

**Thomas Rushing ii - DRC Review Comments -- White Mesa Mill Site Nitrate Investigation Revised Phase 1 Work Plan**

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**From:** Thomas Rushing ii  
**To:** dfrydenlund@denisonmines.com  
**Date:** 5/11/2011 5:08 PM  
**Subject:** DRC Review Comments -- White Mesa Mill Site Nitrate Investigation Revised Phase 1 Work Plan  
**CC:** Goble, Phillip; Hochstein, Ron; Jeremy\_Cox@URSCorp.com; Lundberg, Rusty; Morton, Loren; Paul\_Bitter@URSCorp.com; Robert\_D\_Baird@URSCorp.com; Roberts, Harold; Tischler, Jo Ann  
**Attachments:** DUSA\_WP\_review\_11May2011\_rev2.pdf

**DRC-2011-005609**

Dave,

The DRC review comments regarding the White Mesa Mill Site Nitrate Investigation Revised Phase 1 Work Plan (Dated May 6, 2011) are attached (Via URS Memorandum). Please ensure that all comments are addressed and resolved prior to commencement of field activities in order to avoid lost time and additional costs which may otherwise be incurred.

Let me know if you have questions or concerns regarding the comments. Thanks.

Tom

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## MEMORANDUM

**To:** Tom Rushing (DRC), Loren Morton (DRC), Phil Goble (DRC)  
**From:** Paul Bitter (URS), Jeremy Cox (URS)  
**cc:** Robert Baird (URS)  
**Date:** 11 May 2011  
**Re:** Comments on Nitrate Investigation Revised Phase I Work Plan for White Mesa Mill Site dated May 6, 2011

*This memorandum contains the URS and DRC comments on the Revised Phase I Work Plan for White Mesa Mill Site (Work Plan) dated May 6, 2011, which was prepared for Denison Mines USA (DUSA) by Intera Corporation. This review has been performed as a deliverable for Contract No. 116259 issued through the Utah Department of Environmental Quality, Division of Radiation Control (DRC). This review also is in accordance with the amended Memorandum of Understanding (MOU) between the DRC and DUSA dated April 28, 2011. For purposes of expediency, the URS and DRC comments are edited for conciseness and combined into one memo. Note that format, grammar, and punctuation were not reviewed for accuracy and consistency.*

The comments regarding the Work Plan are presented below. Several of these comments require resolution prior to the start of field work.

1. General Comment: The Phase I Work Plan has incorporated many of the recommendations in the comments provided to DUSA on March 21, 2011 regarding the Feb. 18, 2011 Investigation Work Plan (now superseded). In particular, the objectives of the Phase I investigation and the potential source areas are clarified, and more detail is provided in the Phase I Work Plan when compared to the corresponding sections in the previous work plan.
2. Section 1, first paragraph and thereafter: For consistency and accuracy, all measurements of nitrate in groundwater must be expressed "as nitrogen" and this clarification should be listed with every concentration. For soil, the nitrate concentrations can be expressed as either nitrate or as nitrogen, but the unit of measurement must be presented with every concentration.
3. Section 1.1.1, second paragraph: A disproportionate amount of text is used in this paragraph to explain the potential for a naturally-occurring nitrate reservoir when compared to the text explaining the potential for nitrate contamination from other sources. While the text regarding the potential nitrate reservoir is useful and appropriate in explaining this concept, additional text should be added to explain the potential for the groundwater contaminants originating from the other potential sources.

4. Section 1.1.1, third paragraph: recommend deleting the phrase "the presence of" in this paragraph; that phrase is unnecessary.
5. Section 1.1.2, paragraph following the list of Potential on-Site sources and preceding the "Site Status" section: the last sentence of this paragraph regarding "...the most plausible source..." is unsupported until further field work is produced and the conceptual site model is created and updated with investigation data. Delete the sentence cited herein, from the text.
6. Section 1.1.3, fifth paragraph, last sentence: Following this sentence, please insert "In the October 5, 2010 DRC Notice of Additional Required Action (NOTICE), DRC determined that the 2009 CIR is incomplete, and considered the conclusion regarding the sole source of the nitrogen contamination to be unsubstantiated with direct and reliable evidence. Furthermore, the NOTICE stated that DUSA has additionally identified several onsite sources which have a likelihood of being contributors to the contamination and have yet to be fully examined."
7. Section 1.2, first paragraph: QuanTab test kits for chloride are mentioned in this paragraph but are not consistently mentioned in the procedures listed in Section 2. If these test kits are proposed for use by DUSA, they must be consistently cited in the procedures in Section 2, and the standard procedures for using the test kits must be provided in Appendix E with the same details requested for the nitrate test kits in comment #28 below.
8. Section 1.2, Page 12, paragraph beginning with "Sources 1-8": The second sentence of this paragraph refers to a meeting handout. The handout may have been a previous version of the current Table 1 in the Work Plan. Please refer to current table, as appropriate, instead of referring to the meeting handout.
9. Section 1.4, "data requestors/users" paragraph: The existence of a potential nitrate reservoir is not the only hypothesis to be tested. Suggest stating that the data generated by the investigation will be used to "test hypotheses regarding potential sources for nitrate and chloride contamination, which includes naturally-occurring sources."
10. Section 1.4: The inclusion of the various QC monitors is a positive step initiated by DUSA. However, no QC monitors are designated. Please designate which DUSA personnel will function as these monitors in the text of this section or a table. It is not necessary to designate which laboratory personnel will act as QC monitors.
11. Section 1.6.1: The form for the boring logs provided in Appendix C is a substantial improvement over the boring logs provided in the 2009 CIR. Most of the information requested by DRC is provided on the form. However, DRC requests that fields for the sample coordinates and coordinate system also be provided on the form. The inclusion of survey data (i.e., sample coordinates) on the form was requested by DRC in comment #28 in the comments submitted to DUSA on March 21, 2011. There appears to be space at the top of the form where these fields can be entered. Similarly, the text cites Appendix A which contains the ASTM procedure for description and identification of soils. List the field observations/tests that will be conducted on soil cores per the ASTM procedure.
12. Section 2.1, Page 20, Item #2a: Please add a semicolon after "95%" to clarify this text.

13. Section 2.1, Page 21, last paragraph for Phase 1a, last sentence: Plugging the borings is the abandonment. Please delete "prior to abandonment" in this sentence and perform this edit where this text is repeated in the document.
14. Section 2.1, Page 22, last sentence following list of potential sources, and Section 2.1, Page 23, fifth paragraph: DRC requires that DUSA cite the reason(s) for the delay in sampling locations #1, 2, and 15 and the anticipated schedule for sampling these locations. These samples are required per Attachment 1, p.3 of the April 28, 2011 Tolling Agreement (Rev.1). DRC will consider the investigation reports to be incomplete if these source locations are not sampled.
15. Section 2.1, second paragraph on Page 23: A mass balance approach to evaluate potential source areas is implied by this paragraph but not explained. Please add text to this paragraph to briefly summarize the approach for a mass balance calculation, and repeat this edit where appropriate for other investigation phases in the document.
16. Section 2.2, sixth paragraph, number 2: The last sentence cites the sample as "...background" or "baseline" sample for this location". DRC prefers to use the term baseline in the context of sample identification described in this section. Therefore, the baseline sample discussed in the paragraph cited herein should be designated GP-two digit sample number -BL - Phase - boring number. The term "background" should have a unique application to samples discussed in Section 2.1, Paragraph 1A.
17. Section 2.2: Equipment decontamination shall be implemented for all non-disposable equipment that comes in contact with soil before moving direct push equipment to a new location or collecting a new sample for any non-disposable equipment used to handle samples prior to placement in laboratory-supplied glassware.
18. Section 2.3.1, last paragraph: DRC recommends that both the top and bottom of the sample interval be included in the sample ID. In addition, the convention for sample IDs for QC samples should be included in the text of this paragraph.
19. Section 2.5.2: Please provide minimum detection limits (MDL) and practical quantitation limits (PQL) for each of the EPA laboratory methods to be used for analysis of the soil sample leachates extracted (EPA 1312). Please demonstrate and justify why said MDLs are sufficiently sensitive for purposes of this study.
20. Section 2.6.1: As stated in previous meetings and comments, DUSA should provide a sampling and analysis table as a template for recording sample collection and reporting. The QC samples must include equipment blanks to assure, among other quality control concerns, no rinsate is carried over to sample results. Equipment blanks must consist of DI water, obtained from a commercial third party source. The DI water must be contacted with all surfaces that may come into contact with site soil. Equipment blank samples should be collected after equipment decontamination at a frequency of one equipment blank per 20 field samples. Equipment blanks will be analyzed at the same contract laboratory as the soil samples and for the same analyses as the leachate from the soil samples. Per Table 3-1 of the 2011 EPA Contract Laboratory Program Guidance for Field Samplers (EPA 540-R-09-03), field duplicates must be collected at a minimum rate of one field duplicate for every ten

samples. Please adjust the text in this paragraph accordingly. This comment can be combined with comment 26, below.

21. Section 2.6.3.4: The EPA document cited in this paragraph was updated in 2010. Please update the citation here and in Section 5. Also, please modify the workplan to include the EPA criteria for accepting RPD results when the concentrations are less than 5-times the PQL value.
22. Section 2.8: This paragraph states that "Test kits will use the calibration methods set forth in the instruction manual provided with the test kits." No such calibration procedure appears to be included in the instructions for the nitrate test strips in Appendix E. DRC suggests that analyzing DI water (obtained from a third party commercial source) with the test strips could serve to verify that non-detect values register as non-detect on the test strips. Laboratory results will serve to verify detectable results for the test strips in Phase 1C.
23. Section 3.0, fourth paragraph: DRC recommends that the contracted laboratory make the conversion between milligrams per liter of extract and milligrams per kilogram of soil and that the calculation be provided in the report.
24. Figure 2: The chlorate tanks should not have a red outline, since no sampling is planned around these tanks.
25. Table 1: Please label Phase 1A, 1B, and 1C on the table and split the sampling locations for each part of Phase 1A into separate rows. Analyses by field test kits need not be shown on this table but can be listed at DUSA's preference. If field test kit sampling is shown on the table, the laboratory analyses and the field test kit analyses must be clearly differentiated.
26. Table 1: The addition of this table to the Phase I Work Plan is an improvement over the lack of tables summarizing sampling in the February work plan (now superseded). However, Table 1 does not include all of the information requested by DRC in comment #41 in the comments submitted to DUSA on March 21, 2011. DRC requested at that time that "the planned sampling be summarized in a table showing the sample locations; number, and types of samples for each location; the types of analyses and the associated container type, holding time, and preservative; and the planned QA/QC samples at pre-determined locations." Table 1 does not include all of this information. Please supplement Table 1 with an additional table showing the following for each sampling location:
  - Sample location ID for each planned sample point
  - Analyses to be performed for each planned sample
  - Sample containers and minimum sample volume required for each planned sample
  - Additional QC samples (field duplicates, equipment blanks, matrix spike/matrix spike duplicates) to be collected at pre-determined locations, with the previously outlined information (sample location ID, analyses, sample container, and minimum sample volume) for each of these samples.The preservative for the containers in the field (6° C) may be included on the supplemental table or retained separately in the current Table 2.
27. Table 2: Please cite the source for the information in Table 2 in a note beneath the table.

28. Appendix E: Per a request by DRC in the April 20, 2011 meeting with DUSA, the minimum detection limits and error rate for the test kits, as provided by the manufacturer, must be provided in this Appendix or in the text of the Work Plan that refers to this Appendix.

[End of comments]