



WESTECH

Western Technology and Engineering Inc.

P. O. BOX 6045
3005 AIRPORT ROAD
HELENA, MT 59604
(406) 442-0950

July 22, 1991

Nancy Winslow
Noranda
2501 Catlin, Suite 201
Missoula, Montana 59801

Dear Nancy:

Subject: New World 1991 Field Studies -- Aquatics

In response to your letter dated July 18, 1991 requesting the following additional information:

1) **level of study intended** is as stated in the POS, i.e., one set of summer samples from each station with a set consisting of four Surber replicates and one kick net replicate. In addition, the Stillwater River will be kick net sampled at random locations in an effort to determine the downstream impacts from Daisy Creek and to establish a station below the zone of impact. As in the two previous years, notes will also be made on water temperature, periphyton abundance, streambank vegetation, substrate composition and any noticeable changes in the stream;

2) **field schedule**--field work is anticipated for 25-29 July. Samples will be preserved for analysis in the fall with a report to follow in winter 1991;

3) **sampling sites** will again consist of the 8 stations listed in the POS with no change in location. A lower Stillwater River station will be added in 1991. The alternative tailings sites shown on the map accompanying your letter would be covered by the existing stations.

Enclosed is the revised 1991 aquatics POS. If you have any questions or need any additional information, please let me know.

Sincerely,

Carlene Farmer, Ph.D
Aquatic Ecologist

EXISTING Alternatives

List 3: **CONCERNS OF AGENCY PERSONNEL
LIKELY TO BE ADDRESSED IN COMPLETENESS RESPONSES**
July 16, 1991

Bechtel: → what is seasonally dependent for ea? ?

1. Tailings impoundment:

- Lab tests need to verify assumptions of plasticity.
- Tailings dewatering: "wicks" case study information needed. How does this work?; %moisture?; strength?]
- armor cap thickness - three or four feet of neutral rock may be needed instead of one foot. (all of valley fill fr. tails pond ?)
- liner life - estimates from nuclear industry studies? liner company info?
- location of quarry where additional borrow will be collected for thicker armor cap or downstream face of dam
- case study of erosion rates needed for this setting - how large of rock do we need to ensure the cap will not erode?
- any stream flow over impoundment unacceptable (if diversions are plugged) - would like to see top surface mounded.
- would like a design similar to Golden Sunlight Mine, modified for greater rainfall - implement EPA HELP model

2. Diversion ditches and enlarged natural channels:

- what size rip-rap will be used?
- how much will the natural channels be enlarged?
- how will avalanche debris be handled? Will avalanches be a problem after shutdown?

3. Portal Plugging: *← expert other than Bechtel (see Roy)*

- need case studies of success stories
- details of the technology
- proof that acid will not eat the cement
- strength data

4. Underground mine drainage:

- 18 gpm for whole mine strongly questioned
- question the statement that there will be less stream flow in Fisher Creek after portal plugging - won't the water come out in springs?
- porosity of backfilled tails needed
- need model of fracture permeability, or at least a map with drill holes, depth to water and amount of water produced...possibly also RQD data, fault and fracture data

5. Positive grade or "Bent Straw" design for adit:

- why we will not create a positive grade or "bent straw" in the adit to eliminate drainage from the adit

6. Alternative tailings sites:

- new baseline data needed for alternative tailings sites (see other memo)

7. Snow storage and removal:

- storage areas must be delineated
- equipment listed is not sufficient - see Crested Butte mine equipment and costs

8. Pit Reclamation - amount of neutral rock as a cap

Other issues of concern:

- Worker Camp feasibility - perk tests for drainfield ← see Roy
- Nondegredation issues
- Powerline - PPL involvement - keep informed after comments received
- Sewage discharge permit for groundwater
- Borrow material for quarries
- Bio Assessment - ok not given yet to P. Farmer
- Exploration Permit - U.Ground expl. + ^{H₂O} treatment (U.G.)
 - Caminoo Grp out of Trail BC.

NSW - 7/17/91