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September 23, 2008

Montana Department of Environmental Quality
Rimtop Drive
Billings, MT 59105

1520 E. Sixth Avenue
Helena, MT 59620-0901

Dear Madam or Sir:

Subject: Comments on Noise Section of "Draft Supplemental Environmental Assessment, Permit TMC-002, Threeway Mining Company, Inc., Nuss-Rock Pit Amendment," dated August 25, 2008

In response to a request from the Gateway Opencut Mining Action Group, I have reviewed the noise section of the subject Draft Supplemental Environmental Assessment (EA), and request that you consider the following technical comments. As relayed to me by the Gateway Opencut Mining Action Group, Jo Stephen of DEQ has indicated that there was no formal report on the noise analysis beyond what is contained in the EA. As a result, please note that I would like to reserve the right to expand upon or revise my comments as needed later in the comment-gathering phase of the Conditional Use Permit process.

As background, I have worked in the field of environmental noise analysis and control since the 1970's, with employment at the New York State Department of Transportation, the Federal Highway Administration, Vanderbilt University, and, currently, Bowlby & Associates. Work in Montana has included a statewide traffic noise research study and a Great Falls highway project noise study for Montana Department of Transportation. Our firm was also involved in collecting and analyzing snow machine noise in Yellowstone and Grand Tetons for the National Park Service.

Comments on the Noise Section of the EA:

1. **Operating Hours** – The EA states, "Normal operations include mining, crushing, washing, asphalt operations, maintenance, fueling, and other operations. Normal hours of operation would be from 7 a.m. to 6 p.m. Monday through Friday, and 7 a.m. to 6 p.m. on Saturdays for hauling and maintenance. Previously, maintenance was not included on Saturdays. Mining and processing would not be allowed on Saturdays.



Equipment maintenance would be scheduled on Saturdays for safety reasons. Hauling or moving existing stockpiles could be done on Saturdays.”

- a. A commitment to adhere to these hours of operation is important. Any reasons for outside of these hours should be addressed, as well as any needed permissions for doing so and any limitations on such work. For example, if evening or night operations are to be allowed later on a long-term basis, then this EA has not properly documented the impacts associated with the that work. Nighttime operations, especially between 10 p.m. and 7 a.m., can greatly increase the Day-Night Level (DNL) at the residences and, therefore, the resultant noise impacts.
- b. The proposed action adds to the current noise exposure by allowing previously precluded maintenance to occur on Saturdays. I do not believe that this change in the Saturday noise environment was described in the EA as one of the impacts of the project; that change should be documented. Going from a DNL in the high-30 to low-40 dB range up to the upper 50's or lower 60's is a substantial change of the Saturday noise environment, and is an impact of the proposed action.
- c. No mention is made of operations on Sunday. If none are to be allowed, that commitment should be specifically stated in the EA. If they are to be allowed, even if short-term, that possibility and its impact should be documented. As noted above in point (b), the increase above the ambient would be substantial.
- d. The EA states that “Hauling or moving existing stockpiles could be done on Saturdays.” Elsewhere, on page 4 it states “Normal hours of operation would continue to be 7:00 am to 6:00 pm Monday through Friday. Hours would be *extended to Saturdays* from 7 a.m. to 6 p.m. for hauling and maintenance.” [my emphasis]. It appears that hauling is currently not done on Saturdays. The EA does not state how often such operations would likely occur with the project, making it impossible to gauge the potential noise impact of the proposed Saturday operations.
- e. On page 6 of the EA, in response to a comment, the document states, “DEQ does have authority to set the hours of operation, and can enforce violations of permitted hours of operation. In September 2007, DEQ issued a violation letter to TMC, Inc. documenting two occurrences when the mine was operating outside of its permitted hours of operation, both on weekend days.” First, this statement implies that operations are currently *not* permitted on

weekends. Second, the EA should be more specific on the actions that DEQ will be able to take – and will take – if operations occur outside the permitted hours.

2. Noise Level Measurements – Sound level measurements were made at two sites, N1 and N2.
 - a. According to Figure 5, Site N1 appears to be right alongside Cottontail Road, while the nearby residence is over 200 feet from the road. The measurement notes state that one of the noise sources was “traffic on nearby roads.” The measured sound level of the traffic on Cottontail Road will be much louder right adjacent to it compared to over 200 feet away. This measurement thus overstates the existing sound level at the residence, and therefore understates the sound level increase at the residence due to the project.
 - b. Site N2 was at the northwest corner of Tract 2C-3. However, this location is not near the residence to the immediate north of Tract 2C-3, nor the residence farther to the north. A reason justifying the choice and the representativeness of the measured level at these residences needs to be included in the EA. If the site is not representative, then other measurement sites should be used.
 - c. The sound level measurements were too short in duration to allow confident calculation of a 24-hour Day Night Level (Site N1: 5 minutes during the day and 11 minutes at night; Site N2: 6 minutes during the day, 10 minutes at night). In other words, extrapolating a 5-minute or 6-minute sample to represent fifteen hours of daytime ambient is likely to misrepresent the actual time-varying level during those fifteen hours; the same applies for 10 or 11 minutes adequately representing nine hours of nighttime noise. Sound level monitors should be left out at sites close to the nearby residences for full 24-hr periods. Alternatively, longer-duration spot samples (e.g., an hour) should be conducted for more than just one period during the day and one at night.
 - d. Table 3 notes that “wind in grass” and “wind” were noise sources at Site N1 (day) and N1 (night). There is no mention of the direction of the wind. Wind direction can have a great influence on measured sound levels, with downwind levels being higher than in calm conditions and upwind levels being lower. The EA specifically acknowledges this fact in the text on modeling on page 21 beneath Table 3, “...noise levels can vary significantly due to atmospheric conditions...temporary significant positive and negative deviations from the

averages can occur.” Wind effects on the measured existing levels need to be addressed.

3. Modeling of Existing and Future Levels

- a. On page 18, the EA notes, “The mobile crusher (approximately 17 feet in height) would be periodically moved and set up on a pad a few feet above the high water level near the active mining area, **but no closer than 500 feet from Cottontail Road.**” [my emphasis added] However, Table 5 on page 22 which shows proposed sound levels; indicates that the crusher is no closer than 1,320 feet from a receiver. Page 23 also notes that “The nearest residence to the south is approximately 0.2 miles (1,050 feet) from the typical crusher location.” If the crusher is brought within 500 feet of Cottontail Road, it would be only about 700 feet from this residence, increasing the level substantially over that stated in Table 5. The predicted DNL for this residence would be closer to that described for the residence to the north of the facility – a DNL on the order of just under 61 to 67 dBA.
- b. The second paragraph on page 21 notes, “Diesel-powered equipment, such as loaders and excavators, **intermittently** reach maximum noise levels, L_{max}, 85 dBA at a distance of 50 feet from the equipment.” [my emphasis added] Rather than “intermittently,” a more accurate and descriptive word of the actual operations and associated impacts would be “frequently.” As described in Table 4, the modeled results are based on the loaders at maximum noise level for 40% of the 12 hours from 7 a.m. to 7 p.m., or nearly 5 hours per day. Indeed, the loader noise will be produced for 12 hours per day.
- c. The calculated DNL for the proposed action only includes the crusher and loader. Other noise sources, especially the excavators, loading of trucks, hauling by the trucks, use of other trucks for maintenance and fueling, the wash plant and the asphalt plant, should be included. Indeed, on page 18, the EA notes, “The primary noise sources would be the mobile crusher, the asphalt plant, and diesel heavy equipment (e.g., front end loaders and haul trucks).” Special focus should be made on any changes in the number of operations over the existing case (such as haul trucks) and/or the proximity of these sources to the residences.
- d. The text on page 22 notes a “...2-hour increase in operating time for the Proposed Action...” Yet, Tables 4 and 5 show the same times (7 a.m. to 7 p.m.) for the existing and proposed operations. Table 4 should be revised to

show the shorter existing operating hours compared to the proposed case to more properly portray the change from the existing situation to the proposed case.

- e. The EA states on pages 21-22 that the DNL for the proposed action is approximately 1 dB higher than existing, "...which would not be a noticeable increase." Yet, in reality, the facility would be operating for two more hours per day than at the present, a 20% increase in time exposed to facility noise (12 hours up from 10 hours). Such an increase in time of exposure is likely to be very noticeable to residents, and should be addressed. The small increase in DNL due to a 20% increase in operating time is one of the problems with DNL in describing impacts. If one were to assume for the moment that the EA's noise measurements were adequate to describe the ambient level, the increase in operating time means that for the two hours of extra operation a day, the sound level would increase from the mid-30 dB range up into the 50-60 dB range, which is a substantial increase that would clearly be noticed.
 - f. In part because of the above point, the EA needs to go beyond the sole use of DNL and the change in DNL to discuss: (1) increase in time of operation, (2) related time above some sound level threshold (such as 55 dB), and (3) increase in maximum sound levels over ambient.
4. Impacts – Despite the above concerns that the proposed sound levels may have been underestimated, I agree with the finding that the proposed DNL at the residences will exceed the 55 dB EPA guideline, that the increases in DNL of up to 20-23 dB over ambient DNL are very substantial (and would be depicted as even more substantial if maximum sound levels were used in addition to DNL), and that mitigation should be implemented.
5. Mitigation –
- a. The EA states: "The following measures could be considered to reduce the noise of the project:
 - i. Restrict the crusher and asphalt plant operation to workday hours (8:00 a.m. to 5:00 p.m.).
 - ii. Add berms or barriers along the north and northeastern permit boundaries, in order to completely surround the site (see Tables 4-6).

- iii. Locate the crushing operation as far from residences as is possible.
 - iv. Replace standard back-up alarms with Mine Safety and Health (MSHA)-approved, manually adjustable, ambient-sensitive, directional sound technology, or strobe light alarms. Adjustable and ambient-sensitive alarms typically limit the alarm noise to 5 to 10 dBA above the background noise, which would still typically be audible behind the equipment.
 - v. Install high-grade mufflers on all diesel-powered equipment.
 - vi. Implement a regular maintenance schedule to ensure that equipment is operating properly. Use new equipment rather than older equipment.”
[I replaced bullets with numbers for ease of reference.]
- b. The EA should *commit* to mitigation, not simply state that the measures “could be considered.” My comments on each strategy follow:
- i. I agree that the crusher and asphalt plant operation should be limited to workday hours (8:00 a.m. to 5:00 p.m.). Further, the impact of hauling and maintenance on Saturday needs to be quantified. If maintenance is to be done on Saturdays, the maintenance area must be kept a considerable distance of the residences, say 500 feet, and should be shielded from them by a noise barrier wall of a reasonable height, such as 10-12 feet.
 - ii. I agree that berms or barriers should be required. However, the 6-ft height that is discussed in the EA will mostly likely provide very little noise reduction. Heights of 16-20 feet or greater might be required depending on the source location and source height above ground. The correct needed heights can be modeled with noise modeling software. A noise reduction goal for the barrier/berm design should be no less than 10 dB.

Related to heights, the EA section on Visual Resources states, “Once the overburden berms are established and seeded, mining operations would be shielded from view. However, the berms would continue to be noticeable from the roadway. The berms would not be high enough to block the view of the nearby hills, and should not represent an appreciable impact on the visual resources of the surrounding area.

The gravel stockpiles should be maintained at a height such that they do not obstruct or conflict with views of the hills and surrounding mountains. The proposed "Good neighbor" provisions suggest that stockpiles should not exceed 24 feet (GCC 2008)." There is obviously a trade-off that needs to be considered regarding the need for height to block the noise and the blocking of view caused by that height. The fact that stockpile heights of up to 24 feet are discussed suggests that berms or walls much taller than six feet can also be implemented.

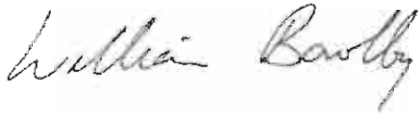
- iii. I agree fully that the crushing operation should be located as far from residences as is possible. Additionally, some type of mobile sound-absorbing noise barrier shield should be developed to be able to be moved with the crusher and oriented to shield the closest residences from the noise.
- iv. Back-up alarms can be highly annoying. The EA states on page 23, "Because of their intermittent, high-pitched, impulsive sound, back-up alarms can cause high levels of annoyance and numerous complaints even at low noise levels, but have little influence on Leq or Ldn values." I totally concur with this statement, especially when the background ambient level is low, as is the case for the project area. The EA suggests consideration of manually adjustable or ambient-sensitive alarms. I also call attention to the use of a newer alarm developed in Europe that has seen limited usage in the US. It produces a directional "shush" noise instead of the purer-tone "beep", making it much less distinguishable at great distances than the beeping. I will try to provide a reference. In any case, back-up alarm noise needs to be mitigated. At a minimum, any fixed-level alarms should be replaced with manually adjustable alarms and then the level should be adjusted to be as low as possible without compromising safety.
- v. I agree that high-grade mufflers should be installed on all diesel-powered equipment. This measure should include *all* haul trucks.
- vi. I also agree that maintenance of these mufflers and all other equipment in proper working order should always be a priority maintenance item. This measure should include *all* haul trucks.
- vii. I agree with the use of newer equipment rather than older equipment, with noise being a criterion in the procurement decisions. The sound

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levels of all equipment used on the site – or planned for use – should be measured, and the worst offenders identified and either quieted or replaced.

Thank you very much for your consideration of these comments.

Sincerely yours,

A handwritten signature in cursive script that reads "William Bowlby". The signature is written in black ink and is positioned above the typed name.

William Bowlby, Ph.D., P.E.
President, Bowlby & Associates, Inc.