



Grants Reclamation Project

Homestake Mining Company of California

Thomas Wohlford
Closure Manager

September 20, 2018

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Re: Reply to “Request for Additional Information – NRC Review of Land Application Area Report and Final Status Survey, Docket No. 040-08903, License No. SUA-1471

Dear Sirs:

Homestake Mining Company of California (HMC) has prepared this response to a Request for Additional Information (RAI) by the Nuclear Regulatory Commission (NRC) (letter dated August 17, 2018) concerning “the Final Status Survey Report for the land application areas as required by Conditions 14 and 15 of the U.S. Nuclear Regulatory Commission (NRC) Confirmatory Order (EA-16-114)” (ML18205A460). NRC indicates that additional information is required from HMC regarding the status of piping and the center pivot irrigation equipment that was utilized in the land application program.

Should you have any questions or comments regarding the attached RAI responses, please contact me at twohlford@homestakeminingcooca.com or (505) 290-2187.

Sincerely,

Thomas P. Wohlford
Closure Manager
Homestake Mining Company, Grants, New Mexico

cc: J. Whited, NRC, Rockville, Maryland (electronic copy)
Regional Administrator, NRC, Region IV (hard copy)
M. McCarthy, Barrick, Toronto, Ontario (electronic copy)
C. Burton, Barrick, San Francisco, California (electronic copy)
G. George, Davis Wright Tremain, San Francisco, California (electronic copy)
R. Whicker, ERG, Albuquerque, New Mexico (electronic copy)
G. Hoffman, Hydro-Engineering, Casper, Wyoming (electronic copy)

NM5501



Preface

The following presents HMC responses to RAIs from NRC concerning “the Final Status Survey Report for the land application areas as required by Conditions 14 and 15 of the U.S. Nuclear Regulatory Commission (NRC) Confirmatory Order (EA-16-114)” (ML18205A460). Each RAI from NRC is shown in italics, followed by HMC’s response.

RAI #1

Please provide information regarding the disposition of the pipes associated with the Land Application Program. Specifically, verify where the pipes associated with the Land Application Program are currently stored.

HMC Response

The attached Figure 1 displays the location of existing piping and the former location of piping that has been removed from the general land application areas. For the purposes of discussion, the piping is distinguished as collection and conveyance piping, which is HDPE pipe in various sizes, and irrigation piping, which is a specialty thin-walled PVC pipe with sliding gates (commonly referred to as Gated Pipe) that is only used for surface irrigation. The distinction in the type of piping is made because nearly all of the HDPE pipe can be utilized in the continuing groundwater restoration program at the site and much of the HDPE pipe has already been removed and repurposed or converted to use in the restoration program. In contrast, HMC has no foreseeable future use for the PVC Gated irrigation pipe at the site.

The radiological surveys performed on the PVC irrigation pipe are described in the response to RAI #2. As the surveys of a representative sample of the PVC irrigation pipe described in the response to RAI #2 have indicated that the PVC irrigation pipe can be released for unrestricted use, no action is required from a radiological exposure standpoint. The bulk of the PVC irrigation pipe has been collected and stockpiled outside of the former irrigation areas (see Figure 1) where it won’t interfere with activities in the former irrigation areas. HMC plans to transport the stockpiled PVC irrigation pipe to a stockpile area within the controlled area. The remainder of the PVC irrigation pipe is believed to be located in the pipe storage area near the office facilities. Prior to or during final reclamation at the site, the PVC irrigation pipe will be disposed of in the designated disposal areas in the Small Tailings Pile (STP).

The disposition of the HDPE pipe is more involved than that of the PVC irrigation pipe because much of it has already been repurposed in the groundwater restoration program. In the North Off-Site area and the area of the former Section 28 (T12N, R10W) center pivot irrigation, available HDPE piping has been removed and repurposed, or it is currently in use or has been converted for use in the groundwater restoration (see Figure 1). This former irrigation supply piping includes buried pivot supply piping (see Figure 1) that has been converted to use in the groundwater restoration program.

The South Off-Site area, the former flood irrigation and the former Section 33 (T12N, R10W) center pivot and flood irrigation areas are located in roughly the southern half of Figure 1. The major HDPE conveyance pipeline for the former Section 33 center pivot irrigation area has been removed and reused and the former location is indicated with the red bounding line along the southern edge of Figure 1. There are some remaining HDPE pipelines to the west of the former Section 33 center pivot



irrigation area and also some sections of small diameter piping to the east of the former irrigation area (see blue bounding lines in southwestern quadrant of Figure 1). These pipes will be removed and are planned to be stored within the controlled area. The pipes may also be taken directly to other restoration areas for reuse. The pivot supply pipeline indicated by the green boundary on Figure 1 for the Section 33 Center Pivot is buried. This buried pipe is planned to be left in place because removal would require significant disturbance of the limited vegetation in the area. The pivot supply pipeline is accessible on the southern and northern ends and a representative section of this pipe will be radiologically surveyed using procedures similar to those described or referenced in the response to RAI #2. If the survey/scanning indicates the buried pipe can be released for unrestricted use, the exposed end(s) of the pipe will be excavated to the point where the minimum burial depth is 18 inches. The ends of the pipe will then be capped and then the excavation will be backfilled and graded. If the radiological survey/scanning results in exceedance of established action levels, HMC will develop a plan to evaluate and mitigate any radiological hazard. The plan may include actions such as an expanded radiological survey, evaluation of the potential hazard, and partial or complete removal of the pipe.

The HDPE pipelines associated with the groundwater restoration program for the South Off-Site area are routed through and near the former flood irrigation in Section 34 (T12N, R10W). This includes supply pipelines for the former irrigation area that have been converted or reconfigured for use in the restoration program. Additional conveyance pipelines for the groundwater restoration program have been installed in the former flood irrigation area after the irrigation was discontinued and these will be maintained and utilized through the end of the restoration program. There are some small stockpiles of used HDPE pipe staged in the former flood irrigation area and this pipe will be removed from the irrigation area for use in the general area for the groundwater restoration infrastructure. If there is no anticipated use for this stockpiled HDPE pipe in the South Off-Site restoration infrastructure, the pipe will be moved to stockpile areas within the controlled area or possibly relocated to other restoration areas for reuse. The PVC irrigation pipe located in the former flood irrigation area will be addressed as described previously in this response.

RAI #2

Please provide any details regarding any surveys of the pipes currently in place or following removal from the land application areas.

HMC Response

In 2014 Environmental Restoration Group, Inc. (ERG) personnel performed radiological surface contamination surveys on a representative sampling of polyvinyl chloride (PVC) pipeline material stored at the HMC Grants facility. This piping was previously used in the Land Application program. Consistent with Condition 14 of NRC License Number SUA-1471, the surveying was conducted in accordance with HMC procedures for the release of materials and equipment from the facility. The results of these surveys are documented in a report provided to HMC (ERG, 2014) as provided in Attachment 1.

The inventory of pipe material consisted of approximately one mile of pipeline of varying diameters, previously extended from wells in Sections 27, 28; and 33-35 to irrigation fields in Sections 28, 33, and 34. The subject piping was removed from the Land Application areas and staged south of the office/shop compound area. Twenty percent of the staged PVC pipes (44 pipes total) were randomly



surveyed by ERG personnel. Release criteria for unrestricted future use were consistent with those specified in NRC Regulatory Guide 8.30 (NRC, 2014) as follows:

- Gross alpha Scanning measurements $< 5,000$ dpm/100 cm²
- Removable alpha activity measurements $< 1,000$ dpm/100 cm².

An additional release criterion was gamma radiation levels $<$ twice established background. External gamma measurements, removable swipes on each opening, and 100% coverage scans of the interior of each pipe was conducted. The interior pipe scans were performed with a special remotely controlled robotic device developed to "crawl" along the inside of the pipe with 12 Geiger-Mueller (GM) detectors positioned about 1 cm above interior surfaces of the pipe.

Of all pipes scanned, none of the external gamma, removable alpha, or alpha scanning measurements exceeded the action limits. Given that all pipes conveyed the same groundwater, the random survey of 20% of the material is considered representative of the collection of PVC piping as a whole. Based on these survey results, the PVC piping material qualifies for release for unrestricted use consistent with Condition 14 of SUA-1471. Despite these release survey results, disposition of the surveyed PVC piping has not been decided, and this material remains stored at the HMC facility south of the office/shop compound area. Radiological contamination surveys have not been performed for other types of piping, namely those made of high-density polyethylene (HDPE) as this type of pipe material has generally been repurposed for continued use in groundwater restoration programs at the site.

REFERENCES

Environmental Restoration Group, Inc. (ERG). 2014. Disposition Survey Report for Piping Materials. Internal Technical Memorandum to the Closure Manager, December, 2017.

RAI #3

Please provide any details regarding any surveys of the soil around the pipes associated with the Land Application Program.

HMC Response

The objective of this RAI appears related to determination of whether any pipeline leaks or spills could have impacted discrete volumes of soil at specific locations to a greater extent than did diffuse application of irrigation water during the land application project. Specific and discrete volumes of soil that were once in direct physical contact with irrigation water conveyance pipelines during the land application process have not been conducted. However, because the groundwater used for irrigation contained only low levels of uranium and selenium, and respective levels were relatively consistent over time and were applied uniformly across the land application areas during the course of the irrigation project, localized impacts due to leaks/spills may not measurably exceed impacts associated with uniform irrigation (the latter would have involved much greater overall volumes of impacted groundwater released to soil over the course of the project).

The final status survey (FSS) conducted by HMC across each land application area (ERG, 2018) included gamma survey coverage on 10-meter transects, and both systematic and biased soil sampling



was conducted. It is expected that the FSS, combined with NRC's follow-up verification sampling, should be adequate to identify radiologically significant "hotspots" that could have occurred due to leaks or spills, particularly those large enough to have impacted areas larger than 100 m², which is the areal basis on which release criteria are to be evaluated (ERG, 2017) in accordance with 10 CFR 40, Appendix A, Criterion 6(6) and NRC guidance found in NUREG-1620.

REFERENCES

Environmental Restoration Group, Inc. (ERG). 2017. Final Status Survey Plan for Release of Former Land Application Areas, Grants Reclamation Project, Cibola County, New Mexico. Revision 1, November 13, 2017.

Environmental Restoration Group, Inc. (ERG). 2018. Final Status Survey Report for Release of Former Land Application Areas, Grants Reclamation Project, Cibola County, New Mexico. Revision 0, July 2, 2018.

RAI #4

The NRC staff additionally notes that, as can be observed in the pictures in the Memorandum, the center pivot irrigation equipment appears to still remain on the land application areas. The NRC cannot complete its review of Conditions 14 and 15 of the Confirmatory Order until this equipment, and all pipes associated with the Land Application Program, are removed. Please provide the details regarding the disposition of the center pivot irrigation equipment.

HMC Response

The attached Figure 1 displays the location of the former center pivot irrigation areas. The center pivot sprinkler systems are planned to be removed from the irrigation areas and transported off the field to a storage area adjacent to the fields as described below or to a storage area within the controlled area. HMC is currently evaluating alternatives for disassembly and transport of the center pivot systems to allow removal in a timely manner.

A common technique for removal and short distance transport of center pivot sprinklers is to simply disconnect the overhead piping and other hydraulic or electrical lines at each tower which effectively disassembles the sprinkler into a number of major components equal to the number of towers in the system plus the central pivot tower. This limited disassembly exposes the interior of each sprinkler pipe span at each end to allow for a radiological survey of the pipe interior as well as the exterior of the sprinkler system. The limited disassembly also allows an entire span and tower system to be towed or transported short distances as a single unit.

After the partial disassembly and while the major components of the sprinkler system are still in the field, a radiological survey will be performed to determine if all or part of the sprinkler system can be released for unrestricted use. The survey may be done as a limited screening approach or as a comprehensive survey depending on the preliminary results of the scanning. If the survey indicates the major structural components (e.g. pipe spans, bracing, tower assemblies etc.) can be released for unrestricted use, the individual tower and span units will be removed from the field and towed/transported to a convenient location to allow for salvage, further disassembly, transfer/sale to



other parties or other beneficial use. This location may be adjacent to the former irrigation areas. There may be minor system components (e.g. sprinkler nozzles, connector hoses etc.) that do not meet the established action levels for release, and any such components that cannot be released for unrestricted use will be removed from the sprinkler and transported for storage or disposal within the controlled area. The comprehensive radiological survey will include all center pivot sprinkler components (including the center tower and feed pipe) to insure that all sprinkler equipment remaining outside of the controlled area can be released for unrestricted use.

If the radiological survey indicates the major structural components (e.g. pipe spans, bracing, tower assemblies etc.) cannot be released for unrestricted use, the system may be towed directly to a storage area within the controlled area, disassembled/demolished in place and transported to within the controlled area, or it may be moved to a nearby staging area for further disassembly or demolition before transfer to storage or disposal within the controlled area.

The tower and pivot feed pipe at the pivot location will be removed and radiologically surveyed as a part of the sprinkler system. The concrete foundation and any associated anchorage will be demolished and transported for storage or disposal within the controlled area. As described previously in the response to RAI #1, the buried supply pipeline that is not currently in use for the restoration program will be radiologically surveyed and capped and covered if no established action levels are exceeded.