



BILL RICHARDSON  
GOVERNOR

**State of New Mexico  
ENVIRONMENT DEPARTMENT**

**Ground Water Quality Bureau  
Harold Runnels Building  
1190 St. Francis Drive, P.O. Box 26110  
Santa Fe, New Mexico 87502-6110  
Telephone (505) 827-2918  
Fax (505) 827-2965  
Fed Ex (87505)**



RON CURRY  
SECRETARY

DERRITH WATCHMAN-MOORE  
DEPUTY SECRETARY

August 18, 2005

Sai Appaji, Remedial Project Manager  
Superfund Division  
U. S. Environmental Protection Agency, Region 6  
1445 Ross Avenue  
Suite 1200  
Dallas, TX 75202

RE: New Mexico Environment Department acceptance of proposed Site ground water contaminant standards for the Homestake Mining Company Mill Site (CERCLIS ID NMD007860935), Milan, New Mexico

Dear Sai:

The New Mexico Environment Department (NMED) has received a letter dated June 21, 2004, addressed to Gary Janosko of the U. S. Nuclear Regulatory Commission (U.S. NRC), entitled "Grants Project—SUA-1471—Docket No. 40-8903, Chinle Aquifer Site Standards." This letter follows upon earlier submittals to the U.S. Environmental Protection Agency (U.S. EPA) and U.S. NRC that address the establishment of background concentrations for aquifers that have been impacted by Homestake Mining Company (HMC) Site activities, namely:

- "Ground-water hydrology for support of background concentration at the Grants Reclamation Site" (Hydro-Engineering, LLC for HMC, December 2001)
- "Ground-water monitoring and performance review for Homestake's Grants Project, NRC license SUA-1471 and discharge plan DP-200, 2001" (Hydro-Engineering, LLC for HMC, March 2002)
- "New Mexico Environment Department concerns about ongoing remedial activities at the Homestake Mining Company (HMC) Superfund Site, McKinley (sic) County, New Mexico; CERCLIS ID NMD007860935" (NMED to U.S. EPA, November 13, 2002)
- "Follow-up to meeting on November 19, 2002 regarding Homestake Mining Company Superfund Site, Cibola County, New Mexico; CERCLIS IS (sic) NMD007860935" (NMED to U.S. EPA, November 25, 2002)
- "Homestake Mining Company uranium mill, source material license SUA-1471, Cibola County,

RE: New Mexico Environment Department acceptance of proposed Site ground water contaminant standards for the Homestake Mining Company Mill Site (CERCLIS ID NMD007860935), Milan, New Mexico

8/18/2005

- New Mexico" (U.S. EPA to U.S. NRC, April 8, 2003)
- "Response to comments on Site background water quality document (9/02 EPA comments, 6/03 NRC comments) [HMC to U.S. NRC, July 7, 2003]
  - "Background water quality evaluation of the Chinle Aquifers" (Hydro-Engineering, LLC for HMC, October 2003)
  - "Statistical evaluation of Chinle aquifer quality at the Homestake Site near Grants, NM" (Environmental Restoration Group, Inc. for HMC, October 2003)
  - "Request for additional information—Homestake request to revise background water quality concentrations to Site license SUA-1471—Docket No. 40-8903, Homestake uranium mill, Grants, New Mexico" (U.S. NRC to HMC, November 5, 2003)
  - "New Mexico Environment Department comments on the Homestake Mining Company's background water quality evaluation of the Chinle aquifers" (NMED to U.S. EPA, March 29, 2004)
  - "Response to New Mexico Environment Department (NMED) comments on "Background water quality evaluation of the Chinle aquifers"—October 2003" (HMC to U.S. NRC, June 23, 2004)
  - "Response to New Mexico Environment Department (NMED) comments on proposed ground water background concentrations for HMCo Grants Millsite. — January 20, 2005", (HMC to NMED, June 9, 2005)

These manuscripts document the process used to evaluate available site data, through which NMED approves the following concentrations for aquifers as representative of current background concentrations. The methodology for calculating the 95<sup>th</sup> percentile background value is described in the aforementioned documents. The applicability of the values is limited to the site boundaries defined by Township 11 North, Range 10 West in Sections 2, 3, 4 and Township 12 North Range 10 West in Sections 22-29, 32-36.

NMED requested that HMC re-calculate background concentrations for the alluvial aquifer using the last 10 years of data rather than the entire 23 year dataset to better define contaminants migrating from off-site. The 10 year dataset better represents off-site contamination moving on-site today as demonstrated by the time series plots comparing the entire dataset from 1977-2003 (1976 through 1998) to the last 10 years of that dataset from 1993-2003 (1995 through 2004). For example, nitrate concentrations in the alluvial wells decreased with time from 1977-2003 (1976 through 1998) for most alluvial wells but increased in time from 1993-2003 (1995 through 2004).

HMC estimated the flow velocity at 0.7 feet per day, however NMED interprets the flow velocity as having a wider range from approximately 4 to 0.1 feet per day because of the heterogeneity in the alluvial system. The upper portion of the alluvial aquifer flow velocity range supports the 10-year data set. The middle and lower portion of the flow velocity range may be poorly connected to the rest of the alluvial aquifer and would be more susceptible to degradation, sorption or other forms of attenuation. Based on a lack of trend data and longer flow paths with slower velocities in the deeper aquifers, only the alluvial aquifer system was evaluated for the 10 year data set.

RE: New Mexico Environment Department acceptance of proposed Site ground water contaminant standards for the Homestake Mining Company Mill Site (CERCLIS ID NMD007860935), Milan, New Mexico  
8/18/2005

NMED was also concerned with the increasing trend for most contaminants of concern in well R. Further analysis of the far upgradient wells indicates contaminant concentrations are within the same relative range as the upgradient wells with no apparent trend. Therefore, a "slug" of contamination with higher concentrations does not appear to be migrating towards the Homestake Mill from upgradient. As a result, NMED approves the following concentrations for aquifers as representative of background concentrations:

Table 1

Contaminant	Aquifer				
	Alluvial	"Mixing zone"	Upper Chinle	Middle Chinle	Lower Chinle
Selenium (mg/l)	0.32	0.14	0.06	0.07	0.32
Uranium (mg/l)	0.16	0.18	0.09	0.07	0.03
Molybdenum (mg/l)	NA	NA	NA	NA	NA
Sulfate (mg/l)	1500	1750	914	857	2000
Chloride (mg/l)	NA	NA	412	NA	634
TDS (mg/l)	2734	3140	2010	1560	4140
Nitrate (mg/l)	12	NA	NA	NA	NA

NA = Not Applicable because the background value was lower than the New Mexico numerical standard for chloride at 250 mg/L, nitrate at 10 mg/L and molybdenum at 1.0 mg/L.

Additionally, the U.S. NRC has set the following ground water contaminant concentration standards for the alluvial aquifer, with NMED's agreement:

Vanadium	0.02 mg/l
Thorium-230	0.30 pCi/l
Ra-226 + Ra-228	5 pCi/l

NMED also accepts 250 mg/l as the chloride numerical standard for the remaining aquifer zones, based upon the New Mexico WQCC Regulation 20.6.2.3103.B NMAC. Similarly, NMED accepts the 10 mg/L as the nitrate numerical standard for the remaining aquifer zones, based upon the New Mexico WQCC Regulation 20.6.2.3103.A NMAC. Background concentrations for Molybdenum are below the State standard of 1.0 mg/L at 20.6.2.3103.C NMAC. Background concentrations for Uranium are below the current State standard of 5.0 mg/L. However, a revision approved in 2004 will lower the uranium standard to 0.030 mg/L, which will be effective in 2007 and is consistent with the federal maximum contaminant level.

For all other parameters not specifically cited, the numerical State standard is located at 20.6.2.3103 NMAC. The background standards selected above do not apply outside the Homestake mining operation. If these concentrations resulted from upgradient contamination by a responsible person and not a natural source, the background concentrations set forth do not preclude NMED from requiring the responsible person to clean-up the contamination. In the event new information becomes available, the background values may require revision.

HMC's letter of June 21, 2004 to the U.S. NRC proposes to establish a value of 0.01 mg/l as the background concentration for vanadium in the Chinle mixing zone and the Upper Chinle non-mixing zone aquifers. NMED accepts this proposal, but notes that on p. 6-11 of HMC's report "Background water quality evaluation of the Chinle Aquifers" (Hydro-Engineering, LLC for HMC, October 2003), HMC has made a

RE: New Mexico Environment Department acceptance of proposed Site ground water contaminant standards for the Homestake Mining Company Mill Site (CERCLIS ID NMD007860935), Milan, New Mexico  
8/18/2005

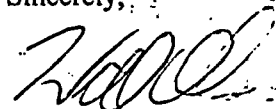
case for higher numerical standards, based upon its analysis of the 95<sup>th</sup> percentile values.

HMC's letter of June 21, 2004 to the U.S. NRC proposes waiver of Site vanadium ground water contaminant concentration standards for the Middle and Lower Chinle non-mixing zones, based upon the observation that all observed vanadium contaminant concentrations in 2003 are less than the 0.01 mg/l standard that is proposed for the Chinle mixing zone and Upper Chinle non-mixing zone aquifers, and vanadium's limited mobility in groundwater. HMC also advances the same argument to propose waiver of site standards for thorium, Ra-226 + Ra-228, and nitrate in the Chinle mixing and all Chinle non-mixing zone aquifers. NMED agrees with the proposal that background concentrations below the proposed numerical standards makes it is no longer necessary to have site-specific contaminant standards for vanadium, and for Ra-226 + Ra-228.

NMED will incorporate these standards in the forthcoming renewal of DP-200 for the Site. Additionally, NMED expects the forthcoming revision of the Site's Corrective Action Plan to reference these standards.

Please contact Jerry Schoeppner at (505) 827-0652 if you should have any questions.

Sincerely,



William C. Olson  
Bureau Chief

Cc: Mary Ann Menetrey, MECS Manager  
Dana Bahar, SOS Manager  
Jerry Schoeppner, MECS  
Jake Ingram, SOS  
William von Till, U.S. NRC  
Al Cox, Homestake Mining Company  
Milton Head, Murray Acres Community Association  
HMC 2005 correspondence file  
NMED/GWQB/SOS July 2005 read file