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Colorado Department
of Public Health
and Environment

April 24, 2000

Mr. Gary Gamble
Environmental Project Manager
Hecla Mining Company
6500 Mineral Drive
Coeur d'Alene, ID 83815-8788

RECEIVED

MAY 01 2000

Colo. Dept. of Health
Grand Jct. Office

Dear Mr. Gamble:

Subject: Hecla Durita Site License Number 317-02 Long-Term Monitoring Plan

The Laboratory and Radiation Services Division of the Colorado Department of Public Health and Environment has reviewed Long-Term Monitoring Plan submitted under the requirements the radioactive materials license for the Durita Mill Site. The Plan appears to be complete and adequate. The plan clarifies the revegetation and well plugging schedule as discussed with Mr. Simpson on March 30, 2000.

There are two issues that should be noted in regard to your plan. Section 6.0, Revegetation, should clarify that the success of the reclamation on the tops of the heap tanks is dependent upon the vegetation. Both the flat slopes and the vegetation on the tank tops contribute to erosional stability. Secondly, the Department of Energy may also look at air photos or remote sensing data to verify repository stability. This point should be checked with the Department of Energy.

If you have any questions regarding this letter, do not hesitate to contact Don Simpson at the Department's Grand Junction Regional Office, at 970.248.7033.

Sincerely,

W. Jacobi, Program Manager
Radiation Services.

✓ Cf: Don Simpson

Response: Hecla or its engineering consultant will check all certifications to see that they are current (performed at least annually in most cases), as recommended by the relevant ASTM or manufacturer's recommendation.

Comment #33: Data for ground water monitoring Well MW-12 in Figure 15 of the Plan indicates a potentiometric level of 5303.7'. Shouldn't this level be 5503.7'?

On Figure 15, ground water monitoring well MW-14 indicates a potentiometric level of 5543.1'. The reported depth to water measurements contained in Appendix D appear to be relatively consistent. However, these depth to water measurements yield a potentiometric level which is approximately 35 feet lower than expected given the piezometric surface configuration shown on Figure 15. Please explain this apparent anomaly or revise the piezometric surface map for the site.

Response: The Division's comment is correct. The water level for MW-12 on Figure 15 of the plan should be 5503.7. This error will be corrected on the first revision of the figures to be prepared after completeness and adequacy issues are resolved.

As stated in the Explanation of Figure 15, the water levels listed next to each monitor well were measured on August 1, 1991. These were the last measurements made before the plan was submitted. Both Chapter 6 and Appendix D of the plan state that MW-14 has very low yield and very slow recovery. Therefore, the 8/1/91 water level in MW-14 was considered to be lower than equilibrium level and not a dependable value for interpretation of ground water potentiometric contours. The dashed and discontinuous contours of Figure 15 near MW-14 reflect this judgment. The 11/14/91 water level in MW-14 was 5551.8, showing a trend for this water level to increase if allowed enough time. We believe that there is insufficient additional data to justify revising the Figure 15 contours at this time.

Comment #34: Section 6.4 of the Plan states that the upper most water bearing unit under the site is not a potential water resource based upon portions of RH Part 18, Appendix A, Criterion 5B. The basis for a detection monitoring program is the protection of aquifer quality regardless of water quality.

The Division cannot accept Hecla's proposed actions 1,2 and 4 contained in Section 6.4. A detection monitoring program will need to be submitted by Hecla in order to address the requirements of Criterion 5B and 7 including designation of point of compliance well(s), designation of background well(s) and establishment of concentrations limits for constituents found in the tailing materials. The Plan should also contain lower limits of detection (LLD's), provisions for reporting of all field parameters collected and a specific location where filtering will occur (field or laboratory). Please note that reported the LLD's for arsenic, molybdenum and selenium were unacceptably high.

Response: Hecla's statement in Section 6.4 of the plan, that the Durita site activities have had no detectable impact on the ground water, is supported by the data. Although Hecla

disagrees with the Division about the need for any extension of the present monitoring program, we will submit a revised program by June 1, 1992, as specified in license condition 28.5.3 of Amendment 5 of the site Radioactive Materials License.

Comment #35: Were the monitoring wells physically surveyed-in for both location and elevation? If so, please provide the documentation and the elevations of all referenced water level measuring points. If the wells have not been surveyed-in, please do so and provide this information by June 1, 1992.

Response: The new monitoring wells, MW-8 through MW-14, were located by surveyor-tape measurement of distances and offsets from the fence lines and fence corners. The reference base for these measurements is the aerial photogrametric base map by ITS of Grand Junction. Elevations at well locations were determined by interpolation between two-foot contours on this base map, allowing a precision within 0.5 feet. We believe this provides the necessary accuracy for monitor well collar coordinates. Water level measurement data, including reference points, are contained in Appendix D of the plan. See Well Construction and Ground Water Sampling and Testing Sections of that appendix.

Comment #36: Based upon current geologic information, does a pathway exist for ground water to travel from the site to the Coke Oven Ranch Well?

Response: Based on the available geologic and hydrologic data, the Coke Oven Ranch Well (Permit #4-43-030127) can produce 30 gpm from the Dakota Formation at a depth of 180-250 feet. There is no known hydrologic pathway between the site surface and the producing zone of this well.

Comment #37: The detection monitoring program for ground water will need to address the frequency and duration of the program and provide a specific methodology for comparing background well concentrations to downgradient well concentrations. If natural geochemical differences in water quality make typical statistical procedures invalid, then Hecla should propose an alternate methodology.

Response: See response to Comment #34.

Comment #38: The Plan indicates that wells MW-8 and MW-14 are background wells for the site. However, the plan for surface water drainage (Figure 12) indicates that MW-8 will have to be abandoned during construction of the "central drainage". The water level measurements taken at MW-14 have yielded unexpected results. What measures will Hecla take to establish background well(s) that will exist before, during and after reclamation?

Response: MW-8 will not have to be abandoned because of drainage channel construction. It will be protected during construction from damage by equipment and after construction using a rock/concrete/steel enclosure against damage from channel flows. It can operate continuously without interruption.

Comment #39: RH Part 18, Appendix A, Criterion 5B states that the point of compliance well must be selected to provide prompt identification of ground water contamination on the hydraulically downgradient edge of the disposal area. None of the current wells at the site monitor the aquifer at the downgradient edge of the disposal area. How will this be accomplished?

Response: See response to Comment #34 above.

Comment #40: Figure 16 needs to be updated to show the present reclamation schedule. Please specify a time when the design documents for Phase III and IV reclamation activities will be submitted to the Division.

Response: Figure 16 will be updated as soon as those Division completeness and adequacy comments that could affect the schedule are resolved. Hecla has also stretched out Phase III to permit better resolution of open questions concerning evaporation pond closure.

Please give me a call if you need additional information about these responses.

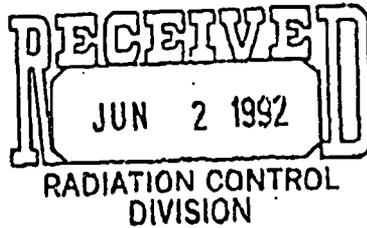
Very truly yours,


Gary R. Gamble
Environmental Engineer

Attachments

cc: Larry Drew - HMC
George Wilhelm - HMC
Alan Kuhn - AKG

FILE



Company	<u>Hecla - Durita</u>
License No.	<u>317-02</u>
Year	<u>1992</u>
File	<u>3B1</u>

May 29, 1992

Mr. Don Simpson, Senior Geologist
Radiation Control Division
Colorado Department of Health
4210 East 11th Avenue
Denver, Colorado 80220-3716



RE: Colorado Radioactive Materials License No. 317-02, Detection Monitoring Program for Groundwater Protection

Dear Mr. Simpson, *Adequacy Review*

Recently added license condition 28.5.3 as well as comment numbers 34, 37, and 39 of your March 20, 1992, letter requires Hecla to submit additional information concerning the Durita Site groundwater monitoring program. Provided in this letter is the additional information you requested.

We understand that the Division has a responsibility to ensure the protection of water quality within the State of Colorado. Appendix A of Part 18 requires that in the Division's consideration of the potential adverse effects on groundwater quality it must consider the quantity of groundwater, the proximity and withdrawal rates of groundwater users, the current and future users of the groundwater, the existing groundwater quality, the potential for health risks associated with human exposure, as well as the potential of hazardous constituents to migrate from the disposal area.

As outlined in detail in the reclamation plan, the following summarizes the uppermost water-bearing aquifer as it relates to the Divisions's criteria:

- the quantity and yield rate of water is low,
- the areal extent is poor,
- the proximity to users is poor,
- the quality is poor,
- the recharge capability is poor, and
- there is no present or foreseeable future use of the water.

The Phase II groundwater investigations characterized the upper most water-bearing unit according to Criterion 5G of Appendix A. This characterization demonstrates that the upper most water-bearing unit is not a potential water resource under the applicable portions of Criterion 5B of Appendix A.

A long history of water quality information has been provided to the Division since 1977. The water quality information provided by the installation of the new wells last year are

in line with this historical data base, and clearly show that the facility activities which encompassed approximately 18 months of operation and approximately 13 years of various idle or decommissioning activities have had no impact on the ground water quality.

After site reclamation, any potential driving force for groundwater contamination that may currently exist will be removed. Also, it must be realized that the disposal cells on site are not typical of a uranium tailings impoundment. There is very little liquid remaining in the tailings in the leach tanks. All disposal units have low-permeability liners. When site reclamation is finished all will be covered with compacted low-permeability clayey soils. In addition, the remaining liquids in the raffinate and the evaporation ponds will undergo technical evaluation for drainage and treatment during Phase III of the reclamation.

Designation of Point of Compliance Wells

The site contains disposal areas (three leach tanks and six evaporation ponds) in close proximity which together comprise a tailings management system. The appropriate location for the point of compliance wells is the hydraulically down-gradient edge of the tailings management system. MW-11 and MW-12 are strategically located at this down-gradient edge and are designated as the point of compliance wells. The site encompasses a relatively small area and the present wells provide an adequate detection system for the tailings management system.

Designation of Background Wells

MW-8 and MW-14 are located hydraulically up-gradient from the tailings management system and are designated as background wells.

Constituents to be Monitored

According to Division guidance, arsenic, selenium, molybdenum, and uranium are generally the most mobile of expected hazardous constituents that may be located in tailings or tailings solutions, and are therefore good to use as indicator species for the determination of impoundment leakage. Analyses of the Durita feed tailings demonstrates that molybdenum is not present in concentrations above area soil background levels and selenium is present in low concentrations just slightly higher than the measured natural selenium level in area soils. Specifically, the molybdenum concentration in all feed tails analyzed was less than 50 mg/kg while the average background concentration was 30 mg/kg with a standard deviation of 15 mg/kg. The average selenium concentration in the tails was 4.9 mg/kg with a standard deviation of 2.0 mg/kg, compared to a soil background concentration of 0.52 mg/kg with a standard deviation of 0.19 mg/kg. Arsenic values in the tails averaged 26.7 mg/kg with a standard deviation of 5.2 mg/kg. The average background arsenic concentration in area soils was 9.82 mg/kg with a standard deviation of 2.9 mg/kg. Arsenic represents the logical choice as the indicator species for the routine monitoring program.

During and until the completion of site reclamation we propose the following frequency for water sampling and analyses:

Semi-annual monitoring: Field determinations for pH, specific conductance, temperature, water depth, and water elevation. Laboratory determinations for arsenic, chlorides, sulfates, total dissolved solids, sodium, gross alpha, and natural uranium.

On an annual basis additional laboratory analyses will be conducted for thorium-230, and radium-226.

After site reclamation is complete, groundwater sampling will be reduced to an annual frequency for all wells and analyzed for all the above parameters. If no impact is apparent from the uranium leaching activities, sampling and analysis will be discontinued three years after site reclamation is complete, or until title to the site is transferred to the State of Colorado or United States, whichever occurs first.

Establishment of Concentration Limits

We propose the following above background concentration limits:

Arsenic	0.05 mg/l
Gross Alpha	15 pCi/l
Thorium-230	60 pCi/l
Radium-226	5 pCi/l

Isopleths of all chemical constituents from the background and point of compliance wells will be developed and plotted on a semi-annual basis. Successive plots will be compared with previous plots to graphically illustrate variations in constituent concentration. In addition, time vs. concentration graphs of indicator species will be prepared from each background and point of compliance well. The plots will be compared to identify time- and/or location-specific shifts or trends in concentrations.

Lower Limits of Detection (LLD's)

The following LLD's will be required by the analytical laboratory:

Arsenic	0.005 mg/l
Unat	0.001 mg/l
Chloride	5 mg/l
Sodium	5 mg/l
Sulfate	5 mg/l
Radium-226	0.2 pCi/l
Thorium-230	0.2 pCi/l
Gross Alpha	0.2 pCi/l

Provisions for Reporting Field Parameters

Field parameters will be recorded by the field technicians at the time of data collection. This data will be reported to Hecla by the consultant contracted to conduct the monitoring of the wells along with the analytical laboratory reports.

Filtering of Water Samples

When filtering of water samples is required, it will be conducted in the field.

Very truly yours,


Gary R. Gamble
Environmental Engineer

cc: Larry Drew - HMC
George Wilhelm - HMC
Alan Kuhn - AKG