NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau

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September 4, 2009

mk025RH

John De Joia, Manager
Roca Honda Resources, LLC
In Care of Strathmore Minerals Corp.
4001 Office Court Dr, Suite 102
Santa Fe, NM 87507

RE: Request for Additional Information, Roca Honda Mine, Discharge Permit Application, DP-1717

Dear Mr. De Joia:

The Ground Water Quality Bureau (GWQB) of the New Mexico Environment Department (NMED) received the discharge permit application for the Roca Honda Mine, submitted by Roca Honda Resources, LLC (RHR) on January 13, 2009. NMED is currently undergoing review of the application for technical completeness and requests additional information pursuant to Section 20.6.2.3109 NMAC of the Water Quality Control Commission (WQCC) Regulations. This letter requests information in addition to that contained within the discharge permit application, including the proposed sampling and analysis plan (SAP).

The SAP submitted to NMED as part of the discharge permit application begins with a section titled "Ground Water Data Gaps" but fails to include preceding sections that establish the existing information available, including a description of regional and local geology and hydrogeology. This information was submitted to the New Mexico Mining and Minerals Division (MMD) and is included in Sections 7 and 9 of the SAP provided to MMD in April, 2009 (MMD SAP). In addition, important information that is necessary for evaluation of the discharge permit application pursuant to 20.6.2 NMAC has been included in Section 8 of the MMD SAP. In the interest of streamlining the permit review process NMED will provide comments on the pertinent sections of the MMD SAP in this request for additional information, in addition to commenting on the materials submitted directly to NMED. RHR must submit Sections 7, 8 and 9 of the MMD SAP to NMED such that they are included in the administrative record for DP-1717. The submittal must include revisions that address the comments and questions below.

General Comments

In addition to the aforementioned requirement to submit materials pertaining to Sections 7, 8, and 9 of the MMD SAP, additional information needs to be provided that addresses the requirements of the New Mexico Water Quality Control Commission Regulations, 20.6.2 NMAC. Section 20.6.2.3109.C of the WQCC Regulations requires a demonstration that discharges will not result in a hazard to public health, as defined in Section 20.6.2.7.AA NMAC. This includes, at a minimum, the discharges associated with the proposed mine facilities on the surface in Sections 10 and 16 of T13N, R08W, the underground workings associated with the mineralized ore zones and aquifers to be impacted directly and indirectly by dewatering, and the alluvial systems and subcrop aquifers that have the potential to be impacted as a result of the discharge of treated water from dewatering. Specifically included are the San Mateo Creek alluvial system and aquifers that may be recharged from the San Mateo Creek alluvial system, the Westwater Canyon Member, and water bearing units located in the subsurface beneath and down gradient of the proposed surface facilities.

As such, RHR will be required to develop a monitoring plan that provides a mechanism for measuring the potential impacts from mining, processing and discharge from the proposed mine and mine facilities. RHR must also conduct sampling and analysis, and subsequent modeling to demonstrate that dewatering, subsequent discharge from the proposed mine facilities, and recharge of dewatered water bearing formations will not adversely impact water quality. This includes at a minimum, water quality sampling, sediment sampling, and the acquisition of pump test data. As mentioned in prior correspondence, the discharge of pump test water must be done pursuant to approval from NMED.

RHR has made significant efforts to collect historical water quality data, as well as identify potential places where existing water quality data can be obtained. NMED recognizes the time, effort, and expense put forth by RHR in this respect. It should be noted that the standards of Section 20.6.2.3103 apply unless a statistically significant demonstration is made that background concentrations are higher. This applies to all aquifers that may be impacted by the proposed mining operation and subsequent discharges. The demonstration may require different background standards be established for non-mineralized areas, and mineralized portions of the Westwater Canyon Member aquifer including oxidized and reduced zones, and all aquifers located stratigraphically above the Westwater Canyon Member.

The following are specific comments on both the discharge permit application submitted to NMED (DP Application) and the SAP submitted to MMD (MMD SAP).

Section A, DP Application

1. Sections A-5 and A-12 list Susan Evans as the permit contact. It is NMED's understanding that Ms. Evans no longer works for RHR. Please provide a current permit contact and appropriate contact information.

2. Section A-11 lists the total dissolved solids concentration (TDS) for the Gallup Sandstone as this formation contains the first water beneath the proposed facilities in Section 16.

RHR must also provide existing water quality for water bearing strata that subcrops beneath San Mateo Creek alluvium for the extent of expected alluvial saturation, all water bearing strata above the Westwater Canyon Member, and for the first water bearing unit beneath proposed Section 10 facilities.

Section B, DP Application

3. NMED has the following initial comments on the preliminary design components provided in Section B-5, B-6 and B-7, attachments B-1, B-2, B-3 and B-4. Given the duplicative numbering system of these sections and overlapping information, NMED will provide comments in a general format without referring to individual pages/sections. NMED will need to review detailed designs as they are developed and will likely have additional comments. RHR is advised to meet with NMED at various times during the design process to insure that the final design is acceptable for various components.
   a) Design drawings should be provided at a size and scale such that text and individual components can be clearly read and identified
   b) Final design drawings must include a registered New Mexico PE stamp.
   c) NMED will require that the concrete pad used for ore storage be sealed.
   d) Final sizing criteria and design of the septic system is required.
   e) It is unclear where water from the truck wash area is discharged.
   f) It is unclear where the solids slurry from the centrifuge is discharged.
   g) Ultra-filtration solids will be "trucked off-site to a mill". NMED will require notification as to the final destination of ultra-filtration solids.
   h) In the mine water discharge operational plan it is indicated that the uranium concentrations will be monitored and that if standards are not exceeded IX selection will be bypassed. It is unclear how or where this will be monitored to insure that standards are met at all times, nor is it indicated how other contaminants of concern will be monitored to insure standards are met prior to discharge. The same is true for the reverse osmosis system operation.
   i) It is indicated that the storm water basins are designed for a 100-year 24-hour event. RHR must submit those calculations for review.
   j) It is unclear if the storm water catchment basins are lined or unlined. Future drawings should be clear enough and at a scale large enough to determine what areas discharge to each stormwater catchment basin.

4. The "Not Applicable" box in Section B-10 regarding water rights is checked. NMED will require documentation of appropriate water rights for dewatering of the proposed mine.

5. Section B-11 discusses the recent monitoring of the Westwater Canyon Member and states that this represents background or existing water quality (Gross Alpha and Radium exceed standards). It should be noted that the standards established in Section 20.6.2.3103 of the WQCC Regulations apply unless a statistically significant demonstration is made that the background concentrations are higher. This applies to all aquifers that may be impacted by the proposed mining operation and discharge.

6. Sections B-12, B-13, and B-14 reference the Monitoring Plan to include sampling points for water treatment, metering of flow, and a ground water monitoring plan. It is indicated this will be submitted as design proceeds. The ground water monitoring plan should include, at a minimum, monitoring of first ground water beneath Section 16 and Section 10 facilities, monitoring to evaluate potential impacts to aquifers (including the Westwater Canyon Member) as a result of mining and dewatering, monitoring of the alluvial water in San Mateo Creek downgradient of the point where the treatment plant discharge enters the creek, and monitoring of aquifers that subcrop beneath the San Mateo Creek Alluvium. NMED recommends a meeting with NMED to review a draft of a proposed monitoring plan prior to submittal.

7. Section B-14 indicates that well logs for the existing three Westwater Canyon wells are attached. Included in Attachment A are geophysical logs for two of the referenced wells. NMED requires that well completion diagrams be submitted for all three wells that show the screened intervals within these wells. Please note that wells completed as ground water monitoring wells during long term operation of the site must be completed in accordance with the NMED Monitoring Well Construction and Abandonment Guidelines (attached).

8. Sections B-16 and B-18 reference contingency plans to be submitted. This must include development and submittal for approval, an Emergency Response Plan that describes both the normal operational plan for management of storm water and mine water as well as contingencies to address potential failures of the water management and treatment systems.

9. Section B-19 states, "The mine site will be reclaimed in accordance with NMMA requirements. In accordance with the act, a closure reclamation plan will be submitted to NMMMD which will incorporate NMED closure requirements." Section 20.6.2.3107(11) NMAC of the WQCC Regulations require that a closure plan be included as part of a discharge plan prior to permit approval. The closure plan must meet the requirements of the WQCC Regulations and insure protection of water quality. Adequate financial assurance must be provided for the costs of reclamation and long term ground water monitoring.

Sampling and Analysis Plan, Attachment B-6, DP Application

10. As mentioned above under the general comments, NMED requires submittal of Sections 7, 8 and 9 of the MMD SAP with revisions as necessary to address the comments included herein.

11. Comments on Table 9-1, Data Gaps:

    a) Item 2 indicates that water quality data collected from three wells installed in 2007 will be used for determining baseline ground water chemistry in the Westwater Canyon Member. As stated above in Comment 5, the standards established in Section 20.6.2.3103 of the WQCC Regulations apply unless a

statistically significant demonstration is made that the background concentrations are higher. This applies to all aquifers that may be impacted by the proposed mining operation and discharge.

b) Item 3 discusses using existing San Mateo area wells for further establishment of existing ground water conditions. NMED should be involved in determining which wells can provide appropriate data and whether additional wells need to be installed. These wells can be used as part of the demonstration discussed in Comment 5 above.

c) Item 4 discusses completion of a group of wells in Section 15 and a subsequent aquifer test to establish inter-aquifer connectivity. This is an area apparently devoid of faults and it is unclear if there are old exploration boreholes present. NMED is concerned whether this test will accurately describe the inter-aquifer connectivity in the permit area and whether there is a need for additional or alternate testing to be conducted within the area to be mined and dewatered. A comprehensive plan for aquifer testing must be developed and approved by NMED to address these concerns.

d) Item 5 discusses establishment of baseline ground water chemistry of area aquifers using historical data and additional sampling of existing wells. NMED should be involved in determining which wells can provide appropriate data and whether additional wells need to be installed. These wells may be used as part of the demonstration discussed in Comment 5 above.

e) Item 7 indicates that ground water samples will be collected from San Mateo Creek alluvium through "shallow auger holes and well points". A comprehensive plan for sampling both shallow alluvial ground water and sediments within San Mateo Creek must be provided to NMED for approval. The plan should be designed to provide data to be used in development of the model proposed in Section 9.2 to determine the potential impacts from the proposed mining operations, and incorporate the sampling plan proposed in Section 8 of the MMD SAP. This must include a determination of the extent of existing saturation within San Mateo Creek alluvium between the discharge point and the Rio San Jose and variability in alluvial ground water quality.

f) Item 8 indicates that three boreholes will be installed across San Mateo Creek (location shown on Figure 9-1). If these are intended as long term monitoring points the wells must be completed in accordance with NMED Monitoring Well Construction and Abandonment Guidelines. These wells may be used as part of the comprehensive plan for sampling shallow alluvial water and sediments within San Mateo Creek alluvium.

12. Section 9.2 indicates that a ground water model will be used to determine potential impacts of mining activities, including dewatering. The model proposal, including proposed inputs must be provided to NMED for approval prior to implementation. The model must evaluate, at a minimum the potential for ground water impacts resulting from dewatering of the Westwater Canyon Member and subsequent recharge of those aquifers affected, and the potential for ground water impacts downstream of the treatment plant discharge, including impacts to San Mateo Creek alluvium and units that are potentially recharged by San Mateo Creek alluvium. This includes evaluation of the potential for

treated water discharged to the surface to mobilize residual contaminants in the alluvial system and the potential to affect aquifers downgradient of the discharge point.

13. Comments on Table 9-2, Ground Water Sampling and Data Analysis Plan:

a) Item 2 indicates RHR will establish baseline chemistry in wells which could potentially be impacted by unanticipated events at the Roca Honda permit area. As noted in Comment 6 above, NMED will require development of a ground water monitoring network down-gradient of the proposed mine facilities. As noted in Comment 5 above, standards established in Section 20.6.2.3103 of the WQCC Regulations apply unless a statistically significant demonstration is made that the background concentrations are higher.

b) Item 3 states that an aquifer test will be conducted using two wells drilled in Section 16 in 2007 by Strathmore. As stated in Comment 11c above, a comprehensive plan for aquifer testing must be developed and approved by NMED.

c) Item 6 discusses installation of a group of wells to be installed in Section 15 to demonstrate baseline water levels, monitor ground water, and obtain baseline aquifer chemistry. These wells should be incorporated into the comprehensive ground water monitoring plan required under Comment 11c above and may be used as part of the demonstration referenced in Comment 5 above.

d) Item 7 proposes to conduct an aquifer pump test on wells installed in Section 15 to determine inter-aquifer connectivity. As mentioned above in Comment 11c, NMED has concerns that this proposed pump test may not provide necessary information.

14. Figure 9-1 shows a well (B-00848-O/S) located in Section 17 to the west of the proposed mine area as a well to be used for monitoring and aquifer testing. It is mentioned in Table 9-4 that this well is completed in the Westwater Canyon Member, but it is not indicated what is known about the construction of this well. Furthermore, it is unclear if water quality data exists for this well. NMED requires additional information regarding the construction and available data for this well.

15. Section 9.4 and Table 9-3 reference a proposed 72 hour pump test for existing Westwater Canyon Member wells. Based on discussion with RHR personnel it is unclear whether this will ultimately be the duration of the pump test or if a longer pump test will be conducted. As previously stated, references to pump test(s) are made at various locations in the administrative record, including a pump test for wells completed in Section 15. NMED has indicated in separate correspondence that a discharge permit would be required for discharge from a pump test and will require a comprehensive proposal for determining aquifer characteristics be submitted with a discharge permit application. Additional comments from the New Mexico Office of the State Engineer must also be addressed during design and implementation of aquifer testing.

16. Table 9-4 provides a summary of wells and well locations and a ground water monitoring schedule. This includes some number of wells that have not yet been installed, nor

locations determined. Section 9.5 discusses a survey conducted by RHR of historical water chemistry data and existing wells, indicating some wells that may be used for establishment of baseline water quality. Criteria is being developed by RHR to determine which wells and data will be used for this effort and NMED should be informed of criteria once developed. NMED should also be notified of those wells that have been eliminated in addition to those being used. As part of this criteria development RHR must provide information on existing wells to establish what formations they are completed in. As noted in Comment 5 above, standards established in Section 20.6.2.3103 of the WQCC Regulations apply unless a statistically significant demonstration is made that the background concentrations are higher. Furthermore, the proposed wells and sampling provided in Table 9-4 should be included as part of the comprehensive ground water monitoring proposal requested in Comment 6 above.

Appendix A, Pump Test Design, DP Application

17. The stated purpose of the aquifer test is to determine aquifer properties of the Westwater Canyon Member. The text indicates that RHR may perform additional tests to determine inter-aquifer connections. As mentioned above, a comprehensive aquifer testing program must be developed to address not only Westwater Canyon Member properties, but to also determine the interconnectivity with overlying aquifers within the mine area. RHR must evaluate subsurface boundaries as stated, as well as the impacts of features such as old exploration boreholes and other wells/shafts (e.g. Lee Ranch shaft) within the area influenced by dewatering. Additional comments from the New Mexico Office of the State Engineer must also be addressed during design and implementation of aquifer testing.

Part C, DP Application

18. In Section C-6, the box is checked indicating that a geologic report is attached. There is a geologic map and a stratigraphic section included with the application but no geologic report. As stated above, NMED requires submittal of Section 7 from the MMD SAP.

19. In Section C-6, the box is checked indicating that well logs are attached. Well logs were submitted for wells S-3 and S-4 only. NMED requires submittal of the well log for S-1 (and S-2 if available) and well completion diagrams for wells S-1, S-3 and S-4.

20. The stratigraphic section provided in Figure 6 should be revised to include the Menfeee Formation.

21. Review of Figures 3 and 5 of Part C indicate that the proposed facilities in Section 10 are situated on Point Lookout Sandstone and colluvium. No discussion is provided regarding what aquifers may be recharged in this area, nor what the first water bearing strata is beneath Section 10 facilities.

Comments on MMD SAP Section 8

22. Section 8.1 states that average discharge will be 4,000 gpm. The DP Application indicates up to 8,000 gpm will be discharged. Please explain this discrepancy and the ramifications regarding the expected distance the discharge will travel within San Mateo Creek.

23. Section 8.1.2.4 shows that the discharge pathway follows a fault trace for some distance prior to confluence with San Mateo Creek (also indicated on Figure 8-6). RHR must provide a discussion regarding the potential that this fault can serve as a pathway to the subsurface.

24. Section 8.1.2.4 states that the San Mateo Creek alluvium may contain water and that the discharge water will be of better quality and will dilute the existing background water quality. It is stated previously that the effects of discharge water on the alluvial system is a "data need" and will be discussed further in Section 9. There is no further discussion regarding this issue in Section 9, either the MMD SAP Section 9 or the DP Application Section 9.

25. Section 8.1.3 mentions that an additional data need is the existing concentration of contaminants in sediments of the unnamed arroyo that will receive the discharge and San Mateo Creek alluvium. The discussion is focused on the potential impacts to surface water "flowing over the sediments". As stated above, a demonstration must be made that water moving thru saturated and unsaturated alluvium below the surface will not mobilize residual contaminants in the alluvial system resulting in an exceedence of Section 20.6.2.3103 standards, in the alluvial system and within water bearing units that subcrop beneath, and are recharged by the San Mateo Creek alluvial system.

26. Figure 8-5 must to show subcrop geology all the way to Rio San Jose and provide the reference for this information. NMED may require additional mapping to verify the accuracy of previous work.

27. Figure 8-7 provides a geologic cross section through Section 16. In addition to inclusion of this figure in the administrative record, NMED requires that similar cross sections be provided thru Sections 9 and 10.

28. Section 8.3, Table 8-4, and Section 8.5.1.4 indicates that sediment sampling will be conducted within San Mateo Creek alluvium. As mentioned in Comment 11e above NMED requires submittal of a comprehensive plan that describes sampling methods and locations to be sampled to demonstrate that discharge to San Mateo Creek will not impact water quality within the San Mateo Creek alluvial aquifer, and within aquifer units that subcrop beneath the San Mateo Creek alluvium. This must include alluvial sediment sampling and analysis at various depths with the San Mateo Creek alluvium to address vertical heterogeneity.

Comments on MMD SAP, Section 9.1

29. Section 9.1.2 states that "Ground water is probably present within deeper permeable formations (e.g., the San Andres Limestone and Entrada Sandstone), but these rocks lie at great depth in the Roca Honda permit area and are separated from mining activities in the Westwater Canyon Member by the Recapture Member of the Morrison Formation and the Wanakah Formation. Ground water within these deep formations will not be impacted by the proposed mining or dewatering and will not be discussed further." NMED requires a technical discussion in support of this statement.

30. Section 9.1.2 states ground water is present in the Crevasse Canyon Formation (Dalton Sandstone member) but there is no further discussion of the location of this aquifer relative to the proposed activities.

31. Section 9.1.2.2 indicates there is possibility for "inter-formation movement of ground water" but gives no basis for this statement. Is this due to faulting (as mentioned in Section 9.1.2 regarding the WW-Dakota), existence of old exploration boreholes, leakage through aquitards or some other mechanism?

32. Section 9.1.2.3 and Section 9.1.3.3 mention recharge of the Point Lookout Sandstone along San Mateo Creek. Figure 7.3 is referenced but this figure does not provide adequate coverage to include San Mateo Creek. RHR must identify areas where San Mateo Creek alluvium is in contact with the Point Lookout Sandstone, in particular where this occurs downgradient of the point where the treatment plant discharge will enter San Mateo Creek.

33. Section 9.1.2.4 mentions that San Mateo Creek alluvium is not in the permit area. It should be noted that the discharge from treatment plant will enter San Mateo Creek alluvium and as such must be included within DP-1717.

34. Section 9.1.3.1 states that TDS in the alluvium is above 14,000 mg/L below the confluence of San Mateo Creek and Arroyo del Puerto. It is not indicated whether this represents historical background water quality or if this is the result of impacts from previous mining operations.

35. Table 9-2 indicates that analytical data is given in mg/L for constituents unless otherwise noted. This indicates metals concentrations for Zn, Cu, Pb, Mn, Al and Fe well above WQCC standards, and high detection limits for other metals. This would appear to be a typographical error. Please clarify.

36. Section 9.1.3.2 indicates the Menefee Formation is located beneath colluvium in the SE corner of Section 10. Where is the Menefee Formation located with respect to the proposed Section 10 facilities and is this a potential recharge zone for the Menefee Formation?

37. Section 9.1.3.2 indicates that the San Mateo Creek alluvium recharges the Menefee Formation, and that the Menefee is hydraulically connected to the Point Lookout Sandstone. It is not indicated where this occurs relative to the proposed surface activities and the treatment plant discharge. Please clarify.

38. Section 9.1.3.3 states that Point Lookout Sandstone crosses thru the "permit area" and is recharged along the Fernandez monocline. Where are the proposed Section 10 facilities located relative to the Point Lookout Sandstone and the contact with the overlying Menefee Formation?

39. Section 9.1.3.7 states that TDS in the Westwater Canyon Member near the confluence of San Mateo Creek and Arroyo del Puerto is high (~2000 mg/L) due to downward movement of poor quality water from the alluvium. Is this a result of natural conditions or due to previous mining impacts, and are these impacts from the Arroyo del Puerto, San Mateo Creek alluvium, or both?

40. Section 9.1.3.7 provides historical Westwater Canyon Member water quality data from three mines (Table 9-9) nearby and suggests the water quality represents mixing with poorer quality Dakota Sandstone water. Further it is suggested that ground water pumped from the RHR mine will be of similar quality. Data collected during the past year from three wells onsite indicate better water quality in the permit area. Please explain.

41. Section 9.1.4.2 discusses the potential connection between the Dakota Sandstone and Westwater Canyon Member. This Section states that "...the limited thickness of the Brushy Basin Member shales in the permit area make it possible that the formation does not form an impermeable hydrogeologic barrier to movement of ground water..." The given thickness of the Brushy Basin Member from well logs onsite is 269 ft, near the upper end of the historically documented thickness (125"-300'). Faulting or old bore holes may provide a connection. Water quality from onsite wells appears to be substantially better than that provided in Table 9-9. Please explain.

42. There are many references within the MMD SAP to the permit area, which may be appropriate as this was initially submitted to MMD. RHR will need to expand its discussion to include the area along the length of San Mateo Creek that will potentially be impacted by discharge from the water treatment plant, and ground water down gradient of the surface facilities and subsurface mine. Pursuant to the WQCC Regulations a demonstration must be made that ground water standards will not be exceeded, irrespective of permit and facility boundaries.

43. Tables 9.2, 9.3, 9.4, 9.5, 9.6 and 9.7 include data from the 1970's. More recent data is available as a result of RHR sampling efforts and should be provided to NMED.

NMED requests that RHR respond to this request for additional information within 60 days of the date of this letter. NEMD recognizes that some of the comments will require additional time to address. As such, NMED requests to meet with RHR to develop a schedule to respond to comments that may take longer than 60 days to address.

If you have any questions, please contact me at 505-827-0195.

Sincerely,

Kurt Vollbrecht, Geologist
Ground Water Quality Bureau
Mining Environmental Compliance Section

cc: Chuck Thomas, Chief, Mine Reclamation Bureau
Glenn Saums, Acting Chief, NMED SWQB
Mary Ann Menetrey, GWQB MECS
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