Leviathan Mine Superfund Site Technical Meeting:
March 23, 2017 AMEC office 9 am to noon.
Discussion of Remedial Technologies
Proposed Agenda

- **Background and basics:**
  - **NCP Requirements at 40 CFR 300.430 (e) See attached.** PRGs (ARARs, HI<1, Cancer risk 10^{-6}); Technologies combined to form Alternatives; Alternatives Screening (Effectiveness, Implementability, Cost)

- **Leviathan Mine Superfund Site Site-wide Considerations / Current Conditions**

  1. Five point-source discharges (PUD, Adit, CUD, Delta Seep, Aspen Seep) partially controlled/treated through ERAs
  2. Unreliable site access without considerable maintenance, particularly under winter conditions- about 6-month work season each year. Consideration of emergency treatment site access lessons learned this year and opportunities for future?
  3. Only power available is from generators and fuel needs to be trucked to site
  4. Very steep slopes-limited areas to conduct on site treatment activities. Consider expansion of pond 1 to the south if road was moved.
  5. Unstable slopes/active landslides
  6. Tribal/cultural resources
  7. Multiple land owners (California, USFS, private)
  8. Poor vegetative cover on disturbed areas
  9. Non-contiguous land at River Ranch might require response due to irrigation using site affected water; and at ore spill locations along Leviathan Mine Road
  10. Considerations for the unnatural stream channel developed in the upper reach of Leviathan Creek between Delta Seep and Aspen Creek that ponds low pH water.

Draft/Deliberative

- **General Leviathan Mine Remedy Questions**

  1. Is it practicable/ technically feasible to advance power lines to the site to ensure a reliable power supply?
  2. How to establish sufficient Long term capture of all AMD (including the Delta Seep and CUD) whether uphill or down gradient storage is used.
  3. Can sufficient storage to safely contain non-work-season discharges without pumping from the CUD and Delta Seep be constructed on site to allow seasonal treatment to establish storage capacity for the next non-work season discharges? Is increased capacity needed to remedy the need for emergency treatment.
  4. If sufficient storage capacity is not available on-site, is piping to a downstream future storage and treatment facility practicable/ technically feasible?
  5. Would consolidating all the mine waste back into the pit or another on-site repository be practicable/ technically feasible?
  6. Would consolidating discrete areas of mine waste back into the pit or another on-site repository be practicable/ technically feasible?
  7. there sufficient quality analytical data to ID hot spots in the waste
  8. Would filling and capping the pit reduce the amount of meteoric water entering the equation and lessen the overall volume of low pH water requiring treatment?

- **Media Potentially Requiring Remedial Response**

  1. In-Situ Mineralized Rock
  2. Mine Waste

3. Mine Drainage
4. Soil
5. Groundwater
6. Storm Water
7. Surface Water
8. Sediment (stream sediment and floodplain soil)

- Preliminary remedial action objectives and goals need to be developed for each medium.
- Technologies to achieve PRAGs for each medium need to be identified.
- Alternatives need to be composed from technologies.
- Alternatives need to be screened.

Technologies to initiate discussion:

- Make access road suitable for all season.
- Extend power lines to Leviathan Mine (Pond 1, Pond 4, and Aspen…).
- Consolidate all mine waste from overburden area, Delta Slope, and not otherwise supporting site infrastructure within the Pit.
- Expand storage capacity to retain 'off season' CUD and DS flows
- Pipe water to off-site storage/treatment facility.

Draft Agenda

Attachment A: NCP Requirements at 40 CFR 300.430 (e)

PRGs (ARARs, HI<1, Cancer risk 10^{-6})
Technologies combined to form Alternatives
Alternatives Screening (Effectiveness, Implementability, Cost)

(i)Effectiveness. This criterion focuses on the degree to which an alternative reduces toxicity, mobility, or volume through treatment, minimizes residual risks and affords long-term protection, complies with ARARs, minimizes short-term impacts, and how quickly it achieves protection. Alternatives providing significantly less effectiveness than other, more promising alternatives may be eliminated. Alternatives that do not provide adequate protection of human health and the environment shall be eliminated from further consideration.

(ii)Implementability. This criterion focuses on the technical feasibility and availability of the technologies each alternative would employ and the administrative feasibility of implementing the alternative. Alternatives that are technically or administratively infeasible or that would require equipment, specialists, or facilities that are not available within a reasonable period of time may be eliminated from further consideration.

(iii)Cost. The costs of construction and any long-term costs to operate and maintain the alternatives shall be considered. Costs that are grossly excessive compared to the overall effectiveness of alternatives may be considered as one of several factors used to eliminate alternatives. Alternatives providing effectiveness and implementability similar to that of another alternative by employing a similar method of treatment or engineering control, but at greater cost, may be eliminated.

Draft Agenda