

September 7, 2005

Mr. Mark Thiesse
GPC West District Supervisor
Water Quality Division
Wyoming Department of Environmental Quality
510 Meadowview Drive
Lander, WY 82520

SUBJECT: RESPONSE TO COMMENTS, PATHFINDER MINES CORPORATION,
SHIRLEY BASIN ANNUAL GROUND-WATER CORRECTIVE ACTION
REPORT, SOURCE MATERIALS LICENSE SUA-442 (TAC LU0095)

Dear Mr. Thiesse:

By letter dated August 11, 2005, the Wyoming Department of Environmental Quality (WDEQ) forwarded comments to the U.S. Nuclear Regulatory Commission (NRC) staff regarding the annual ground-water corrective action report submitted by Pathfinder Mines Corporation (PMC) on March 1, 2005, for the Shirley Basin site. In its comments, WDEQ expressed concerns that certain anomalous ground-water, and surface water monitoring results could be indicative of future contaminant migration after PMC deactivates the remediation system, as would be permitted after approval of the alternate concentration limits for the site. The following discussions provide responses to WDEQ's comments and a summary of health and environmental protection provisions to be mandated by the amended license.

WDEQ states that according to the subject report, a potential pulse of contamination migrated through the area of MC-11 in 1999, and was expressed as surface water contamination at sample location SW1A. WDEQ expresses concerns that if this pulse could happen while the remediation system is active, then deactivating the system will increase contaminant fluxes to Spring Creek. NRC staff reviewed chloride ground-water concentrations, and potentiometric surfaces maps contained in the subject report. Our review indicates that a pulse of contamination (i.e., 673 mg/l chloride) appeared to migrate past MC-11. MC-11 is located 500 to 1,000 feet northwest of recharge well WW23, which is beyond the containment zone formed by on-site recharge and extraction wells. Therefore, it is unlikely that this contaminant pulse escaped from, or bypassed the remediation system. Rather, a more likely scenario is that recharge from WW-23 forced a pulse of existing contamination to flow away from the remediation system toward Spring Creek (see page 4.1-1 of report).

Regarding contamination to Spring Creek, a review of the data for location SW1A indicates that TDS, chloride, sulfate, natural uranium, and radium-226 appeared to spike during the years 2000 and 2001. However, according to Figure 5.0-1 of the report, SW1A is at least 1,000 feet upstream of any point where contamination passing MC-11 could potentially have entered Spring Creek. Therefore, the contamination spike noted in Spring Creek by WDEQ is likely unrelated to the Shirley Basin site.

WDEQ noted a zone of elevated contaminant concentrations approximately centered around well MC-15. A review of Appendix A, Table A-1, of the subject report indicates that well MC-15 has exhibited elevated levels of contamination since 1992 (chloride, sulfate, TDS). PMC states that seasonal variation may be influencing more recent analytical results; however, chloride, sulfate, and TDS concentrations have remained relatively high even during active remediation at the tailings impoundment. Therefore, seasonal variability does not appear to sufficiently explain the MC-15 anomaly. The NRC staff will request an additional explanation from PMC under separate correspondence; however, at this point in time, the NRC staff has concluded that residual contamination at MC-15 does not affect our ability to approve ACLs for the site.

Regarding contamination on the east side of Spring Creek, PMC undertook hydrogeologic investigations to determine hydraulic gradients on the east side of Spring Creek. Results indicated that hydraulic gradients were oriented toward Spring Creek. Therefore, it is unlikely that groundwater contamination from the Shirley Basin site would traverse Spring Creek.

The NRC staff is sensitive to WDEQ's concern regarding contaminant migration after PMC deactivates the current remediation system. However, the NRC staff plans to include certain protective provisions in the amended license approving the ACLs to monitor and remediate, if necessary, ground-water contamination. For example, additional monitoring wells will be added to the network to better track contamination that may migrate toward Spring Creek. The monitoring frequency will be increased to bi-monthly ground-water, and surface water sampling for the first 1.5 years after system deactivation. PMC also agreed to maintain the remediation system intact for at least the first year after deactivation until such time that the NRC staff is confident that future remediation will not be required.

We appreciate your comments regarding PMC's annual monitoring report, and your concerns regarding the future of the Shirley Basin site. If you have any questions regarding this letter or other related matters, please contact me at 301-415-7182 or by e-mail at sjc7@nrc.gov.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

Sincerely,

/RA/

Stephen J. Cohen, Hydrogeologist
Uranium Processing Section
Fuel Cycle Facilities Branch
Division of Fuel Cycle Safety
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Office of Nuclear Material Safety
and Safeguards

Docket No.: 40-6622
License No.: SUA-442

cc: T. Hardgrove, PMC
R. Hoy, LQD, Cheyenne
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M. Thiesse

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