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Written Comment of the Pueblo of Acoma
Before the
National Remedy Review Board

Meeting on
Homestake Mining Company Superfund Site – Technical Impracticability Waiver Request

March 25, 2021

The Pueblo of Acoma ("Pueblo" or "Acoma") is pleased to provide these written comments for the record of the National Remedy Review Board for its meeting on the Homestake Mining Company Superfund Site – Technical Impracticability Waiver on March 25, 2021.

Acoma remains deeply concerned about the continued impact of contamination from the Homestake Mining Company on the Pueblo of Acoma, our people, and our water. A complete Technical Impracticability ("TI") Waiver is inappropriate. Remediation of the primary source contaminants and the groundwater must be required. Removal of contamination close to the tailings will reduce the long-term impact to the basin, even if the farthest reaches of the contaminants plume cannot be removed for centuries. At a minimum, any TI Waiver must provide for maintenance of the hydraulic barrier. If not, what will prevent contamination of the SAGA?

Acoma supports the selection of alternatives that will continue to remediate available groundwater. The agency's Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration, United States Environmental Protection Agency at page 19 (Sep. 1993) makes it clear that cost should not automatically determine technical impracticability ("relatively high restoration costs may be appropriate in certain cases, depending on the nature of the contamination problem and considerations such as the current and likely future use of ground water."). Meeting the United States' trust responsibility to replace a water supply for tribal nations is a paramount future use that must be given appropriately great weight.

Acoma urges the National Remedy Review Board to consider these comments in its determination.

I. Acoma Background & History in the Rio San Jose Basin

The Pueblo of Acoma is one of, if not, the longest continually inhabited community in the United States. Prior to the arrival of the Spaniards in the first half of the 16th Century, the Pueblo of

Acoma had long been in existence. The Acoma Culture Province encompasses most, if not all, of the Rio San Jose Basin.[1] The people of Acoma cultivated lands, raised crops, developed irrigation systems, maintained livestock and generally used the waters of the Rio San Jose and its tributaries long before the arrival of European settlers. Thus, from "time immemorial," the Acoma people cared for the land and used its water, and continue to do so, for their livelihood.

Acoma lies within the Rio San Jose Basin. Today the Rio San Jose Basin includes the surface flows and groundwater of the Rio San Jose, and the Bluewater Groundwater Basin.[2] In a natural state, the Rio San Jose gains flows from groundwater at certain places and loses flow to the underlying aquifers in different places. Acoma has historically relied on surface and alluvial ground water in the Basin. Wells tapping alluvial groundwater were mentioned in reports of Coronado's first visit to Acoma in the 1540s. Two of the most important sources of water for the Pueblo of Acoma as of 1848 were (1) the Ojo Del Gallo spring[3] and (2) Bluewater Creek, a major tributary of the Rio San Jose that collects water from the Zuni Mountains. About two-thirds or more of the original, pre-European contact supply for the Pueblos was derived from these two sources.[4] Springs, summer rain and melting Mount Taylor snowpack provide the remaining water supply to Acoma.

II. San Andres-Glorieta Aquifer

The San Andres-Glorieta aquifer is an important aquifer in the Rio San Jose Basin. It reaches the surface at the Ojo Del Gallo spring located near the community of San Rafael and in certain reaches of Bluewater Creek. [5] It also contributes to the alluvial aquifer of the Rio San Jose just north of the Ojo Del Gallo and west of Horace Springs on the western boundary of Acoma's federally recognized land grant.

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[1] Ruppé, Reynold J. (Jr.) "The Acoma Culture Province: An Archaeological Concept (1990), Page8, Figure 2. Dr. Ruppé

[2] In 1956, the State Engineer of New Mexico declared the Bluewater Underground Basin which underlies the western Rio San Jose Basin. Thus, references to groundwater in the Bluewater Basin refer to groundwater within the larger Rio San Jose Basin.

[3] *See* William D. White, Hydrological and Environmental Indicators of a Dewatered Wetland: Ojo Del Gallo, San Rafael, New Mexico, 1989, 337-338. ("A fault-controlled spring, the Ojo Del Gallo, issues from the Permian San Andres Limestone on the eastern toe of the Zuni Mountains, immediately north of the village of San Rafael, New Mexico. The spring is a surface expression of the groundwater flow system that now provides the water supply for the upstream communities of Bluewater, Milan and Grants, and supported the uranium industry during its heyday.")

[4] *Id*. The United States Geological Survey has estimated the unimpeded natural flow in the Rio San Jose to be 12,000 to 14,000 ACRE-FEET PER YEAR at the western boundary of the Pueblo of Acoma. These annual natural flows were made up of about 5,000 ACRE-FEET PER YEAR of overland stream flow, primarily from Bluewater Creek; 3,000 to 5,000 ACRE-FEET PER YEAR of steady spring flow from Ojo Del Gallo; 3,600 ACRE-FEET PER YEAR from Horace Spring, etc. The State of New Mexico has estimated it to be up to 17,000 ACRE-FEET PER YEAR. Additional springs on Acoma lands east of the western boundary increase the unimpeded natural flow through Acoma towards Laguna Pueblo. Thereafter additional springs on Laguna Pueblo and on non-Pueblo lands contribute to surface flows across Laguna (citing Risser, Dennis W., Natural Streamflow in the Rio San Jose Upstream from the Pueblos of Acoma and Laguna, New Mexico, USGS, Water Resources Investigation, No. 82-4096, 1982 and Petronis, Laura, Estimated Natural Streamflow at the Western Boundary of the Acoma Pueblo and Western Boundary and Northern Areas of the Laguna Pueblo in the Rio San Jose Basin, New Mexico (2008)).

[5] Affidavit of William P. Balleau, Hydrologist, Branch of Rights Protections, Albuquerque Area Office of the BIA, March 13, 1985.

Studies demonstrate that the groundwater and surface water systems in this basin are interrelated and that the effects of changes in groundwater pumping or surface diversions can be seen throughout the basin. Due to the high transmissivity of the San Andres-Glorieta aquifer, the flow of water at Ojo Del Gallo and Bluewater Creek is very sensitive to groundwater pumping in the Basin.[6]

The conclusion that groundwater pumping in the 20th century caused Ojo Del Gallo to go dry is widely accepted by regional hydrologists.[7] As a result of agricultural development in the 1930's and 1940's, and the uranium industry in the 1950's - 1970's, the spring's discharge declined from a virgin flow condition of approximately 7 cubic feet per second to zero discharge in 1953. "Ground water development, originally for agricultural purposes followed by the uranium industry, reduced the pressure head on the San Andres Limestone to a point below the ground surface elevation of Ojo Del Gallo by the year 1953."[8] After the collapse of the uranium mining industry, the spring returned briefly in the early 1980's only to go dry again once industrial uses increased, including attempts to remediate contamination of land and water by the uranium mining and milling companies.

A subcrop of the alluvium overlies the San Andres-Glorieta aquifer limestone near the Homestake Site.[9] Despite the Chinle Shale underlying the alluvium at the Homestake site, to the west of the Homestake Site shallower portions of the San Andres-Glorieta aquifer with a much thinner section of the Chinle Formation establish that a "… good connection between the alluvial and San Andres aquifers may exist even when a few tens of feet of Chinle Formation exist."[10]

III. Uranium Mining & Homestake-Barrick Mine

The uranium mining and milling industry in areas upstream from the Pueblo of Acoma, further diminished Acoma's water supply for the following reasons. (1) Uranium mining required substantial groundwater use, depleting groundwater that would have supplied springs on and around Mount Taylor and tributary runoff that supplemented the Rio San Jose surface flows and which fed tributaries to the Rio San Jose; (2) the cleanup of contamination from uranium mines

[6] Affidavit of William P. Balleau, hydrologist at the Branch of Rights Protections, Albuquerque Area Office of the BIA, March 13, 1985. ("The San Andres-Glorieta aquifer in its natural equilibrium state was recharged by surface streams by approximately 5,000 ACRE-FEET PER YEAR near the mouth of Bluewater Creek and approximately 5,000 ACRE-FEET PER YEAR were correspondingly discharged at Ojo Del Gallo. High rates of groundwater pumping in the 1940's through 1970's cause the groundwater levels in the aquifer to decrease and cause Ojo Del Gallo to cease flowing. That intensive pumping also decreased natural discharge from the aquifer into Bluewater creek and induced additional recharge to the aquifer from Bluewater Creek, thus causing reduced surface flow in the Rio San Jose and largely preventing Bluewater Creek surface water from reaching the western boundary of the Pueblo of Acoma.")

[7] William P. Balleau, Bluewater Basin Withdrawals and Sources of Water, Bureau of Indian Affairs, Albuquerque Area Office, Branch of Rights Protection, March 1984, 1-4.

[8] *See* William D. White, Hydrological and Environmental Indicators of a Dewatered Wetland: Ojo Del Gallo, San Rafael, New Mexico, 1989, 337-338.

[9] *See* Draft Technical Impracticability Evaluation, Homestake Mining Company Superfund Site Operable Unit #1 – Groundwater Remediation, Cibola County, New Mexico (Nov. 2020) (Figures 2-16 and 2-17); *See also, Id.* at Figure 7-6 (Vertical extent of TI Zone_Cross Section D-D).

[10] Homestake Mining Company of California, Ground-Water Hydrology, Restoration and Monitoring at the Grants Reclamation Project for NMED Offsite DP (Feb. 2010), 6-1.

and mills to this day requires substantial groundwater use; and (3) population growth, settlement and the agricultural and real estate development associated with the growth of the uranium industry in the Grants/Acoma region led to substantial groundwater use. Thus, for a number of decades, withdrawals from the Basin for these uses have far exceeded the recharge to the groundwater aquifers, effectively creating the situation where the aquifers are being mined for water.[11]

Uranium mining and milling in New Mexico impacted all constituents of the environment, including soils stream sediments, surface water and groundwater.[12] There were at least four mills for creating yellowcake near Grants in the Rio San Jose Basin: Bluewater Disposal, now known as the ARCO site northwest of Grants, Rio Algom (formerly Kerr-McGee and Quivera) and Phillips-United Nuclear Corporation in the Ambrosia Lake area and Homestake- Barrick, the subject of these comments, a short distance north of Grants and located on a major tributary of the Rio San Jose, San Mateo Creek. Decades of collective uranium milling activity in the Grants/Acoma area caused region-wide groundwater contamination in alluvial and other shallow aquifers.[13] Cleanup of contamination has used, and continues to use, extensive water resources, with significant depletion of water resources.

Homestake-Barrick Mining Company ("HMC"), licensed by the Atomic Energy Commission, operated two uranium mills from approximately 1958-1990. During operations, approximately 22 million tons of ore were milled at the site, using a conventional alkaline leach process.[14] This milling activity caused widespread groundwater use and contamination contained in alluvial and nearby aquifers. The mill site was declared a Superfund Site by the U.S. Environmental Protection Agency ("EPA") and has been in reclamation since 1990, following the demolition of the mill.

Cleanup of the Homestake site continues to use extensive water resources and has not been wholly successful.[15] "The contaminant plume has receded back almost three-quarters of a mile into the site boundaries of HMC by injecting fresh water down gradient of the site. Nearly 4.5 billion gallons of contaminated water have been removed and 540 million gallons of treated

[11] While "mining" of groundwater in aquifers that are not associated with alluvial and surface flows, and therefore have minimal recharge, may be acceptable, where there is an on-going hydrologic relationship between surface flows and groundwater is not acceptable as it ultimately destroys the surface flows that others rely on. See, Mathers *v. Texaco, Inc*., 421 P.2d 771 (N.M. 1966).

[12] *See*, Dixon, Earle Campbell, "The Legacy Uranium Mining and Milling Cleanup Plan: Evaluation of the EPA Five Year Plan, Grants Mining District, New Mexico" (July 2015).

[13] The discovery of large subsurface uranium deposits within the Jurassic Wastewater Canyon Member of the Morrison Formation at Ambrosia Lake resulted in the establishment of two-thirds of the active uranium mines in New Mexico within the Ambrosia Lake Mining Sub-District by 1980. *See* U.S. Environmental Protection Agency, Administrative Settlement Agreement and Order on Consent for the San Mateo Creek Basin Legacy Mines Sites, Dec. 3, 2019. Ambrosia Lake is in the northwestern portion of the Rio San Jose Basin and the adjoining San Juan Basin.

[14] EPA Third Five-Year Review Report, Homestake Mining Company Superfund Site, (EPA ID: NMD007860935) Cibola County, New Mexico

[15] *See generally*, Pueblo of Acoma Protest to Applications by Homestake Mining Company to Change Well Location No. B-28-S-323 and to Drill Supplemental Wells in the Bluewater Underground Water Basin No. B-28-S-386 through B-28-S-429.

water have injected into the aquifer."[16] Acoma has submitted multiple protests to HMC's applications to drill supplemental wells in the Bluewater Underground Water Basin, on the grounds that there is insufficient unappropriated water available to satisfy Homestake's request, yet the applications were approved.[17] The United States did nothing.

In 2012, the Office of the State Engineer approved HMC's application to temporarily divert 4,500 acre-feet per year and drill 839 supplemental wells.[18] This temporary permitted use is in addition to applying the 1,200-acre feet per year water right claimed by Homestake for reclamation activities. Despite Acoma's protests, the Office of the New Mexico State Engineer approved the installation of nearly 600 wells as of 2016 for the reclamation project, further draining the region's water supply.[19] According to EPA reports, 5,855,488,029 gallons of water, or 48,658.72 acre feet of water were pumped from the alluvial aquifer from 1978-2014.[20] The amount pumped from the San Andres Glorieta aquifer in the same period is likely to be more as the remediation effort pumped water from the San Andres Aquifer and then injected it into the alluvial aquifer. According to reports, water levels in three wells in the San Andres Glorieta aquifer under Acoma, where the aquifer is 2,000 feet below the surface have decreased by 46 feet since 1998.[21] The decline in the San Andres Glorieta aquifer west of the San Rafael fault where it is near or in contact with the alluvial aquifer is likely much greater.

Declines in the west San Andres Glorieta aquifer are of great concern to Acoma as 80% of the surface flows in the Rio San Jose as it traverses Acoma emanate from Horace Springs now come from the west SAGA. The flow at Horace Springs has diminished to a low of 1.8 cubic feet per second in dry periods.

Compounding this decline in water is the contamination in the Bluewater Basin. Small communities located near the Homestake Mill Site have had to discontinue use of their wells due to high levels of contamination. Contamination plumes from both the Homestake Mill Site and Bluewater Disposal, now known as the ARCO site, are moving towards Grants. Absent significant water pumping to keep those plumes from moving, they will contaminate surface and groundwater just upstream from Acoma in the not-too-distant future.

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[16] May 9, 2019, Homestake Mining Co., Superfund Site Profile, Superfund Site Information

[17] Pueblo of Acoma Protest to Applications by Homestake Mining Company to Change Well Location No. B-28-S-323 and to Drill Supplemental Wells in the Bluewater Underground Water Basin No. B-28-S-386 through B-28-S-429. ("Groundwater cannot be treated exactly like surface water because once appropriations exceed the natural recharge in an aquifer, it is being mined. It cannot be treated as a reoccurring resource. Based on the drop in flow from Ojo Del Gallo at San Rafael, which is historically related to depletion of the San Andres-Glorieta aquifer, this aquifer is already being mined to meet present uses, threatening senior water users. Supplementing Homestake's use will result in a greater possibility that water will be insufficient to meet the needs of the holders of senior water rights.")

[18] *See* Feb. 6, 2012 letter from NM Office of the State Engineer. A temporary diversion request of 4,500 was approved in Feb. 2008.

[19] U.S. Environmental Protection Agency, Fourth Five-Year Review Report for Homestake Mining Company Superfund Site, September 2016.

[20] *Id.* Appendix G-2.

[21] Kathy Helms, "Official: Dilution Helps Reduce Uranium Mill Contamination", *Gallup Independent*, May 5-6, 2018.

IV. Acoma Concern: Spread of Contamination

Acoma has grave concerns regarding the potential for the spread of contamination from polluted aquifers to the San Andres-Glorieta aquifer, a primary domestic water source for the region; a complete TI Waiver is inappropriate. Remediation of the primary source contaminants and the groundwater must be required.

The restoration of contaminated ground waters is a primary objective of the Superfund and Resource Conservation and Recovery Act ("RCRA") Corrective Action programs.[22] Remedial alternatives must: 1) be protective of human health and the environment; and 2) "the remedy must meet (or provide the basis for waiving) [applicable or relevant and appropriate requirements] for the action."[23]

The primary focus must be on the "engineering perspective" of the technical feasibility to achieve cleanup. The cost should not be a major factor, unless inordinately costly.[24] Guidance further states that cost, "is subordinate to that of ensuring protectiveness [,]" and the determination of inordinate cost, "must be determined based on the particular circumstances of the site." Further, "relatively high restoration costs may be appropriate in certain cases, depending on the nature of the contamination problem and considerations such as the **current and likely future use of ground water**."[25]

In addition, the restorative timeframe is a subordinate factor in a requested TI waiver. There is no single timeframe in which restoration must be achieved to be considered technically practicable. While very long timeframes may be indicative of remedial constraints, the EPA must establish "TI decisions on an overall demonstration of the extent of such physical constraints at a site, not on restoration timeframe analyses alone."[26]

First, Homestake's requested TI Waiver Evaluation makes conclusions about the impracticability of remediation of the primary source of contaminations (the tailings piles and secondary sources) and the remediation of contaminated groundwater. The TI Waiver Evaluation lists several reasons to justify the impracticability of remediation of the primary and secondary source contaminants.[27] The reasons include: 1) Cost Prohibitive; 2) Additional Risk to Human Health; 3) Potential Ecological Damage; 4) Potential Damage to Cultural Resources; 5) Potential Impacts from Increased Traffic; 6) Potential Regulatory Challenges; 7) Carbon Footprints; and 9) Potential Impacts to Community.[28]

Acoma takes the position that Homestake has not sufficiently demonstrated that remediation of the primary source and secondary sources are technically infeasible from an engineering perspective. Instead, the primary reasons described are primarily policy considerations. As an

[22] Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration, United States Environmental Protection Agency (Sep. 1993).
[23] *Id.* at 9
[24] *Id.* at 10 (citing the National Contingency Plan preamble).
[25] *Id.* at 19 (emphasis added)
[26] *Id.* at 16.
[27] Draft Technical Impracticability Evaluation, at 45.
[28] *Id.* at ES-4

example, it is inconceivable that "potential regulatory challenges" described as "siting studies, public hearings, and environmental reports […]" should be an impediment towards the engineering feasibility to remove the primary and secondary sources. Further, federal processes to consider the potential impacts and alternatives towards any federal undertaking exist to address purported impracticability reasons to the environment, human health, and cultural resources. This is the primary reason for federal statutes and reviews under the National Environmental Policy Act and the National Historic Preservation Act and should not be considered as a factor of infeasibility.

While costly, Homestake has not demonstrated that the estimated costs ranges from $1.8 billion to $2 billion are inordinately costly or have such an unusual magnitude to be excessive for this type of removal. This should **not** be a primary factor in considering the engineering feasibility of its removal. So long as the primary and secondary sources remain present, there is a continued threat for further contamination and its removal should be required. Because of the continued impact, which the primary and secondary sources may have to ground water, "high restoration costs may be appropriate in certain cases, depending on the nature of the contamination problem and considerations such as the current and likely future use of the ground water."[29] The sheer magnitude of millions of tons of contaminants justifies the cost here, and should not be considered inordinate. Further, **all** water in the Bluewater basin must be considered as likely to be used in the future due to the continued water shortages faced by communities within the Basin.

The Homestake TI Waiver Evaluation makes conclusions about the technical impracticability of remediation of the groundwater. A primary reason for all five remedial alternatives is because of data demonstrating water remediation "would have to occur for centuries (Uranium = 210 years; and Molybdenum = 360 years) making groundwater restoration impracticable based on required excessively long duration for remediation."[30] This is primarily the case for the down gradient contamination plume. However, Alternatives GW3 through GW5 "are considered effective technologies for providing long-term effectiveness and permanence at addressing groundwater contaminated with [Contaminants of Primary Concern/and Radionuclides of Potential Concern,]"[31] and can be achieved in comparably shorter amounts of time, ranging between a few decades among the alternatives.

Remediation of ground water should be achieved wherever possible. According to the Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration, a primary goal of protectiveness should consider that:

> Potentially drinkable water would be cleaned up to levels safe for drinking throughout the contaminated plume, regardless of whether the water was in fact being consumed…[.] Alternative levels protective of the environment and safe for

[29] Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration, at 19.
[30] *Id.* at ES-5
[31] *Id.* at 66.

> other uses could be established for ground water that is not an actual or reasonably expected source of drinking water.[32]

Remediation should not be considered an all or nothing approach. The restoration of water is a primary remediation goal regardless of whether the water is reasonably expected to be used or not. The challenge of total remediation should not be used to discount alternatives that result in achievable remediation for only parts of the contaminated groundwater. A requested TI waiver can be narrow in scope and not preclude restoration of some of the contaminants present in the groundwater.[33] Therefore Acoma supports the selection of alternatives that will continue to remediate available groundwater.

V. Acoma Concern: Depletion of the San Andres-Glorieta aquifer

Acoma remains concerned about the continued depletion of the San Andres-Glorieta aquifer, which has historically and is presently being mined to meet present uses. As a senior water user in the Basin, the continued depletion of the San Andres-Glorieta aquifer is a grave threat to Acoma, as depletions have caused and will continue to cause damage to the water supply that the Pueblo has relied on for a millennia, and must rely on into the future for future generations.

As discussed earlier, in 2009 Acoma protested Homestake's *Applications to Change Well Location and Drill Supplemental Wells in the Bluewater Underground Water Basin,* due to the Pueblo's concern about the insufficient availability of San Andres-Glorieta aquifer water and the potential for contamination of the primary freshwater source in the region. While Acoma can appreciate the need for the increased pumping for remediation purposes, Acoma cannot idly stand by without raising concerns about the continued depletion of an increasingly limited water supply. The reality is the alluvial and Chinle formation groundwater will face several decades, if not centuries, of potential contamination, but will sacrifice the limited availability of San Andres-Glorieta aquifer water to improve the condition of the alluvial aquifer. The depletion of the San Andres-Glorieta aquifer is inextricably tied to the uranium industry's decades of pumping, and Homestake remains to be a major water pumper in the aquifer.

If the United States does agree to grant even a limited waiver of Homestake's clean up responsibilities prior to the expected transfer of site to the Department of Energy Legacy Management, as was done for ARCO/Bluewater mill site, and is in process for the Ambrosia Lake/Rio Algom site, then United States should acquire not only the perpetual liability, but also the water rights assets of Homestake so they might fulfill the nation's trust responsibility to protect the Pueblos' senior right to water flowing to Horace Springs. Therefore, an agreement should be entered into, or a condition should be placed upon the transfer of title of the Homestake site to the Department of Energy that would transfer Homestake's water rights to the United States.

[32] Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration, at 1 (citing the Preamble to the Proposed Subpart S to 40 CFR 254.)

[33] *See generally*, Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration, at 12 (Section 4.4.1 Specific ARARs or Media Cleanup Standards and Section 4.4.2 Spatial Extent of TI Decisions).

VI. Conclusion

At the end of this century, archaeologists will have estimated the Acoma people will have lived atop Acoma and in this region for over a thousand years. While the end of this century may seem far off, that will be within the lifetimes of current Acoma children and grandchildren. Based upon the estimated times for remediation to occur, the impacts of contaminants from the Homestake mine will still be felt, and of continued concern for them. Acoma strongly urges the board to consider this in making its determination. And to require the remediation of the primary source contaminants and the groundwater and continued maintenance of the hydraulic barrier.