State of Oregon
Department of Environmental Quality Memorandum

To: **David Anderson** **Date: 3/1/07**
Eastern Region Project Manager

From: **Paul Seidel,**
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Subject: **Ruth Mine, Risk Assessment Review for DEQ Consistency**

General Comments:

Based on a quick overview of USFS provided documents for general consistency with other DEQ mine sites, DEQ risk assessment staff has provided the following general comments.

The report is entitled a Site Inspection report. However, risk assessments were also apparently performed. The text report also includes interpretations of the significance of the detected analytes, and concludes that no significant risks are present. Typically, risk assessments are not performed as part of preliminary site inspections. The data set from this inspection appears relatively sparse for a complete screening level risk assessment.

Rather, a review of the data is usually performed, followed by an evaluation of data gaps and additional data needs required to perform a risk assessment, data quality objectives would then be defined, including appropriate detection limits, media to be sampled. SAPs would be prepared and the data collected and review prior to completing a risk assessment. This report does include data that is useful for preliminary risk screening. However, there are likely to be some data gaps. For example, mercury is detected in waste rock samples but plan for consideration of the potential for mercury methylation or bioaccumulation of mercury to evaluate this concern was not performed.

No unacceptable risks are identified in the report due to lack of habitat quality and the small size of area affected relative to available habitat. DEQ typically does not consider habitat quality or size of available habitat when evaluating cleanup sites, except when considering home ranges of specific animals. In this case areas of localized impacts would not be considered acceptable, on the basis of habitat and spatial scale.

The finding that concentrations are elevated in Ruth Creek and Battle Ax creek is interesting given the apparently large volume of dilution water. The fact that these concentrations apparently exceed ambient water quality criteria (AWQC) would define these areas as “hotspots” according to Oregon rule, since this is interpreted as impairment of beneficial use.

Background Concentrations:

No figure is provided for background locations. A better understanding of background and variability of metals concentrations in the watershed would be helpful in interpreting the results of soil and waste rock samples. Locating background samples and establishing background concentrations for important COI would be an example of a data quality objective for a risk assessment analysis plan.

Human Health Risk Assessment:

DEQ uses 7 mg/kg to estimate background arsenic concentrations not 10 mg/kg. As per DEQ’s “Background Metals” memo; “when selecting metal background levels for a specific site, the preference for a source of such values is, in order: (1) those calculated from site-specific data (assuming the sampling and analysis were adequate, etc.), (2) local default values (e.g., those for SW Oregon), and (3) the regional default values for the Pacific Northwest listed in the table” (e.g. 7 mg/kg for arsenic).

In this case, a local or watershed-specific estimate would be preferred. Estimates of exposure parameters values, in particular soil intake rates are lower than those that DEQ would typically accept, which probably explains how no unacceptable risks from arsenic were predicted. Usually in these cases, comparison to background becomes an important consideration. Otherwise, the RA looks generally consistent with Oregon DEQ approach.

Ecological Risk Assessment:

No consideration was given to the possibility of mercury methylation and bioaccumulation. Concentrations of zinc and lead in the area of SED-3, 4 and 5 exceed probable effect concentrations by Macdonald et al, 2000. These may be toxic to benthic organisms. The exceedance of AWQC and sediment quality criteria are indicative of potential for unacceptable ecological risks in the aquatic environment that DEQ would consider as needing further evaluation. Other potential risks to terrestrial receptors may also require further evaluation.