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Decommissioning, Uranium Recovery & Waste Programs
Office of Nuclear Materials Safety and Safeguards
U.S. Nuclear Regulatory Commission
MS T-5A10, 11545 Rockville Pike
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RE: Homestake Mining Company of California - Grants Reclamation Project – Response to NRC Request for Supplemental Information and Revised Request for Amendment to License No. SUA-1471; Docket 040-08903 Modification of License Condition 32 regarding RST Qualifications

Dear Mr. Linton:

Homestake Mining Company of California (HMC) is submitting this response to the U.S. Nuclear Regulatory Commission's (NRC's) November 4, 2020 request for supplemental information (RSI) (ADAMS Accession No. ML20287A399) and a revised request to amend NRC License SUA-1471 for the Grants Reclamation Project (Site) to address corrective action #6 from Section 4.3.1 of HMC's Self-Assessment Report dated August 31, 2018 (ML18248A260), which states:

6. *"Barrick shall determine and establish the site staffing levels necessary for safe and effective implementation of key functions based on experience; training, certifications; knowledge-management needs; and timing of expected retirements, resignations and reassignments."*

The recent COVID-19 pandemic and public health emergency has highlighted an ongoing staffing concern with respect to the Radiation Safety Technician (RST) role at the Site. The RST is a key position for implementation of the Radiation Protection Program (RPP) as required by 10 CFR 20.1101 for licensed facilities, yet the qualifications for this position under license condition (LC) 32 are difficult to meet due to a generic reference to NRC Regulatory Guide (RG) 8.31 (NRC, 2002). The guidance in RG 8.31 recommends

appropriate levels of education, experience, and training for a full-time RST at an operational uranium recovery facility.

As detailed in HMC's attached response to the NRC's RSI dated November 4, 2020 (ADAMS Accession No. ML20287A399) (Attachment 1) regarding HMC's original August 14, 2020 amendment request on this matter (ML20225A272), when the milling facilities at the HMC Site were demolished and the windblown soil contamination cleanup was completed in 1995, the NRC approved reductions in the occupational RPP (license Amendment 21; ML080030063) that resulted in major reductions in RST responsibilities and daily time commitments.

Given this historical licensing action, along with the recently demonstrated low potential for occupational exposures at the Site (Table 1) [well below the 500 mrem/yr threshold that requires occupational dose monitoring under 10 CFR 20.1502(a)(1)], RG 8.31 specifications for RST qualifications are excessive and inconsistent with the 10 CFR 20.1101 requirement that the RPP should be "*…commensurate with the scope and extent of licensed activities and sufficient to ensure compliance with the provisions of this part*", which includes an objective to "…*achieve occupational doses and doses to members of the public that are as low as is reasonably achievable (ALARA)*". Under these circumstances, RG 8.31 criteria for RST qualifications are not appropriate or necessary to ensure compliance with the ALARA objectives of 10 CFR 20.1101, the occupational dose limits in 10 CFR 20.1201, and the public dose limits in 10 CFR 20.1301.

Table 1: Estimated maximum potential occupational doses based on monitoring Study results [from ERG, 2018 (ML19154A582)].

Dose Pathway	Source	Exposure Type	Dosimetric Quantity	Maximum Annual Dose (mrem)
Inhalation	Air Particulates	Routine Operations	CEDE	1
Inhalation	Air Particulates	Non-Routine RWPs	CEDE	29
Inhalation	Radon Progeny	Routine Operations	CEDE	10*
External Exposure	Gamma Radiation	Routine Operations	EDE	13*
			Total Effective Dose Equivalent (TEDE):	**53**

*Estimated net (above-background) value attributable to Site operations.

Specifically, this LAR proposes that LC-32 be modified with the addition of the following sub-part:

D. An exception to the specifications in NRC Regulatory Guide 8.31 is permitted with respect to qualifications and training requirements for the Radiation Safety

Technician (RST), subject to the following specifications: The RST shall successfully complete at least 40 hours of health physics training relevant to uranium recovery facilities, including basic radiation science, radiation protection principles and basic regulations. In addition, any new RST candidate must also receive the general radiation protection training given to all new employees (approximately 2 hours), and an additional 2-3 hours of Site-specific RST training from the Radiation Safety Officer (RSO) that pertains specifically to the Site's Radiation Protection Program (RPP) to include the following subjects:

1. Applicable regulations and license conditions
2. Radiological hazards
3. RPP Manual
4. Occupational radiation monitoring program
5. Environmental radiation monitoring program
6. Radiation measurements and instruments
7. Standard operating procedures
8. RWPs and FLRAs
9. Daily RST walkthrough inspections
10. Documentation and records retention
11. Administration of radiation protection training for contractors
12. Regulatory inspections

A separate exam will be given for the general radiation protection training and the Site-specific RST training with a minimum acceptable score of 70% on each exam. The RST training specified above shall be documented. Requirements for any new RST candidate will also include at least two weeks of on-the-job training with respect to RST duties, to be administered by the existing RST and overseen by the RSO and Assistant RSO (ARSO). Requirements for any new RST candidate will also include a three-month probationary performance review period to be jointly evaluated by HMC radiation protection staff (RSO, ARSO and RST). Upon completion of the performance review period, a consensus recommendation from the radiation protection staff will be made to the Closure Manager and Health, Safety and Environmental Superintendent for consideration of a permanent RST appointment. Previous applied experience with the principles and implementation of RPPs at facilities with a radioactive materials license may be substituted for a portion of the on-the-job training requirement at the discretion of the RSO. Experience with uranium recovery facilities is preferred but not mandatory.

Attachment 2 to this submittal provides NRC Form 313. HMC understands that this proposed licensing action is eligible for a Categorical Exclusion to the requirements of 10 CFR 51 per the criteria in §51.22(c)(3)(iv). Therefore, no Environmental Report is provided as identified in Criterion 9 of 10 CFR 40 Appendix A.

Thank you for your time and attention on this matter. If you have any questions, please contact me via e-mail at bbingham@homestakeminingcoca.com or via phone at 505.290.8019.

Respectfully,

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Enclosures
Attachment 1: HMC Response to November 4, 2020 RSI from the NRC Regarding LC 32 Requirements for RST Qualifications.
Attachment 2: – NRC Form 313

ATTACHMENT 1

HMC Response to November 4, 2020 RSI from NRC Regarding LC 32 Requirements for RST Qualifications

Preface

The following presents Homestake Mining Company of California (HMC) Responses to the NRC's November 4, 2020 request for supplemental information (RSI) (ADAMS Accession No. ML20287A399) regarding HMC's August 12, 2020 request to amend NRC License SUA 1471 for the Grants Reclamation Project (Site) with respect to License Condition (LC) 32 and modification of the qualifications required for the Radiation Safety Technician (RST) position at the Site (ADAMS Accession No. ML20225A272). Regulatory comments are shown below in italics, followed by HMC's response.

HMC Responses to November 4, 2020 RSI from the NRC (ML20287A399)

RSI #1

a. Provide a description of the radiation safety technician (RST) duties under the current program and describe how the duties of RSTs have changed at the Homestake Mining Company of California (HMC or the licensee) Grants Reclamation Project (GRP) as the risks have changed. In addition, address the measures in place to ensure adequate protection of the occupational workers, the public and the environment.

HMC Response: Current RST duties include onsite management and implementation of the Radiation Protection Program (RPP) as defined in the RPP Manual (currently Revision 3, 2019) and associated standard operating procedures (SOPs), including administration of personnel dosimetry and bioassay sampling programs, radiological contamination surveys, occupational and environmental air monitoring, inspection of effluent control and waste containment systems, enforcement of worker compliance with RPP procedures, and records keeping for surveys, monitoring, instrument calibrations and quality control maintenance. In addition, the RST evaluates potential radiological contact or exposure circumstances associated with non-routine projects or activities, and informs the RSO of the scope of work through verbal communications, summary descriptions on field level risk assessment (FLRA) forms, and forwarding of any project workplans to the RSO for review, evaluation and determination of the need for radiological controls, ranging from contamination surveys for personnel and equipment release, to issuance of a radiation work permit (RWP) with radiological monitoring of worker exposures (e.g. air monitoring, bioassay, etc.).

The primary changes in RST responsibilities over the history of the HMC Site occurred in 1993 in advance of decommissioning of milling facilities and cleanup of windblown soil contamination (license Amendment 16; ADAMS Accession No. ML080030029), and again in 1995 after all milling facilities had been demolished and buried in accordance with the approved Decommissioning and Reclamation Plan (DRP) and the vast majority of windblown soil contamination had been removed and placed/covered in the tailings impoundments to permanently isolate these radioactive materials from the active surface environment (license Amendment 21; ML080030063) (USNRC, 1995). Amendment 21 reduced license condition requirements for the occupational RPP, including removal of the requirement for routine personal contamination surveys when leaving the facility, limiting equipment release surveys to items subject to contact with mill tailings, and modification or elimination of other occupational RPP elements related to removal of the mill (ML080030063). In approving Amendment 21, the NRC noted the following:

> "*Many of the license conditions that Homestake is requesting to be removed were specific license conditions related to activities at the mill processing buildings, and/or operations. In addition, the reclamation has reduced the radiological hazards present at the mill site. Therefore, it is appropriate that many of the license conditions should be removed.*"

The reduced requirements for the occupational RPP in Amendment 21 were defined in Table 3 of the January 9, 1995 license amendment request which became the tie-down document cited in LC 35A of Amendment 21. In both Amendments 16 and 21, occupational RPP requirements were defined in respective versions of "Table 3" as provided in corresponding tie-down amendment requests. Table 3 defines occupational radiation monitoring parameters and frequencies, along with corresponding standard operating procedure (SOP) numbers. Differences in occupational RPP requirements between Amendment 16 and 21 can be identified by comparison of respectively different versions of Table 3 shown in Figures 1 and 2 below. When Amendment 21 was issued in 1995, there was a failure to update LC 10 to remove the 1993 tie-down document containing the previous version of Table 3 (from Amendment 16) for consistency with the reduced occupational RPP requirements reflected in the revised, 1995 version of Table 3 as approved by NRC in LC 35(A). In other words, Amendment 21 contained two separate definitions of the same occupational RPP, and these definitions (two separate versions of Table 3) did not match one another. Nevertheless, it was clear in the NRC's letter of approval for Amendment 21 that the requirements of LC 35(A) pertaining to the occupational RPP were intended to supersede corresponding specifications of LC 10 as approved two years earlier in Amendment 16.

In 1995, HMC implemented the reduced scope of the occupational RPP in accordance with HMC's January 9, 1995 amendment request as the tie-down document for LC 35(A), and Table 3 from that tie-down document (Figure 2 below) has been the basis for the occupational RPP at the HMC Site ever since. In 1998, LC 35(A) was modified in Amendment 31 to include only unrelated groundwater monitoring program specifications. Once again, the amendment (Amendment 31) failed to update LC 10 to incorporate the 1995 version of Table 3 from Amendment 21. Reference to the 1993 tie-down document for the RPP (from Amendment 16) improperly remains in LC 10 today, including the 1993 version of Table 3 which has not been applicable to Site operations since decommissioning of mill facilities and windblown soil cleanup were completed in 1995.

In 2018, the RPP Manual was developed to formally define and provide more detail on the scope of the RPP and associated SOPs. The objective was to help ensure compliance with radiation protection requirements of the license and applicable regulations. The occupational radiation monitoring specifications of the RPP Manual are appropriately based on the 1995 version of Table 3 as approved by NRC in LC 35(A) of Amendment 21. While this basis technically conflicts with the current reference to the 1993 version of Table 3 in LC 10, HMC believes it necessary, and hereby formally requests, that NRC administratively amend LC 10 to replace the 1993 tie-down document with the 1995 tie-down document [per LC 35(A) of Amendment 21] such that only the correct, 1995 version of Table 3 applies to LC 10 moving forward.

In effect, there has not been a permanent Restricted Area at the Site since 1995. Restricted Areas have since represented temporary restrictions on access to a specific work area under a Radiation Work Permit (RWP) when issued by the RSO for non-routine activities involving contact/exposure to tailings or other radioactive materials. Since license Amendment 21 was issued in 1995, access to operational portions of HMC property has been controlled with physical barriers (fencing) and warning signage along a "Controlled Area" perimeter, and for routine operations, contamination surveys of personnel and equipment is not required when leaving the Controlled Area. These changes to the occupational RPP (via Amendment 21) resulted in major reductions in RST duties versus those required for a full-time RST position at an operational uranium mill as identified in NRC Regulatory Guide (RG) 8.31 (USNRC, 2002).

RST duties at the Site have not required a full-time daily time commitment since 1995, and prior to the NRC's spring 2017 Site inspection, the NRC did not require strict adherence to the RST qualifications specified in RG 8.31. The former approach to regulatory oversight was consistent with Amendment 21 reductions in RPP requirements based on reduced radiological risks following permanent isolation of mill debris and windblown

soil contamination, and was also consistent with the specifications of 10 CFR 20.1101(a) which stipulate that the scope of the RPP should be commensurate with the radiological risks that are present.

NRC's discussion of the rationale for RSI #1 essentially contends that completion of mill decommissioning and remediation of windblown soil contamination has not appreciably reduced radiological risks at the Site based on information contained in NUREG-2150 "*Proposed Risk Management Regulatory Framework*" for In-situ Recovery (ISR) facilities, and NUREG-0706 "*Final Generic Environmental Impact Statement on Uranium Milling*". While it is true that groundwater contamination, tailings management, and radon emissions are all still present at the HMC Site, radiological risks to public health and the environment during conventional milling operations are not comparable to the risks present following completion of mill decommissioning and soil cleanup. Once conventional mill tailings, contaminated soils, and mill demolition debris are consolidated in permanent isolation from the active surface environment, exposure pathways are greatly reduced or eliminated, and in accordance with 10 CFR 20.1101(a), this circumstance justifies reductions in radiation protection requirements such as those approved by NRC for the HMC Site in 1995.

RST duties and responsibilities at the HMC site have essentially remained static since 1995, and HMC is not requesting a change or reduction in current RST duties and responsibilities. HMC seeks approval only of an appropriate reduction in the qualifications needed for the RST position because the education, training and experience recommendations in RG 8.31 were intended for a fulltime RST at an operational uranium mill, and such qualifications are difficult to meet and are unnecessary to ensure an effective and regulatorily compliant RPP at what is now primarily a groundwater reclamation and environmental monitoring facility.

REFERENCE

U.S. Nuclear Regulatory Commission (USNRC). 1995. Reduction to Radiation Monitoring Requirements, Source Material License SUA-1471, Homestake Grants Mill. ADAMS Accession No. ML080030063.

Table 3 Homestake Occupational Monitoring Program (8-93)

Type of Sample	Number	Locations	Method	Frequency	Analytical Parameters
Work Area Air Sample	As required by RWO	As required by RWO	HP-1 (50/L/min or eq.)	As required by RWO	Alpha, U-nat
Work Area Sampler Calib.	All in use	na	HP-1	Quarterly	Flow rate
Lapel Personal Air Sample	As required by RWO	As required by RWO (2 L/min or eq.)	HP-1	As required by ROW	Alpha, U-nat
Lapel Personal Air Sampler Calibration	All in use	na	HP-1	Monthly	Flow rate
Removable Alpha	Variable	Lunch Rms, Change Rms In Use	HP-2	Weekly	Removable Alpha
ase of Equip.	As needed	Potentially Contam. Equipment and Materials	HP-4	All Items	Alpha, beta gamma
Mill Gamma Survey	None	None	See Personnel Gamma (TLD)	none	none
ALARA	na	As required by RPA	HP-6	na	As required by RPA
Respiratory Protection	As required by RWO	As required by RWO	HP-7	na	na
Bioassay	As required by RWO	As required by RWO	HP-8	Baseline, Monthly during mill decommis-sioning, termination Semi-annual after mill decommissioning	U-nat in urine
Radon in Mill	As required	As required by RWO	HP-9	As required by RWO	Rn Daughters
ument uration	Variable	Radiation Detection Instruments in use	HP-10	6 months or less	na
Personnel Gamma (TLD)	Variable	Personnel	HP-11	Quarterly	Gamma
Personnel Contam.	Variable	Personnel from process buildings	HP-12	Every work day	alpha
Mill Inspection	na	Process buildings	HP-13	Daily under RWO's, Quarterly when no RWO's	visual
Radiation Protection Training	As required	Mill Site	HP-14 Taught by RPA (certified individual) subjects as per Reg Guide 8.31	Initial & annual refresher	Training Class & Written Test

HP-# = Homestake procedure number; RPA = Radiation Protection Administrator; RWO = Radiation Work Order; TLD = Thermoluminescent Dosimeter

Figure 1: 1993 version of Table 3 – occupational radiation monitoring program for mill decommissioning and soil cleanup (per LC 10, Amendment 16).

Table 3 Homestake Occupational Monitoring Program (1-95)

Type of Sample	Number	Locations	Method	Frequency	Analytical Parameters
Lapel Personal Air Sample	As required by RWO	As required by RWO (2 L/min or eq.)	HP-1	As required by RWO	Alpha, U-nat
Lapel Personal Air Sampler Calibration	As required by RWO	na	HP-1	As required by RWO	Flow rate
Release of Equip.	As required by RWO	Potentially Contam. Equipment and Materials	HP-4	As required by RWO	Alpha, beta gamma
ALARA	na	As required by RPA	HP-6	na	As required by RPA
Respiratory Protection	As required by RWO	As required by RWO	HP-7	na	na
Bioassay	As required by RWO	As required by RWO	HP-8	Baseline, termination and semi-annually	U-nat in urine
Instrument Calibration	Variable	Radiation Detection Instruments in use	HP-10	6 months or less	na
Personnel Gamma (TLD)	Variable	Personnel	HP-11	Quarterly	Gamma
Personnel Contam.	As required by RWO	As required by RWO	HP-12	As required by RWO	alpha
Radiation Protection Training	As required	Mill Site	HP-14 Taught by RPA (certified individual) subjects as per Reg Guide 8.31	Initial & annual refresher for people working with groundwater or physical work with tailings sand/ slimes	Training Class & Written Test

Figure 2: 1995 version of Table 3 - Occupational radiation monitoring program following completion of mill decommissioning and windblown soil cleanup [per LC 35(A), Amendment 21].

b. Provide details on what, if any, duties and responsibilities will no longer be assigned to the RSTs under the proposed reduced training and qualifications program. Identify which of these duties and responsibilities will be reassigned and what will no longer be required.

HMC Response: Since the NRC's 1995 approval of reductions in the scope of the occupational RPP at the Site (per license Amendment 21), the duties and responsibilities for the RST role, including environmental radiation monitoring responsibilities, have essentially remained static over the past 25 years. HMC has no plans to change or further reduce RST duties or responsibilities and seeks approval only of a reduction in the qualifications needed for this role as the education, training and experience recommendations in RG 8.31 were intended for a fulltime RST at an operational uranium mill, and such qualifications are difficult to meet and are unnecessary as noted in part (a) above.

c. Provide an overview of HMC's compliance history at the GRP going back at least five years. Summarize any violation and enforcement action in the areas of radiation safety and environmental compliance and whether the licensee or NRC identified the potential or actual violation(s).

HMC Response: Summary descriptions of cited/uncited violations or identified regulatory deficiencies related to the RPP, including both occupational and environmental radiation monitoring programs, over the past five years are provided below. The historical and regulatory context, along with any corrective actions, are also described, where applicable.

2016 Radon Flux NOV

During the August 23-25, 2016 NRC Site inspection, the NRC informed HMC of a potential violation for exceedance of the radon flux standard on top of the LTP. On September 8, 2016 HMC submitted a "specific corrective action plan (SCAP)" to the NRC to proactively address the potential violation (ML16253A143). In accordance with the SCAP, between February and April of 2017, HMC placed approximately 17,000 cubic yards of additional interim cover in targeted regions of the top of the LTP based on flux measurements and gamma survey data collected in 2016.

On April 20, 2017, the NRC issued Inspection Report 040-08903/2016-001 and Notice of Violation (NOV). The NOV had three components: 1) failure to collect a sufficient number of annual radon flux measurements in accordance with EPA Method 115, 2) failure to calculate annual average flux values in a manner consistent with EPA Method 115, and 3) failure to maintain radon emissions on the top of the LTP below the radon flux standard given in Criterion 6 of 10 CFR 40, Appendix A.

On September 13, 2017, HMC submitted a letter to NRC (ML17264A070) with proposed corrective actions to address all three components of the April 20, 2017 radon flux NOV (ML17088A761). NRC's October 16, 2017 reply (ML17292A953) indicated that HMC's proposed corrective actions for the first two NOV components, including the number of radon flux measurements to be taken annually, and the method for calculation of average radon flux, should be used by HMC until a longer-term solution to address the third NOV component (exceeding the flux standard) is identified. Proposed procedures for the first two NOV components have since been followed, and compliance with the first two components of this NOV has since been maintained.

The proposed corrective action to address the third component of the radon flux NOV (exceedance of the radon flux standard) as provided in HMC's September 13, 2017 submittal (ML17264A070), was in the form of a request for an exemption as described in 10 CFR 40.14(a), in this case an interim exemption from the radon flux standard until groundwater restoration is completed. On a September 27, 2017 teleconference between NRC and HMC, NRC indicated that more detailed information was needed to permit a formal technical review

and made it clear that any regulatory pathway that would allow for interim exceedance of the radon flux standard until placement of final cover is completed, would require demonstration of compliance with public dose limits per 10 CFR 20.1301 and 20.1302. Due to outstanding requests for additional information (RAIs) from NRC concerning HMC's historic method of determining public dose from radon have not been resolved, the third component of the April 20, 2017 radon flux NOV (exceeding the flux standard on top of the LTP) has not been resolved. HMC's May 22, 2020 submittal on the matter (ML20147A648), was interpreted by NRC as a contested violation and the matter is currently under regulatory review.

2017 RST Training Deficiency

During the April 24-26, 2017 NRC Site inspection, the inspection team's health physics (HP) specialist noted and informally discussed with the newly appointed RSO that the two RSTs at that time did not meet the qualifications specified in RG 8.31, indicating that this was a technical deficiency in the program despite the absence of operational milling facilities. The NRC did not issue an NOV or non-cited violation regarding this issue, and while not documented in the inspection report (ML18115A480), the HP inspector requested that the RSO put together a training plan to attempt to remedy the apparent deficiency.

On May 12, 2017, the RSO emailed a proposed RST training plan to the NRC's HP inspector (Attachment A) and HMC began implementation. In the following NRC Site inspection (September 13-14, 2017), the NRC reviewed the special RST training log and noted in the inspection report (ML17353A414) that HMC had provided 10 RST training sessions since May 2017 in accordance with the licensee's commitment on this matter. The following spring, just prior to the March 26-28, 2018 NRC Site inspection, the RSO sent an internal memo to HMC's Site Closure Manager a progress report documenting 53 hours of specialized RST training, and recommended discussion of the status with NRC at the upcoming inspection to propose that given the limited scope of RST responsibilities at the Site, the RST training completed to date was more than adequate to ensure effective performance of RST responsibilities, and that additional training would be redundant and of no additional value in terms of RST performance or compliance with applicable regulations (Attachment B).

Accordingly, at the March 26-28, 2018 NRC Site inspection, this issue was discussed with the same HP inspector, and the RSO understood there to be NRC concurrence that the RST training completed to date was adequate and could be discontinued. While this outcome was not documented in the NRC inspection report (ML18115A480), the report stated that the radiation protection program was "*in compliance with license and regulatory requirements*" and HMC believed the matter to have been closed by NRC.

A year later, during the March 18-21, 2019 NRC Site inspection, a different NRC inspection team performed the inspection, and HMC was cited with a Level IV violation for failure to follow the guidance set forth in Regulatory Guide 8.31 under LC 32, including a failure to "*provide three months of specialized training to its radiation safety technicians*" (ML19129A405). The RSO attempted to explain the previous (2017) efforts to resolve the RST training issue as described above, and noted that a license amendment request to modify LC 32 with reference the RPP Manual instead of generic references to NRC guidance documents was under regulatory review, but a violation regarding compliance with LC 32 was nevertheless issued.

2017 Waste Disposal Procedure NOV

The April 24-26, 2017 NRC Site inspection identified a Level IV violation for failure to follow LC 23, which requires HMC to establish standard procedures for all activities involving radioactive materials that are handled, processed, or stored, including a failure to establish written procedures for 1) disposal of wastes in the onsite disposal pit on the small tailings pile (STP), 2) operating the 1,200 gallon per minute (gpm) zeolite cleanup system, and 3) operation of the evaporation ponds. HMC's corrective action to develop written SOPs

for these activities (ML17223A189) was accepted by NRC after review of the new SOPs at the March 26-28, 2018 Site inspection and the NOV was closed out by NRC (ML18115A480).

2017 Unresolved Item Regarding Internal Dose Monitoring

The September 13-14, 2017 NRC Site inspection identified an unresolved item related to regulatory compliance with 10 CFR Part 20 requirements for internal occupational dose monitoring. During the Site tour NRC inspectors noted maintenance work being performed on the 1200 gpm zeolite water treatment facility on top of the LTP without a radiation work permit (RWP). An RWP was intentionally not issued by the RSO for this work based on a previous conservative generic dose assessment for work at the zeolite facilities showing very low potential for doses to workers, and because the scale and duration of the work was incorrectly understood by the RSO to be smaller than actually required (due to a miscommunication between the RST and RSO). This event led to a larger question and request by the NRC for HMC to analytically characterize routine occupational exposures at the Site to verify that occupational air monitoring and internal dose estimation is not required under 10 CFR 20.1502(b)(1) criteria for occupational radiation monitoring. HMC subsequently developed, in consultation with NRC, an occupational exposure study plan that included monitoring of air particulates, airborne radon and radon progeny, and ambient gamma dose rates. HMC implemented the study between December 2017 and May 2018, and the results showed that the maximum expected occupational dose was on the order of 53 mrem/yr, well below the 500 mrem/yr threshold that requires occupational monitoring under 10 CFR 20.1502(b)(1). A final report for the study was reviewed by NRC at the August 27-30, 2018 NRC Site inspection, and the unresolved item was closed out by NRC (ML18303A199).

2019 NOV Concerning Compliance with LC 32

As indicated in the preceding discussion regarding the 2017 RST Training Deficiency, during the March 18-21, 2019 NRC Site inspection, a new NRC inspection team performed the inspection, and HMC was cited with a Level IV violation for failure to follow the guidance set forth in Regulatory Guide 8.31 under LC 32, including a failure to 1) conduct weekly RSO inspections of all facility areas, 2) perform daily RST walk-through inspections of all work and storage areas, 3) provide three months of specialized training to its radiation safety technicians, and 4) conduct fire drills on a semi-annual basis. The RSO attempted to explain the previous (2017) efforts to resolve the RST training deficiency (item 3) as detailed earlier and noted that a license amendment request to modify LC 32 with reference to the RPP Manual instead of generic references to NRC guidance documents was under regulatory review, but a violation regarding compliance with LC 32 was nevertheless issued.

A number of experienced HMC personnel have served effectively in the RST role at the Site since completion of mill decommissioning and windblown soil cleanup in 1995, despite lacking some of the educational and training qualifications recommended in RG 8.31. It should be noted that among the three NRC guidance documents generically cited in LC 32 (RG 8.22, RG 8.30, and RG 8.31), there are numerous specifications that do not apply in the absence of an operational mill (e.g. airborne yellowcake monitoring, routine Restricted Area surveys, radiation protection protocols for specific milling process operations, etc.) but remain in HMC's license, unresolved.

In 2019, HMC attempted to remedy this circumstance with a license amendment request to replace LC 32 references to NRC guidance documents with reference to the RPP Manual, such that non-applicable specifications in the NRC guidance documents would be eliminated from license condition requirements, but the NRC rejected further review of the application, citing issues with the approach and certain specifics contained within the RPP Manual. HMC has not pursued further attempts to amend the license with respect

to LC 32, and HMC continues to follow the basic RPP elements that were approved by NRC with issuance of Amendment 21 in 1995 [i.e. LC 35(A) of Amendment 21].

The applicability of RG 8.31 specifications and NRC's historic approach to regulatory oversight with respect to LC 32 requirements appear to have been overlooked in the 2019 decision to issue a violation concerning the adequacy of RST training qualifications relative to RG 8.31 specifications. Again, HMC is not requesting a reduction in current RST duties and responsibilities, only a reduction in the qualifications required for this position as RG 8.31 specifications are intended for active milling operations, and meeting these criteria is difficult and unnecessary to ensure an effective RPP in compliance with applicable regulations.

With respect to corrective actions for this NOV: 1) weekly inspections are now conducted by the RSO or Assistant RSO (ARSO), 2) daily walkthrough inspections are conducted by the RST[1], 3) one of the RSTs has since attained a college degree and completed a 40-hour RSO training course to meet the specifications of RG 8.31[2], and 4) fire drills are now conducted semiannually. Based on NRC review of these corrective actions during the July 22-30, 2020 Site inspection, this NOV was closed out (ML20241A110).

2019 NOV for Failure to Verify Calibration of an Instrument Prior to Onsite Use

During the October 22-24, 2019 NRC Site inspection, a Level IV violation was identified for to failure to verify that a Ludlum Model 3030 scaler instrument had been properly calibrated prior to onsite use as there was an identified discrepancy between the calibration label on the instrument and the instrument serial number on the calibration certificate. This turned out to be a typographical error on the instrument's calibration label in which two digits in the serial number were inadvertently transposed from that listed in the calibration certificate. However, the licensee failed to verify with the calibration vendor that this was a documentation error before placing the instrument back in service. Upon issuance of the NOV, HMC corrected the data transcription error and produced instrument calibration records verifying that the instrument had been properly calibrated prior to use at the Site. Based on NRC's review of the new information, the issue was recharacterized as a minor violation and the NOV was closed out (ML20017A180).

RSI #2

a. Provide the education requirements for new RSTs and more details regarding the training and qualification requirements.

HMC Response: The minimum education requirement for a new RST will be a high school diploma or equivalent, along with the 40-hour HAZWOPER training required for all HMC employees. Specific RST training requirements will include successful completion of at least 40 hours of general health physics training relevant to uranium recovery facilities, including basic radiation science, radiation protection principles and basic regulations. In addition, after completing 40 hours of generally applicable health physics training, any new RST candidate must receive the general radiation protection training given to all new employees (approximately 2 hours), along with an additional 2-3 hours of Site-specific RST training from the RSO that pertains specifically to the RPP at the Site to include the following subjects:

[1] License Condition 32 was amended on June 24, 2020 (ML20147A107) to allow HMC staff designated by the RSO to perform daily walkthrough inspections when the RST is not available (e.g. weekends, holidays, sick leave, etc.).

[2] The former primary RST at the Site, with many years of experience in this role, is no longer qualified to perform this function under RG 8.31 criteria. This circumstance has adversely affected HMC's ability to provide continuous RST coverage on weekends, holidays, vacations, sick leave, etc.

1. Applicable regulations and license conditions
2. Radiological hazards
3. RPP Manual
4. Occupational radiation monitoring program
5. Environmental radiation monitoring program
6. Radiation measurements and instruments
7. Standard operating procedures
8. RWPs and FLRAs
9. Daily RST walkthrough inspections
10. Documentation and records retention
11. Administration of radiation protection training for contractors
12. Regulatory inspections

Additional subjects deemed relevant by the RSO may also be covered during the Site-specific RST training. A separate exam will be given for the general radiation protection training and the Site-specific RST training with a minimum acceptable score of 70% on each exam. This RST training will be documented. The above training will be followed by at least two weeks of on-the-job training with respect to RST duties, to be administered by the existing RST and overseen by the RSO and ARSO. Requirements for any new RST candidate will also include a three-month probationary performance review period to be jointly evaluated by HMC radiation protection staff (RSO, ARSO and RST). Upon completion of the performance review period, a consensus recommendation from the radiation protection staff will be made to the Closure Manager and Health, Safety and Environmental Superintendent for consideration of a permanent RST appointment. Previous applied experience with the principles and implementation of RPPs at facilities with a radioactive materials license may be substituted for a portion of the on-the-job training requirement at the discretion of the RSO. Experience with uranium recovery facilities is preferred but not mandatory.

The above training and qualification requirements for the RST role have expanded from HMC's original, August 12, 2020 request to amend the license with respect to LC 32 and the qualifications required for the RST position (ML20225A272). Accordingly, the amendment request has been revised and is re-submitted in conjunction with these RSI responses.

b. Provide the criteria that will be used to determine what level of training and qualification the individual will be required to complete based on education level. If differing levels of formal education will warrant differing levels of training and qualification requirements, describe those as well.

HMC Response: See response to part (a). A high school diploma (or equivalent) and successful completion of the required training as specified above is expected to be adequate to enable a capable candidate RST to effectively perform RST duties and responsibilities at the Site. If during the RST performance review period it becomes apparent to the RSO that the new RST candidate, aside from meeting the above qualifications and training requirements, exhibits deficiencies or limitations in job performance or competency that could compromise radiation safety or jeopardize regulatory compliance, this information will be reflected in the recommendation provided to the Closure Manager and Health, Safety and Environmental Superintendent for determination of a permanent appointment to the RST position at the Site.

c. Provide the details on the subjects that will be covered in training and the number of hours for each subject (math, physics, radiation protection, sampling, etc.).

HMC Response: See response to part (a). There will not be quantitative requirements for the number of hours allocated to each topic to be covered in the 40 hours of generally applicable health physics training, the two hours of general radiation protection training, the 2-3 hours of Site-specific RST training, or over the course of the two weeks of on-the-job training.

d. Provide the justification for deviating from the Regulatory Guide 8.31 guidance associated with education, training and experience qualifications required for fully operational uranium recovery facilities versus the operations at the GRP.

HMC Response: See response to RSI #1(a).

e. Provide details regarding how these different training and qualification requirements will continue to provide adequate protection to the public as they relate to the current duties of the RSTs as required by 10 CFR 40.45 (referring to 10 CFR 40.32).

HMC Response: The vast majority of licensed radioactive materials at the Site are permanently isolated from the surface environment in engineered containment facilities, and radiological risks to public health and danger to life or property (per 10 CFR 40.32) are very low based on relevant information from NUREG-2150[3] and NUREG-0706[4]. The stated primary objective of RG 8.31 is occupational radiation protection and maintaining worker exposures/doses from uranium and its progeny at levels that are as low as reasonably achievable (ALARA). As also stated in RG 8.31: "*Specific guidance regarding protection of the public from radiologic and toxic hazards caused by materials in effluents to unrestricted areas is beyond the scope of this guide*." Accordingly, the objectives of the training and qualification requirements for the RST under LC 32 are technically not intended to address public health or danger to life or property.

However, the scope of the RPP as defined in the RPP Manual goes beyond RG 8.31 to include environmental effluent monitoring and underlying objectives for protection of public health and the environment. It is reasonable to assume that RST qualifications and training sufficient to ensure effective implementation of the overall RPP and associated SOPs will fulfill the performance and regulatory compliance objectives related to protection of members of the public from routine radiological effluent emissions (e.g. radon) and non-routine (unplanned) releases of low-level radioactive material from engineered containment facilities (e.g. tailings impoundments, evaporation ponds, groundwater extraction and conveyance systems, etc.). The requirements of 10 CFR 40.45 and 40.32 pertain to license applications, and over the history of the HMC Site, the approved RPP as defined in applicable license conditions has proven effective for ensuring compliance with applicable radiation protection regulations, including ALARA objectives pertaining to public health and the environment.

RSI #3

Provide details on the criteria that will be used for each candidate to demonstrate proficiency to the satisfaction of the Radiation Safety Officer (RSO) including: (1) the criteria that the RSO will use to evaluate the individual's

[3] From NUREG-1250: "Uranium recovery facilities are of low radiological risk to workers and members of the public under normal operational conditions and most accident scenarios."

[4] From NUREG-0706: "Long and sustained exposure to radioactivity in the tailings pile would be required to produce detectible adverse effects. If degradation or failure of isolation were to occur, it would not lead to catastrophic radiation effects."

proficiency and performance; (2) the areas in which the candidate must demonstrate proficiency; and, (3) details on what criteria would be acceptable to demonstrate proficiency.

HMC Response: As indicated in the amendment request, the criteria for demonstrating acceptable performance with respect to the RST candidate's knowledge of the RPP and proficiency in performing RST duties, will be based on specific elements and requirements defined in the RPP Manual and associated SOPs, including operation of radiological instruments, surveying and sampling techniques, and associated records keeping. The RPP Manual and SOPs will provide the framework for evaluation of the candidate's capabilities during the on-the-job training and RST performance review period. This evaluation will be qualitative in nature and as previously indicated, will include joint consideration of the candidate's performance and capabilities by HMC's radiation protection staff (RSO, ARSO and existing RST). There will not be an exam or any quantitative criteria for evaluation of the candidate's suitability for the RST position during the on-the-job training or RST performance review period, and recommendations from HMC radiation protection staff will be provided to the Closure Manager and Health, Safety and Environmental Superintendent for consideration of a permanent appointment to the RST position.

RSI #4

a. *Describe the components of the training and qualification program that will ensure the RSTs are able to act independently during normal and abnormal situations onsite, due to the location of RSO and Assistant Radiation Safety Officer (ARSO) offsite.*

HMC Response: The ability (and responsibility) of the RST to act independently will be covered in the Site-specific RST training described in response to RSI #3(a) above. In the event of upset conditions that urgently require evaluation and direction from the RSO, the RST will communicate by phone with the RSO and/or ARSO, and if onsite presence is needed, either can generally mobilize to the Site within several hours. In the event that the RSO or ARSO cannot immediately be reached by phone, the RST will contact the Health, Safety, and Environmental Superintendent and/or Closure Manager for further advising and instruction.

The NRC's discussion of the rationale for RSI #4 incorrectly cites repair work on the zeolite treatment cell embankments during the NRC's September 13-14, 2017 Site inspection as an example of RST failure to recognize a potential radiological hazard for airborne exposures. As indicated in response to RSI #1(c) above, an RWP was not issued for the project because the RSO had previously performed a conservative generic dose assessment for work at the zeolite facilities showing very low potential for occupational doses to workers, and while the RST properly contacted the RSO for a determination of the need for an RWP or other radiological controls for this maintenance work, there was a miscommunication regarding the scale and duration of the work to be performed. The RSO directed contamination surveys for personnel and equipment involved in the zeolite embankment work but did not issue an RWP or air monitoring based on the previous dose assessment and the RSO's understanding of the scale and duration of the work. This was not a failure of radiological hazard recognition by the RST, and the miscommunication between the RST and RSO has since been addressed through modification of the RPP Manual regarding the level of detailed information needed for non-routine projects and associated FLRA protocols.

While the RST is trained to recognize abnormal exposure or potential release circumstances and to act independently within the scope of the RST's level of training and experience under the RPP, remote RSO/ARSO oversight of radiation protection at the Site is not a barrier to continual lines of communication and rapid RSO evaluation/response to significant radiological exposures, unplanned radioactive material releases, or other issues pertaining to radiation protection at the Site.

b. Provide details on any guidance or documentation that directs the RST to stop work or contact the RSO or ARSO.

HMC Response: See response to part (a) above. Also, all HMC staff that work in the Controlled Area have the authority to stop work if upset conditions occur that could result in non-routine exposures or accidental release of radioactive material, along with a responsibility to notify the RSO, ARSO, RST and/or Closure Manager and Health, Safety and Environmental Superintendent for evaluation and further instruction.

c. Provide details on any hazard recognition or emergency response training provided to the RSTs to allow these individuals to act independently to protect health, safety and the environment.

HMC Response: See response to part (a) above. In addition, like all HMC employees, the RST is required to be trained to the 40-hour HAZWOPER standard (which includes general information on emergency response), and to also have read and understand the Site-specific emergency response requirements of SOP-1 (*Emergency Response Procedure*) and SOP-21 (*Spill Response and Reporting Procedure*).

d. Provide the specialized radiation protection training required by License Condition 24, if RSTs will be expected to approve Radiation Work Permits (RWPs).

HMC Response: The RST does not have the authority to approve RWPs, but the position is an integral part of the hazard recognition and RWP evaluation/development process. As indicated in the RPP Manual, the RST will detail on the Field Level Risk Assessment (FLRA) form, the nature and scope of any non-routine project or activity involving the potential for significant contact with or exposure to tailings or other radioactive materials [e.g. solid or liquid wastes in the evaporation ponds, reverse osmosis (RO) plant, etc.], and will send the FLRA form (along with any project workplans) to the RSO for evaluation. Should the RSO determine that an RWP is warranted for the project, the RST and/or RSO will develop the RWP and the RSO will approve and issue the RWP. The RST will then implement the RWP for the project, including RWP training for workers that will be involved in the work and administration of respective radiation protection and documentation requirements (e.g. establishing a temporary Restricted Area for the work, and performing radiological surveys, monitoring and documentation as specified in the RWP).

RSI #4

a. Provide specific technical training requirements for RSTs that will enable the licensee to meet all of its license requirements, including releasing equipment and packages from the restricted area.

HMC Response: Again, there is no permanent Restricted Area at the Site, but all equipment that may come into contact with tailings or other licensed material is required to be surveyed for unrestricted release before leaving the facility. The RST training requirements detailed in response to RSI #2(a) above, including the 40-hour general health physics training, Site-specific RST training, two weeks of on-the-job training, and specific procedural guidance provided in applicable SOPs, is expected to be sufficient to ensure that all equipment release surveys are performed in accordance with applicable specifications in LC 14 and LC 32.

With respect to release surveys for packages, on rare occasions HMC has a need to ship small quantities of contaminated materials for analytical testing that may exceed U.S. Department of Transportation (DOT) exemption limits for shipping as Class 7 radioactive materials. While the RST is trained to use UN2910 excepted package shipping protocols for this circumstance, including package contamination surveys as required by applicable DOT regulations, this topic is not currently covered in SOP 12 for contamination surveys. SOP 12

will be updated accordingly, and any candidate RST will receive corresponding instruction on UN2910 shipping procedures during the Site-specific RST training and subsequent on-the-job training.

b. Provide RSO oversight responsibilities that will ensure that equipment and packages released from the restricted area will be in accordance with all relevant license conditions.

HMC Response: Documentation of equipment release surveys is reviewed at least monthly by the ARSO as part of the monthly internal ALARA audit, and monthly ALARA audit reports are reviewed/approved by the RSO. The monthly internal ALARA audits are compliant with RG 8.31 specifications and provide assurance that all equipment and packages that require radiological contamination surveys for release from the facility are properly surveyed by the RST in accordance with LC 14 and LC 32 requirements.

ATTACHMENT A

2017 RST Training Plan

Environmental Restoration Group, Inc.
8809 Washington St NE, Suite 150
Albuquerque, NM 87113
ph: (505) 298-4224
www.ERGoffice.com

To: Linda Gersey (NRC)	**Date**: May 12, 2017
From: Randy Whicker (ERG)	**Project**: HMC Grants Reclamation Project
Direct: 970-556-1174	**Task(s)**: Radiation Protection Administrator
Cc: Tom Wohlford (HMC); Chuck Farr (ERG)	
Subject: Training Plan for Radiation Safety Technicians at HMC Grants Reclamation Project	

Dear Mrs. Gersey,

Per our discussions during the recent Nuclear Regulatory Commission (NRC) inspection of the Homestake Mining Company of California (HMC) Grants Reclamation Project site (Site) conducted April 24-26, 2017, this memo provides a plan for additional training for the Radiation Safety Technician (RST) position at the Site. Regulatory Guide 8.31 indicates that a RST with education equivalent to a high-school diploma must also have at least thee months of specialized training in radiation health protection relevant to UR facilities (up to 1 month may be on-the-job training).

After reviewing and discussing the background and existing level of training received by the RST during the April 2017 inspection, the agreed path forward was for HMC to outline a plan to provide seven (7) weeks of appropriate radiation protection training for all individuals that are (or will be) assigned with RST responsibilities on a day-to-day basis at the Site. In addition, you suggested that this training could be truncated at some point if it can be justified and documented that the RST(s) have been adequately trained in all aspects of their radiation protection responsibilities at the Site.

Accordingly, it is proposed that the RPA[1] (Randy Whicker, CHP) and Chuck Farr (ERG)[2] will each visit the Site once per week to provide an appropriate level of specialized training for the RST(s) until such time as they are deemed sufficiently educated with respect to technical and regulatory aspects of the following general and specific topics[3] in order to meet RG 8.31 specifications regarding RST qualifications:

1. General provisions and specific License conditions as specified in the RML
    - Applicable regulatory framework
2. Basic radiation physics
3. External and internal dosimetry

[1] The Radiation Protection Administrator (RPA) is functionally equivalent to the RSO position as described in RG 8.31.

[2] Chuck Farr an ERG Operations Manager with decades of experience with radiation protection principles and procedures, including years of consulting assistance with the design and implementation of radiation protection and environmental monitoring programs at the HMC Grants Reclamation Site.

[3] Other qualified professional health physicists from ERG may occasionally be utilized to supplement this additional training depending on availability and schedules of the RST(s) and/or the primary trainers specified herein.

4. Radiation measurements and instruments
5. Radiation protection program (RPP):
    - Applicable regulatory framework
    - Applicable regulatory guidance
    - Radiological hazards for routine and non-routine Site reclamation and decommissioning operations.
    - Standard operating procedures (SOPs) under the RPP:
        - Radiation safety work rules
        - Worker training
        - Instrumentation
        - Radiological contamination surveys
        - Occupational dose monitoring
        - Public dose monitoring
    - Data review and assessment
6. Environmental monitoring program.
    - Applicable regulatory framework
    - Environmental media
    - Environmental monitoring techniques
    - Environmental sampling techniques
    - Data review and assessment
7. Indirect yet generally relevant ancillary subjects as deemed appropriate by the RSO

This weekly training will be documented and trainee progress will be monitored and continually evaluated by the RPA. Should the RST(s) attain sufficient command of the subjects covered to meet the intent of the qualifications indicated in RG 8.31 for the position prior accumulating a full seven weeks of training, I will contact you to discuss termination of this additional training. Upon NRC concurrence that the that RST qualifications have been met, the normal schedule for annual radiation safety refresher training required for the RST position will resume.

Please note that the proposed target schedule of two onsite RST training sessions per week may vary somewhat depending on operational responsibilities for these individuals as well as on trainer schedules, but every effort will be made to achieve consistency with this target training frequency.

Please let me know if you have any questions, any suggestions for revision of this basic training plan, or if you need further information concerning this matter.

Regards,

Randy Whicker, CHP
Radiation Protection Administrator
HMC Grants Reclamation Project

Environmental Restoration Group, Inc.
8809 Washington St. NE, Suite 150
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Email: RandyWhicker@ergoffice.com
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ATTACHMENT B

Internal Memo Regarding RST Training Progress

Environmental Restoration Group, Inc.
8809 Washington St NE, Suite 150
Albuquerque, NM 87113
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TECHNICAL MEMORANDUM	
To: Tom Wohlford (HMC)	**Date**: March 25, 2018
From: Randy Whicker (ERG)	**Project**: HMC Grants Reclamation Project
Direct: 970-556-1174	**Task(s)**: Radiation Safety Officer
Cc: William Archuleta (HMC), Kyle Martinez (HMC); Chuck Farr (ERG)	
Subject: Review, evaluation and status update concerning radiation protection training for Radiation Safety Technicians	

Dear Mr. Wohlford,

Per the Training Plan for Radiation Safety Technicians (RSTs) at the Homestake Mining Company (HMC) Grants Reclamation Project site (Site) (ERG, 2017) as developed from discussions with Linda Gersey of the U.S. Nuclear Regulatory Commission (NRC) during an onsite inspection conducted April 24-26, 2017, this memorandum describes a review, evaluation and current status update concerning the training performed to date for RSTs at the Site (53 hours of formal training since May 2017). Based on the results of this review as documented in this Technical Memorandum, I recommend discussions with Linda Gersey at the upcoming Site inspection concerning my opinion that the training received at this point is adequate for the RSTs (William Archuleta and Kyle Martinez) to effectively perform their radiation safety and radiological monitoring duties at the Site, and that further specialized RST training would not significantly benefit the Radiation Protection Program. Provision for truncation of this special training was included in the original RST Training Plan (ERG, 2017).

In addition, I would propose discussion with Ms. Gersey regarding HMC's future plans to amend Condition 21 of NRC Radioactive Materials License SUA-1471 (Amendment 49) for specificity regarding the appropriate amount of training to qualify for the responsibilities required for the RST role as defined in the new Radiation Protection Program (RPP) Manual (HMC, 2018), and how this definition is consistent with the intent of NRC guidance as cited in License Conditions 21 and 32 (i.e. NRC Regulatory Guide 8.31).

Please let me know if you have questions or need more information.

Thanks,

Randy Whicker, CHP
Radiation Safety Officer,
HMC Grants Reclamation Project

Environmental Restoration Group, Inc.
8809 Washington St. NE, Suite 150
Albuquerque, NM 87113
Email: RandyWhicker@ergoffice.com

Status and Assessment of Training Requirements for the RST Role

1. Background and Objectives

As informally requested by Linda Gersey of the U.S. Nuclear Regulatory Commission (NRC) during an onsite inspection conducted April 24-26, 2017, the Radiation Safety Officer (RSO) (Randy Whicker), along with a qualified health physics professional from Environmental Restoration Group (ERG) (Chuck Farr), have since conducted approximately 53 hours of formal, specialized radiation protection training for the Radiation Safety Technician (RST) role at the Homestake Mining Company (HMC) Grants Reclamation Project site (Site). Currently, there are two RSTs at the Site (William Archuleta and Kyle Martinez).

This Memorandum documents the degree of RST experience gained at the Site in recent years along with the specialized radiation training conducted since May 2017 for this role, including content relative to the proposed Training Plan (ERG, 2017), adequacy with respect to the objectives of the Training Plan, and as commensurate with the low levels of radiological hazards present at the Site and scope of RST duties under a newly developed Radiation Protection Program (RPP) Manual (HMC, 2018).

License Conditions (LC) 21 and 32 of NRC Radioactive Materials License SUA-1471 (Amendment 49) for the HMC Grants Reclamation Project reference NRC Regulatory Guide 8.31 with respect to RSO qualifications and activities pertaining to radiation protection, and this guidance specifies 3 months of "specialized training….in radiation health protection relevant to UR facilities" for RST qualifications when the individual has only a high school diploma. However, the HMC Grants Site is not "full-scale operating UR facility", the RST role is not a full-time position as described in Regulatory Guide 8.31(Section 2.4.2), and the radiological hazards present are not similar. Uranium milling facilities no longer exist at the Site, contaminated soils across most land areas impacted by historic milling operations have been cleaned up and isolated from the environment in accordance with NRC-approved standards, and groundwater remediation and environmental monitoring are the primary remaining objectives of Site operations.

The New RPP Manual formally defines the scope and technical details of the Radiation Protection Program in this operational context (i.e. remedial objectives with low potential for radiological hazards), including minimum qualifications that are appropriate for the RST role at the Site as follows:

> *The preferred credential for the RST position is a 2-year (associates) degree in physical sciences, engineering or a health-related field with an accredited university or community college, though a high school diploma is acceptable provided that the individual has received at least 40 hours of relevant training in basic radiation science, radiation protection principles and applicable regulations, at least two weeks of on-the-job training with respect to RST duties. The RST must demonstrate sufficient working knowledge of health physics principles and proficiency in the operation of radiological instruments used at the facility, surveying and sampling techniques, and associated records keeping requirements. The RST must also attend annual radiation protection refresher training given to all employees by the RSO. Previous applied experience with the*

principles and implementation of RPPs at facilities with a radioactive materials license may be substituted for the above qualifications at the discretion of the RSO. Experience with uranium recovery facilities is preferred. The RST must acquire a thorough working knowledge of all elements of this RPP Manual and associated SOPs.

2. Onsite RST Experience

Under the above definition of appropriate qualifications for the RST role at the Site, both Mr. Archuleta and Mr. Martinez have the necessary qualifications to perform RST duties and have demonstrated the basic skills necessary to implement the RPP onsite and remain in compliance with applicable License Conditions and regulations, including performance of occupational and environmental radiological monitoring requirements (airborne radiation, gamma dosimetry, bioassay sampling and contamination surveys). Both RSTs have over two years of applied experience in the performance of these responsibilities.

3. Specialized RST Training

The specialized RST training proposed to Linda Gersey in May of 2017 to meet the intent of NRC Regulatory Guide 8.31 specifications regarding qualifications for the RST role were initiated on May 18, 2017. A total of 53 hours of radiation protection training have been completed to date in accordance with content specified in the Training Plan. This includes 7 hours of training on the new RPP and respectively updated SOPs. While this amount falls short of the 7 weeks of training as originally proposed, the RSO believes that sufficient training relevant to all aspects of RST duties at the Site have been adequately covered, and that neither the RSTs or the Radiation Protection Program would benefit significantly from additional dedicated RST training (note that this may change if conditions or procedures change in the future).

A copy of the training log showing the dates and number of hours of RST training completed, along with notes on the content of the training, are provided in Attachment 1. The topics covered are consistent with the outline of proposed content of the RST Training Plan (ERG, 2017) and should meet the intent of the training, which was to provide the specialized training in radiation health protection relevant to uranium recovery (UR) facilities as described in NRC Regulatory Guide 8.31. Under the requirements for the RST role as specified in the new RPP (as reproduced above), the amount of training and onsite experience for the RST position has already been met.

4. Proposed License Amendment Regarding RST Training

The rationale for the proposed 7 weeks of specialized RST training as originally discussed with Linda Gersey was a general reference in License Condition 32 to compliance with NRC Regulatory Guide 8.31 as applicable to a full-scale operating UR facility and without consideration given to the level of radiological hazards associated with current Site conditions and the ongoing nature of Site operations (primarily groundwater treatment and environmental monitoring). HMC plans to add specificity to License

Condition 21 with respect to minimum RST qualifications as defined in the new RPP (reproduced above) in a future license amendment request. HMC does not plan to submit an amendment request for this single issue, but along with other needed changes to License Conditions to reflect current Site operations and objectives, including elimination of routine urine bioassay sampling and dosimeter monitoring for workers as these programs consistently indicate an absence of radiological intakes or occupational doses from working at the Site, and the NRC does not require monitoring of doses to workers with no reasonable potential for doses to exceed 500 mrem/yr (10 CFR 20.1502). It is anticipated that this license amendment request will be developed and submitted in mid-to-late 2018, once a number of necessary changes to License Conditions have been identified under the Self Assessment process as required by the Confirmatory Order issued in 2017.

5. Conclusions

Based on the results of this RST training review, the RSO recommends discussions with Linda Gersey at the upcoming Site inspection (scheduled for March 26-28, 2018) concerning the content of this Technical Memorandum since the training conducted to date is adequate to ensure that the RSTs can effectively perform their radiation safety and radiological monitoring functions at the Site, and that further structured RST training would not be of significant benefit to the RSTs or the Radiation Protection Program. It is thus recommended that special RST training be suspended at this point in accordance with respective provisions provided in the original RST Training Plan (ERG, 2017), and with an understanding that additional RST training may be warranted in the future should conditions, equipment or procedures change in a manner that requires such training.

6. References

Environmental Restoration Group, Inc. (ERG). 2017. Training Plan for Radiation Safety Technicians at HMC Grants Reclamation Project. Memorandum sent to Linda Gersey of the NRC on May 12, 2017.

Homestake Mining Company of California (HMC). 2018. Radiation Protection Program Manual. January 2018.

ATTACHMENT 1: HMC GRANTS RECLAMATION PROJECT - 2017/2018 RST TRAINING LOG

HMC GRANTS RECLAMATION PROJECT - 2017/2018 RST TRAINING LOG

Date	RST Name	Instructor	# Hours	Training Topics and Notes
5/18/2017	William Archeleta, Kyle Martinez	Randy Whicker (RSO)	5	Sight tour: 1) EP1 - discussed setting new pumps for turbo misters in EP1 - no RWP needed but need to scan items for disposal (worker PPE, non-working pumps, etc.) and document surface contamination readings for disposal in trenches. 2) Walked through RST key activities onsite (wells, xeolight/RO Plants, POC, EP2 sludge, etc.) and discussed radiological issues associated with duties. 3) Watched at existing video of rad training, occasionally paused video to discuss various subjects in more technical depth.
5/24/2017	William Archeleta, Kyle Martinez	Chuck Farr	4	Involved discussion and hands-on training with the primary instruments used on site (Ludlum Model 19, Ludlum Model 12/43-5, Ludlum Model 12/44-9, and Ludlum Model 3030). Discussion was on instrument type, fundamental such as how they work and how they can break, where they are used and why.
6/2/2017	William Archeleta, Kyle Martinez	Randy Whicker (RSO)	5	Discussions of wells on LTP and past techniques for interim radon cover placement, review of instruments training, in-depth review of radioactive materials license, with emphais on license conditions relevant to RST duties. This lead to instruction on the reasons for contamination surveys and environmental monitoring, radionuclides involved, chemical/physical forms, associated transport mechanisms, half life concepts, and relevance to human dose and environmental impacts.
6/27/2017	William Archeleta, Kyle Martinez	Randy Whicker (RSO)	4	Formal training on external and internal radiation dose to humans, along with related relevant discussions and review of previous training concepts and terminology.
6/27/2017	Kyle Martinez	Chuck Farr	2	Involved discussion and hands-on training related to Clean Area Survey. Why they are performed and at what frequency, what paperwork is involved, and what areas surveyed.
7/6/2017	William Archeleta, Kyle Martinez	Randy Whicker (RSO)	2	Review of basic regulations applicable to radiological aspects of the Site and RML (NRC jurisdiction yet Agreement State), leading to discussions of the nuclear fuel cycle along with NORM and MSHA juristiction for operational mines.
7/21/2017	William Archeleta, Kyle Martinez	Randy Whicker (RSO)	4	Tour of environmental air monitoring stations and review of associated procedures. Visit to zeolite facility and review of related procedures, including discussions of potential occupational dose pathways for uranium in loaded zeolite media and/or contaminated groundwater sources. Visit to former land application areas and discussions of potential public dose pathways.
7/27/2017	William Archeleta, Kyle Martinez	Chuck Farr	4	Review of the hi-vol air-particulate sampling program, air volume calculation spreadsheet, and historical documentation on what and why U-nat, Th-230, Ra-226 analyzed. Discussed 10 CFR 20 App B Table 2, and compared HMC results to published effluent concentration limits in Table 2.
8/18/2017	William Archeleta, Kyle Martinez	Randy Whicker (RSO) and Chuck Farr	6	Review of previous training topics, including discussion of atomic structure, radioactive decay, half life, radioactivity, and how ionization mechanisms govern penetrability of alpha, beta and gamma radiations, and how penetrability relates to detection capabilities with instruments as well as dose. Gave quiz with 40 questions covering previous training topics, followed up with further discussions of concepts that were still not clear to RSTs. The quiz/follow-up discussion approach appears effective for facilitating student understanding and retention versus just lectures.
8/31/2017	William Archeleta, Kyle Martinez	Chuck Farr	4	Review of efficiency calculations, calculation spreadsheet, sources on site, and some routine RCT tasks (additional review of clean area surveys).
12/8/2017	William Archeleta, Kyle Martinez	Randy Whicker (RSO)	4	General Annual Radiation Safety training for all site workers.
2/28/2018	William Archeleta, Kyle Martinez	Chuck Farr	2	Training on new alpha/beta survey instruments (Model 43-93 alpha/beta scintillation detector with Model 2360 ratemeter/scaler) and revised version of SOP 12 [Radiological Contamination Surveys and Decontamination (HP-2)], including use of the new Forms EDF-5 and EDF-15 as indicated in SOP 12 (e.g. survey data and efficiency information are entered into an electronic version of EDF-5 which automatically calculates results in decays per minute).
3/21/2018	Kyle Martinez	Chuck Farr	7	Training on the new RPP, procedures within; specifically the SOP-12, SOP-16, SOP-18, SOP-21 and the associated forms.

ATTACHMENT 2

NRC Form 313

NRC FORM 313 (01-2020) 10 CFR 30, 32, 33, 34, 35, 36, 37, 39, and 40

U.S. NUCLEAR REGULATORY COMMISSION

APPLICATION FOR MATERIALS LICENSE

APPROVED BY OMB: NO. 3150-0120 **EXPIRES: 01/31/2023**

Estimated burden per response to comply with this mandatory collection request: 4.3 hours. Submittal of the application is necessary to determine that the applicant is qualified and that adequate procedures exist to protect the public health and safety. Send comments regarding burden estimate to the Information Services Branch (T-6 A10M), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0120), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

INSTRUCTIONS: SEE THE CURRENT VOLUMES OF THE NUREG-1556 TECHNICAL REPORT SERIES ("CONSOLIDATED GUIDANCE ABOUT MATERIALS LICENSES") FOR DETAILED INSTRUCTIONS FOR COMPLETING THIS FORM: http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1556/. SEND TWO COPIES OF THE COMPLETED APPLICATION TO THE NRC OFFICE SPECIFIED BELOW.

APPLICATION FOR DISTRIBUTION OF EXEMPT PRODUCTS FILE APPLICATIONS WITH:

MATERIALS SAFETY LICENSING BRANCH
DIVISION OF MATERIAL SAFETY, STATE, TRIBAL AND RULEMAKING PROGRAMS
OFFICE OF NUCLEAR MATERIALS SAFETY AND SAFEGUARDS
U.S. NUCLEAR REGULATORY COMMISSION
WASHINGTON, DC 20555-0001

ALL OTHER PERSONS FILE APPLICATIONS AS FOLLOWS:

IF YOU ARE LOCATED IN:

ALABAMA, CONNECTICUT, DELAWARE, DISTRICT OF COLUMBIA, FLORIDA, GEORGIA, KENTUCKY, MAINE, MARYLAND, MASSACHUSETTS, NEW HAMPSHIRE, NEW JERSEY, NEW YORK, NORTH CAROLINA, PENNSYLVANIA, PUERTO RICO, RHODE ISLAND, SOUTH CAROLINA, TENNESSEE, VERMONT, VIRGINIA, VIRGIN ISLANDS, OR WEST VIRGINIA,

SEND APPLICATIONS TO:

LICENSING ASSISTANCE TEAM
DIVISION OF NUCLEAR MATERIALS SAFETY
U.S. NUCLEAR REGULATORY COMMISSION, REGION I
2100 RENAISSANCE BOULEVARD, SUITE 100
KING OF PRUSSIA, PA 19406-2713

IF YOU ARE LOCATED IN:

ILLINOIS, INDIANA, IOWA, MICHIGAN, MINNESOTA, MISSOURI, OHIO, OR WISCONSIN, SEND APPLICATIONS TO:

MATERIALS LICENSING BRANCH
U.S. NUCLEAR REGULATORY COMMISSION, REGION III
2443 WARRENVILLE ROAD, SUITE 210
LISLE, IL 60532-4352

IF YOU ARE LOCATED IN:

ALASKA, ARIZONA, ARKANSAS, CALIFORNIA, COLORADO, HAWAII, IDAHO, KANSAS, LOUISIANA, MISSISSIPPI, MONTANA, NEBRASKA, NEVADA, NEW MEXICO, NORTH DAKOTA, OKLAHOMA, OREGON, PACIFIC TRUST TERRITORIES, SOUTH DAKOTA, TEXAS, UTAH, WASHINGTON, OR WYOMING,

SEND APPLICATIONS TO:

NUCLEAR MATERIALS LICENSING BRANCH
U.S. NUCLEAR REGULATORY COMMISSION, REGION IV
1600 E. LAMAR BOULEVARD
ARLINGTON, TX 76011-4511

PERSONS LOCATED IN AGREEMENT STATES SEND APPLICATIONS TO THE U.S. NUCLEAR REGULATORY COMMISSION ONLY IF THEY WISH TO POSSESS AND USE LICENSED MATERIAL IN STATES SUBJECT TO U.S. NUCLEAR REGULATORY COMMISSION JURISDICTIONS.

1. THIS IS AN APPLICATION FOR *(Check appropriate item)*

- ☐ A. NEW LICENSE
- ☑ B. AMENDMENT TO LICENSE NUMBER: SUA-1471
- ☐ C. RENEWAL OF LICENSE NUMBER:

2. NAME AND MAILING ADDRESS OF APPLICANT *(Include zip code)*

Homestake Mining Company of California
P.O. Box 98
Grants, NM 82070

3. ADDRESS WHERE LICENSED MATERIALS WILL BE USED OR POSSESSED

Homestake Mining Company of California
560 Anaconda Road
Route 605
Milan, NM 87021

4. NAME OF PERSON TO BE CONTACTED ABOUT THIS APPLICATION

Brad Bingham

BUSINESS TELEPHONE NUMBER	BUSINESS CELLULAR TELEPHONE NUMBER
505.287.4456 x35	505.290.8019

BUSINESS E-MAIL ADDRESS
bbingham@homestakeminingcoca.com

SUBMIT ITEMS 5 THROUGH 11 ON 8-1/2 X 11" PAPER. THE TYPE AND SCOPE OF INFORMATION TO BE PROVIDED IS DESCRIBED IN THE LICENSE APPLICATION GUIDE.

5. RADIOACTIVE MATERIAL
   a. Element and mass number; b. chemical and/or physical form; and c. maximum amount which will be possessed at any one time.
6. PURPOSE(S) FOR WHICH LICENSED MATERIAL WILL BE USED.
7. INDIVIDUAL(S) RESPONSIBLE FOR RADIATION SAFETY PROGRAM AND THEIR TRAINING AND EXPERIENCE.
8. TRAINING FOR INDIVIDUALS WORKING IN OR FREQUENTING RESTRICTED AREAS.
9. FACILITIES AND EQUIPMENT.
10. RADIATION SAFETY PROGRAM.
11. WASTE MANAGEMENT.

12. LICENSE FEES (Fees required only for new applications, with few exceptions*)
(See 10 CFR 170 and Section 170.31)
***Amendments/Renewals that increase the scope of the existing license to a new or higher fee category will require a fee.**

FEE CATEGORY: | AMOUNT ENCLOSED $:

PER THE DEBT COLLECTION IMPROVEMENT ACT OF 1996 (PUBLIC LAW 104-134), YOU ARE REQUIRED TO PROVIDE YOUR TAXPAYER IDENTIFICATION NUMBER. PROVIDE THIS INFORMATION BY COMPLETING NRC FORM 531: https://www.nrc.gov/reading-rm/doc-collections/forms/nrc531info.html.

13. CERTIFICATION. *(Must be completed by applicant) THE APPLICANT UNDERSTANDS THAT ALL STATEMENTS AND REPRESENTATIONS MADE IN THIS APPLICATION ARE BINDING UPON THE APPLICANT.*

THE APPLICANT AND ANY OFFICIAL EXECUTING THIS CERTIFICATION ON BEHALF OF THE APPLICANT, NAMED IN ITEM 2, CERTIFY THAT THIS APPLICATION IS PREPARED IN CONFORMITY WITH TITLE 10, CODE OF FEDERAL REGULATIONS, PARTS 30, 32, 33, 34, 35, 36, 37, 39, AND 40, AND THAT ALL INFORMATION CONTAINED HEREIN IS TRUE AND CORRECT TO THE BEST OF THEIR KNOWLEDGE AND BELIEF.
WARNING: 18 U.S.C. SECTION 1001 ACT OF JUNE 25, 1948 62 STAT. 749 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

CERTIFYING OFFICER -- TYPED/PRINTED NAME AND TITLE	SIGNATURE	DATE
Brad Bingham Closure Manager	Brad Bingham	01/12/21

FOR NRC USE ONLY

TYPE OF FEE	FEE LOG	FEE CATEGORY	AMOUNT RECEIVED $	CHECK NUMBER	COMMENTS
APPROVED BY				DATE	