 inches of soil on all reclaimed acres. The mining companies can place soil relatively evenly on steep slopes. The Golden Sunlight Mine in Whitehall has been required to establish a 100' x 100' surveyed grid on their 2:1 and 3:1 waste rock dumps to document that the soil can be placed evenly. If the survey grid reveals a shortfall in some areas more soil is applied until the required depths are achieved. The applicant has been studying establishment of species on similar soils and raw tailings in the Troy mine area. The agencies and the mining company have also observed success of reclamation in the

Rock Creek area on other disturbed sites to identify species that would be adapted to grow on disturbed sites from a mine. The possibility of dispersal of non-native grasses and forbs has been examined in the document in the noxious weed sections in Chapter 4 (see Alternatives II-V Biodiversity, Wildlife Habitat/Vegetation sections). The proposed trees would be able to root into the tailings as they are doing today on the Troy impoundment.

At the beginning of the Alternative V discussion, it states “Alternative V includes the following applicable modifications, mitigations, and monitoring plans from Alternatives III and/or IV, described in the draft EIS.” The 24-inch soil requirement is one of those mitigations.

6. *Page 2-75. Re: Pipeline Corridor Reclamation. Why is it not preferable to have all of the pipeline removed instead of capped and left during reclamation? Save Asarco \$\$\$? (S3462)*

Response: The agency reclamation specialists argued that the proposed plan which called for surface tailings lines was not as good as buried lines. The experience at the Troy mine shows that the tailings line constantly has trees volunteering along the line which have to be removed so the visual impact is greater than if trees were allowed to establish. There also is more of a chance for vandalism with a surface pipeline. Alternative V would bury the lines which are high quality pipelines with limited potential for impacts from tree roots in a 30-year timeframe. The 24 inches of soil would allow for adequate tree growth. The visual effect of the pipeline would be essentially removed within the mine life. The only trees that would need to be removed would be those that would interfere with the overhead powerline. Modern pipelines have adequate monitoring for leaks to minimize the potential for undiscovered leaks along a buried pipeline. In case of a break in a buried pipeline, only a short stretch of the several mile route would have to be excavated and repaired. The area would then be reseeded. The cleaned out pipeline would not present any long-term pollution problems if it is left in the ground at closure. The pipes would be capped, where pipe was removed at stream crossings. Removal of the entire length of pipeline would redisturb the site, lengthening the visual impact and reclamation period along the road corridor.

7. *Page 2-76. "Asarco would need to conduct a detailed soil survey to more accurately determine the amounts and types of soils available for reclamation prior to construction of the paste facility and associated facilities." How can it be acceptable to wait until later to do the soil survey? (S3462)*

Response: The applicant did do a standard soil survey for the proposed plan using accepted U.S. Department of Agriculture techniques. This survey indicates there is plenty of soil to do the proposed reclamation to Alternative V standards. The final soil survey discussed in the EIS would be required to verify amounts of various types of soil available before construction begins because the agencies increased soil salvage and replacement commitments. The agencies want assurance that enough rocky soils exist to cover the various gradients in the reclaimed paste facility area.

8. *An unresolved issue regarding the tailings impoundment is the final revegetation and reclamation plan. Montana law requires that each mining Plan of Operations provide for adequate reclamation.*

The Agencies cannot approve any mining proposal without a detailed reclamation plan. ASARCO has yet to provide one. In fact, they have not even determined if there is enough soil available to cover the impoundment once mining is completed. The Agencies simply cannot approve the Rock Creek proposal until these reclamation issues are resolved and presented in the EIS process. (S6318)

Response: The agencies feel the reclamation plan analyzed in the final EIS is adequate for permitting purposes. See the previous response for information about the need for the detailed soil survey. The agencies have stipulated that Sterling submit final designs for all facilities which will

include regrading, reclamation, and revegetation. The reclamation plan for Alternative V, which is analyzed in the final EIS, was developed by the agencies to mitigate impacts to various resources. It is conceptual in nature but detailed enough for the analyses. The stipulation for final design is necessary for implementation of agency mitigations to the plan, not for approval. If the final designs identify any problems that result in significant variation from the analyses of the conceptual plan, the agencies would have to conduct additional environmental analyses.

9. Page 2-51, Table 2-9 Reclamation of destructive habitat activities for the previous 33 years would only take one year? Is this reasonable? (S4832)(S4833)

Response: The Soil and Reclamation section discussion of Alternate V impacts explains the number of acres that would be reclaimed over the life of the mine. The rest of the mine and paste facility disturbances would have to be reclaimed within two years of closure or abandonment of the facility. This is required by the Metal Mine Reclamation Act. The traditional tailings impoundment proposed by the applicant in Alternative II could have taken up to 10 years to dewater and consolidate before reclamation could begin on the wettest areas of the impoundment. The paste deposition process shortens the time needed to reclaim the tailings. A conceptual reclamation schedule is included in the final EIS. The tailings paste facility would be reclaimed within 2 years after closure because the paste allows equipment operations much faster than conventional tailings impoundments.

10. Additionally, the reclamation plan discussion noted that Agencies believe ASARCO's revegetation and erosion control plans need to be expanded to reduce the risk of sedimentation and revegetation failure. ASARCO has not demonstrated that there is sufficient soil available to reclaim the impoundment site and other mine disturbances. Effective reclamation is a threshold requirement for mine approval, and the NEPA document must demonstrate it will occur. The SDEIS fails to do so, and this must be corrected. (S6318)

Response: The revegetation and erosion control plan expansions mentioned in the question are needed because the agencies have modified the applicant's plans. This is much like a final design before any project is implemented. The agencies would review the plan as staked in the field and make recommendations for additional measures to protect resources. The revegetation changes are needed as revegetation species and quantities change over time. The agencies are constantly adjusting seed mixes as problems arise in implementation over the years. Finally, the agencies have double checked the applicant's soil survey and have proven that there is enough total volume of soil needed to complete the reclamation as modified by the agencies. The final soil survey requirement asked for by the agencies would be used to verify the different types of soils available for various uses. If needed, different soils would be mixed to produce soil growth media tailored for the various slopes on the reclamation sites.

11. Page 2-75 under "Pipeline Corridor Reclamation" Recommend that the pipes not only be drained, but completely flushed and sent to the water quality treatment facilities until the discharge meets current EPA, MDEQ and IDEQ standards. (S4832)(S4833)

Response: The pipeline would be emptied and the ends of the pipe would be capped. Flushing is not deemed necessary because the minute quantities of residual tailings which may adhere to the inside would not measurably impact air, water, land, or biological resources.

12. Page 2-106 last paragraph: "If adits are sealed ...". see page 2-74. Adit closure is supposed to be part of reclamation activities. Unsolved contradiction. (S4832)(S4833)

Response: Sterling's mine permit application is unclear as to whether or not mine adits would be sealed or left free for draining; but probably all mine adits and the ventilation adit would be plugged. The Agency alternatives include plugging the adits. However, under Alternative V, the final mean of

sealing the adits would have to be determined at a later date based on rock mechanics and hydrogeological monitoring. The agencies preference would be to seal the mine by plugging the adits, but if data indicates a likelihood of the creation of new springs and seeps at the ore outcrop zones, then it may be preferable to continue to pump the mine water for treatment if necessary and discharge to the Clark Fork River is perpetuity.

13. Since views of the mountains will also be blocked, an undesirable result, I suggest delaying tree planting to gauge public interest in viewing the developing land form and the phases of reclamation. (S1285)

Response: Trees are volunteering along the highways now and views of the mountains will eventually be blocked unless logging or a fire changes this trend. The agencies have tried to respond to the ongoing public's concern about aesthetics and minimize the views of the developing landform. It is possible that once the paste facility was reclaimed to the point that it blends with the surrounding landscape that the trees which have grown to block views of the mountains could be removed by the private land owner.