



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION IV  
1600 EAST LAMAR BOULEVARD  
ARLINGTON, TEXAS 76011-4511

September 20, 2022

EA-21-180

Mr. Brad Bingham  
Closure Manager  
Homestake Mining Company of California  
P. O. Box 98 Hwy 605  
Grants, NM 87020

SUBJECT: HOMESTAKE MINING COMPANY OF CALIFORNIA - NRC INSPECTION  
REPORT 040-08903/2021-002, DISPUTED CITED VIOLATIONS REVISED

Dear Brad Bingham:

On October 19, 2021, the U.S. Nuclear Regulatory Commission (NRC) issued Inspection Report 040-08903/2021-002 and Notice of Violation (Notice) to Homestake Mining Company of California (HMC), Agencywide Documents Access and Management System (ADAMS) Accession No. ML21286A797. The inspection report and Notice documented two Severity Level IV violations associated with the radiation protection controls at your facility. These violations included the failure to: (1) use a radiation work permit or standard operating procedure during contractor work with radiologically contaminated materials, in accordance with License Condition 24; and (2) perform surveys to evaluate the magnitude and extent of radiation levels, with two examples, as required by 10 CFR 20.1501.

In a letter dated November 30, 2021 (ML21337A108), you provided a written response and disputed both violations. On December 15, 2021 (ML21349A004), the NRC acknowledged receipt of your letter.

The NRC conducted a detailed review of your November 30, 2021, letter and examined circumstances and applicable regulatory requirements in accordance with Part I, Section 2.8 of the NRC Enforcement Manual. This review included staff who were not involved in the original inspection effort and included a Health Physicist from the Uranium Recovery and Materials Decommissioning Branch from the Office of Nuclear Material Safety and Safeguards and a Health Physicist from the Division of Radiological Safety and Security in Region IV. The details of the NRC's evaluation are contained in the enclosure.

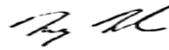
After consideration of the bases for your dispute of the subject report violations, the NRC concluded that both violations held merit, but the violations were better characterized as a single violation with three examples. The modified language for the violation is provided in the enclosure. The NRC will reissue Inspection Report 040-08903/2021-002 to revise the Notice of Violation and clarify any incomplete or misleading wording.

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter, its enclosure, and your response if you choose to provide one will be made

available electronically for public inspection in the NRC Public Document Room or from the NRC's ADAMS accessible from the NRC website at <http://www.nrc.gov/reading-rm/adams.html>. To the extent possible, your response should not include any personal privacy or proprietary information so that it can be made available to the public without redaction.

If you have any questions concerning this matter, please contact Greg Warnick, Chief Decommissioning, ISFSI and Operating Reactor Branch, of my staff at 817-200-1249 or at [Greg.Warnick@nrc.gov](mailto:Greg.Warnick@nrc.gov).

Sincerely,



Signed by Muessle, Mary  
on 09/20/22

Mary C. Muessle, Director  
Radiological Safety and Security Division

Docket No. 040-08903  
License No. SUA-1471

Enclosure:  
NRC Evaluation of Licensee Response  
to a Notice of Violation

cc with enclosure:

A. Maurer, New Mexico Environment Department  
S. Rodriguez, New Mexico Environment Department  
D. Crosby, New Mexico Office of the State Engineer  
M. Purcell, Environmental Protection Agency

HOMESTAKE MINING COMPANY OF CALIFORNIA - NRC INSPECTION REPORT  
 040-08903/2021-002, DISPUTED CITED VIOLATIONS REVISED - DATED SEPTEMBER 20,  
 2022

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ADAMS ACCESSION NUMBER: **ML22263A281**

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| OFFICE  | DRSS/DIORB   | NMSS  | C:MLB   | TL:ACES             |
| NAME  | BBaca  | MPoston-Brown   | NO'Keefe  | JGroom              |
| SIGNATURE   | /RA/ E   | /RA/ E  | /RA/ E  | /RA/ E JGK for      |
| DATE  | 08/03/22   | 08/03/22  | 08/04/22  | 08/05/22            |
| OFFICE  | RIV:RC   | NMSS  | OE  | D:DRSS              |
| NAME  | DCylkowski   | JMarshall   | JPeralta  | MMuessle            |
| SIGNATURE   | /RA/ E   | /RA/ E  | /RA/ E  | /RA/ E              |
| DATE  | 08/09/22   | 09/18/22  | 09/15/22  | 09/20/22            |

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## **NRC Evaluation of Licensee Response to a Notice of Violation**

### **Restatement of the Original Violations:**

On October 19, 2021, the U.S. Nuclear Regulatory Commission (NRC) issued Inspection Report 040-08903/2021-002 and Notice of Violation (Notice) to Homestake Mining Company of California (HMC or licensee), Agencywide Documents Access and Management System (ADAMS) Accession No. ML21286A797. The original violations are restated below:

#### **040-08903/2021-002-01: Failure to use a radiation work permit or standard operating procedure**

10 CFR 40.3, states that a person subject to the regulations in this part may not receive title to, own, receive, possess, use, transfer, provide for long-term care, deliver or dispose of byproduct material or residual radioactive material as defined in this part or any source material after removal from its place of deposit in nature, unless authorized in a specific or general license issued by the Commission under the regulations in this part.

NRC Materials License SUA-1471, Condition 24, states, in part, that the licensee shall be required to use a Radiation Work Permit (RWP) for all work or nonroutine maintenance jobs where the potential for significant exposure to radioactive material exists and for which no standard written procedure already exists.

Contrary to the above, on six occasions from May 6, 2021, through July 23, 2021, the licensee failed to use an RWP for nonroutine maintenance conducted by contractors, for which the potential for significant exposure to radioactive material existed, and for which no written procedure existed. Specifically, nonroutine maintenance performed by contractors on the pond spray evaporators, which were known to be radiologically contaminated, was not conducted using an RWP, and no standard written procedure existed for this work.

#### **040-08903/2021-002-02: Failure to perform surveys as required by 10 CFR 20.1501**

10 CFR 20.1501 states, in part, that each licensee shall conduct surveys that are reasonable under the circumstances to evaluate the magnitude and extent of radiation levels, and the potential radiological hazards of the radiation levels and residual radioactivity detected.

Contrary to the above, the licensee failed to conduct surveys that were reasonable under the circumstances to evaluate the magnitude and extent of radiation levels and the potential radiological hazards of the radiation levels and residual radioactivity detected, with two examples. Specifically, the licensee failed to conduct surveys to evaluate the extent of radiological contamination during the daily sampling of the reverse osmosis unit, which is known to contain radioactive contamination. In addition, the licensee had not conducted surveys of personnel during groundwater sampling of radiologically impacted wells, to evaluate the extent of radiological contamination levels.

### **Summary of the Licensee's Response:**

By letter dated November 30, 2021 (ML21337A108), HMC disputed the violations documented in NRC Inspection Report 040-08903/2021-002. The licensee stated the NRC staff inappropriately applied regulations, license conditions, and facility standard operating procedures (SOPs) to the HMC activities. Therefore, HMC contested both cited violations and provided the following:

Enclosure

1. The license allows the Radiation Safety Officer (RSO) to determine what surveys are “reasonable under the circumstances.”
2. The licensee believes that contamination onsite is consistently very low, supported by historical survey results that groundwater sampling and other types of water sampling activities at the site are unlikely to result in contamination of personnel.
3. The license allows the RSO to determine whether an RWP is needed or whether SOPs are adequate.
4. HMC completed a study of personnel contamination at the site and stated that the study results were consistently below the action levels.

### **NRC Evaluation of the Licensee Response:**

The NRC staff determined that both violations were indicative of a failure to provide required information to occupational workers about the current radiological hazards for specific work activities and the appropriate radiological precautions necessary to reduce exposure to uranium and its daughter products. Our review of the SOPs you provided in support of your contention found them lacking in the radiological information required by License Condition 23. In the absence of this information in SOPs, License Condition 24 requires you to use RWPs where there is a potential for significant exposure to radioactive material exists.

For the examples documented in Inspection Report 040-08903/2021-002, you indicated that you do not use RWPs and do not routinely perform surveys. In the absence of current radiological measurements, you and your occupational workers will not be aware of changing radiological conditions. Examples 1 and 2 in the revised violation wording below reflect processes that concentrate byproduct material over time, creating changing radiological conditions.

Your letter disputed certain facts associated with the original violations. You provided information intended to show there was little need to conduct contamination surveys and that radiological conditions do not pose a significant hazard. However, the staff considered that evidence general in nature, unconvincing as it relates to the violations, and not directly applicable to examples 1 and 2 in the modified language for the recharacterized violation below.

The original violations focused on lack of contamination surveys and failure to use an RWP rather than the broader issue of communicating the radiological hazards and radiation safety practices necessary to ensure radiological exposure was maintained ALARA. The licensee provided information and perspective that caused the reviewers to conclude that clarity is better provided by a more direct statement of NRC concerns that focuses the violation on the license conditions and the SOPs.

HMC License Conditions (LCs) 23 and 24 require the licensee to either use an RWP or SOPs to characterize the radiological hazards and establish the appropriate controls to minimize or prevent exposure. The licensee’s November 30, 2021, response to the NOVs indicated a preference to use SOPs over RWPs.

The inspectors from the original inspection, when interviewed, described observing activities where the licensee did not take radiological surveys or use typical and expected radiological precautions, instead relying on historical knowledge that contamination has been very low.

The staff review identified the following observations:

1. Existing SOPs

The existing SOPs identified by the licensee as being used for the activities identified in the original violations are ineffective in conveying the required radiological information on hazards and the appropriate controls to protect against those hazards. This caused the licensee to fail to meet LC-23 requirements and invalidates any claim that an RWP, as required under LC-24, is not needed.

2. Violation 040-08903/2021-002-01

Violation 040-08903/2021-002-01 involved periodic maintenance performed by contractors to clean the pond spray evaporators, which were known to be radiologically contaminated, without respiratory protection. The licensee stated that this work was not conducted using an RWP, and that the work was “mentioned” in SOP 23 with references to other procedures. The NRC reviewers determine that no standard written procedure existed for the specific work scope of cleaning the spray nozzles.

The site’s Radiation Protection Program Manual lists “inhalation of long-lived radionuclides in airborne particulates released from dried evaporative salts...or from liquid aerosols released from turbo misters” as potential radiation exposure pathways, yet these hazards were not addressed in any standard procedure or RWP for this work scope. The licensee’s response compared the radiological hazard to a 2017 calculation to estimate dose from certain activities. The reviewers concluded that this calculation appeared to be nonconservative compared the potential airborne (inhalation) hazard from radioactive scale concentrated on the spray nozzles that was blasted off and atomized by high pressure sprayers that could be inhaled by the worker in much closer proximity than analyzed in the 2017 calculation.

The reviewers concluded that this work created the potential for internal dose due to inhalation of radioactive material in the form of scale particles and water spray. Therefore, the licensee’s failure to perform samples or surveys to evaluate the radiological hazard present from the buildup of scale was contrary to sound radiation protection principles and negatively impacted the decision not to implement procedures and engineering controls to ensure radiological doses are ALARA. The licensee’s contention that extensive knowledge and historical information allows them to make valid decisions on radiological precautions has limited applicability and does not relieve them of the need to use sound radiological practices to verify that current radiological conditions are as expected when those conditions are not static.

3. Violation 040-08903/2021-002-02 example one

The first example of Violation 040-08903/2021-002-02 involved exposure to the reverse osmosis unit while taking samples of the process water. This system is intended to remove 11e(2) radionuclides from impacted groundwater, which over time builds up in the system. This constantly changing source term is recognized in SOP 4, “Reverse Osmosis Operations Monitoring,” which states that physical hazards include “Brine solutions in various tanks, piping, and equipment pond which may contain elevated contaminant concentrations, including radionuclides.” Instead of requiring radiation measurements to assess the current dose rates, the licensee indicated that it relies on

historical knowledge of the radiological conditions. The reviewers concluded the failure to determine the current dose rates prior to working in the vicinity of changing radiological conditions was contrary to sound radiation protection principles and negatively impacted the decision not to use procedures and engineering controls to ensure radiological doses are ALARA.

4. Violation 040-08903/2021-002-02 example two

The second example of Violation 040-08903/2021-002-02 involved groundwater sampling of radiologically impacted wells. The licensee's response included information supporting the claim of low concentrations of radioactive material in the groundwater. However, the reviewers identified that the SOP 17, "Groundwater Monitoring (HP-15)," contained no pertinent radiological hazard statement or radiation safety practices.

### **Recharacterization of the Violation Examples**

License Condition 23 of NRC Materials License SUA-1471, Amendments 56 and 57, require, in part, that standard procedures shall be established for all activities involving radioactive materials that are handled, processed, or stored. Procedures shall enumerate pertinent radiation safety practices to be followed.

License Condition 24 of NRC Materials License SUA-1471, Amendments 56 and 57, require, in part, that the licensee shall be required to use a radiation work permit (RWP) for all work or nonroutine maintenance jobs where the potential for significant exposure to radioactive material exists and for which no standard written procedure already exists. The RWP shall describe the following: (a) the scope of work to be performed; (b) any precautions necessary to reduce exposure to uranium and its daughters; and (c) the supplemental radiation monitoring or sampling equipment necessary prior to, during and following completion of the work.

Procedure SOP 4, "Reverse Osmosis Operations Monitoring," revision 2 describes the general monitoring operations of the reverse osmosis water treatment plant to ensure compliance with NRC Materials License SUA-1471. The Hazard Identification section stated, in part, that brine solutions in various tanks, piping, and equipment pond may contain elevated contaminant concentrations, including radionuclides.

Procedure SOP 17, "Groundwater Monitoring (HP-15)," revision 8 provide instructions for ground water sampling. Step I.4.b states, in part, that samples contain 11.e(2) byproduct material unless otherwise noted.

Procedure SOP 23, "Collection and Evaporation Pond Operations & Tailings Inspections," revision 3 describes the general operations of the collection ponds and evaporation ponds to ensure compliance with NRC Materials License SUA-1471. The Hazard Identification section stated, in part, that brine solutions in various tanks, piping, and equipment pond may contain elevated contaminant concentrations, including radionuclides.

Contrary to the above, the licensee failed to enumerate pertinent radiation safety practices to be followed using written procedures or use an RWP for work or nonroutine maintenance jobs where the potential for significant exposure to radioactive material exists that describes: (a) the scope of work to be performed; (b) any precautions necessary to reduce exposure to uranium and its daughters; and (c) the supplemental radiation monitoring or sampling equipment

necessary prior to, during and following completion of the work, as evidenced by the following three examples:

1. On August 24-26, 2021, the licensee performed sampling of the reverse osmosis system water using procedure SOP 4 without using an RWP. Procedure SOP 4 identified radiological hazards associated with the various process components but failed to enumerate pertinent radiation safety practices to be followed. In addition, Procedure SOP 4 failed to identify the supplemental radiation monitoring or sampling equipment necessary prior to, during, and following completion of the work.
2. On six occasions between May 6 and July 23, 2021, the licensee performed cleaning, repair, replacement and descaling of the APEX evaporative sprayer heads/nozzles for an evaporation pond using procedure SOP 23 without using an RWP and failed to provide a standard written procedure which described: (a) the scope of work to be performed; (b) any precautions necessary to reduce exposure to uranium and its daughters; and (c) the supplemental radiation monitoring or sampling equipment necessary prior to, during and following completion of the work because SOP 23 did not cover work to clean the sprayer nozzles.
3. On August 24-26, 2021, the licensee performed sampling of groundwater of impacted wells using procedure SOP 17 without using an RWP. Procedure SOP 17 failed to identify any radiological hazards associated with the pertinent activities contained in the procedure and contained no specific radiological safety actions. In addition, Procedure SOP 17 failed to describe any precautions necessary to reduce exposure to uranium and its daughters or identify the supplemental radiation monitoring or sampling equipment necessary prior to, during and following completion of the work.

#### **NRC Conclusions:**

In consideration our improved understanding of the cause of the violations described in Inspection Report 040-08903/2021-002, the violations were revised. The focus is now more clearly on both of the site-specific license conditions that are intended to ensure that you evaluate and characterize the radiological conditions associated with work, maintenance and operations and provide workers with appropriate precautions to keep exposure as low as reasonably achievable (ALARA) as required in your radiation protection program.