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WHARF RESOURCES (USA) INC.

October 5, 2011

Mr. Eric Holm
Department of Environment and Natural Resources
Office of Minerals and Mining
Joe Foss Building
5223 East Capitol
Pierre, SD 57501-3181

Re: Wharf Resources Large Scale Mine Permit Application

Dear Mr. Holm:

Wharf Resources (USA), Inc. is submitting additional information to the application for its large-scale mining permit application. This information is in response to the South Dakota Department of Environmental and Natural Resources (SD DENR) review and comments made in technical comments letter addressed to Wharf and dated August 30, 2011. Comments are addressed in this letter along with attached exhibits, tables, and data sheets.

Documentation from the Lawrence County Register of Deeds offices stating this information is on file for public viewing will be provided, when available. Electronic copies of this information were also sent to the following review agencies: S.D. Department of Health, S.D. Department of Agriculture, S.D. Archaeological Research Center, S.D. State Historical Society, S.D. Department of Tourism and State Development, S.D. Department of Education and Cultural Affairs, S.D. Department of Game, Fish, & Parks, U.S. Department of Game, Fish, & Parks, U.S.D.A. Natural Resource Conservation Service, Bureau of Land Management, and the Lawrence County Conservation District. Proof of submission will be provided to the SD DENR when available.

If you have any questions or require further information, please contact me at 605.584.4177.

Sincerely,

Ken Nelson
Operations Manager

Ron Waterland
Environmental Manager

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WHARF RESOURCES (USA) INC.

Response to letter from the SD DENR dated August 30, 2011

1. Table 3-1, page 22 and Table 3-2B, page 27 – Some of the ore and waste rock estimates listed in Table 3-2B do not match the totals listed in Table 3-1 on page 22 of the application. The following are the discrepancies we noted between the two tables:

   Golden Reward Pits: The 19,000 tons of barren Phonolite Porphyry rock shown in Table 3-1 is not shown in Table 3-2B.

   Wharf Pits: In Table 3-1, the total Deadwood Upper Contact barren rock is 21,400,000 tons while in Table 3-2B, the total between the three Wharf pits is 21,850,000 tons. Which is correct? Also, in Table 3-1 the total Deadwood Intermediate Sediments barren rock is 48,000,000 tons while in Table 3-2B, the total between the three Wharf pits is 47,999,930 tons. Which is correct? Finally, in Table 3-1 the total Phonolite Porphyry barren rock is 9,600,000 tons while in Table 3-2B, the total between the three Wharf pits is 9,200,000 tons. Which is correct?

   The column headings "Discard (Tons)" and "Ore (Tons)" under "Percentage Totals" in Table 3-1 need to be reversed.

   Tables 3-1 and 3-2B have been corrected and are attached.

2. Section 3.1.3.1.7, page 29 - In this section, Wharf discusses ARD potential at Harmony Hill, the saddle between Green Mountain and Bald Mountain (east end of Green Mountain Pit), and the Flossie area. Wharf needs to clarify ABA sampling results by providing a relatively large-scale map of each of these three areas. The maps must show precise test hole locations (i.e., use a labeled point to depict hole sites, not just the hole ID#), and delineate any Special Handling Material (SHM) identified at each of the three sites.

   Also, Wharf states, "The SHM #2 is located in the Harmony Highwall and is comprised of four samples that indicate potential for ARD. SHM #2 has a projected size of less than 10,000 tons and consists of four samples that are surrounded by adjacent material so that it can be mined and blended to ensure a 3:1 NP:AP ratio and 20 NNP value." In addition to the four potentially acid generating samples Wharf classified as "SHM #2", there appears to be a second cluster of low NNP-value samples approximately 200 feet southwest of SHM#2 (see enclosed *Figure 1 Monzonite ABA Sample Sites Harmony Hill*). This potentially acid generating area needs to be addressed in the application narrative. Also, Wharf needs to address whether this second cluster represents a discrete pod of acid generating rock, or if the two clusters comprise a larger area of potentially acid generating monzonite at Harmony Hill.

   Maps have been updated with hole label points and new SHM sites.

Two additional SHM areas have been added, the first SHM#3 is located south of SHM#2 within the Harmony pushback and is comprised of ABA samples that indicate potential for ARD that are intermixed with samples that have neutralizing capability. The area will be further delineated to determine the full size and the appropriate amount of blend material to ensure a 3:1 NP:AP ratio and 20 NNP value. In addition, two humidity cells will be completed before hand to determine the extent of the ARD potential of this area.

The current geological information does not indicate that SHM#2 and SHM#3 are interconnected representing a larger pod of potential ARD material. The two (2) special handling zones are separated by a distinct boundary of buffering material. As stated above, additional drilling will be completed around both zones before mining to delineate the size and extent of each so that proper handling measures can be realized.

Exhibits 10, 10.1, 10.2, 10.3 have all been updated.

3. Section 3.1.3.1.7, page 30 – Regarding the Flossie area, what is the status of the additional humidity cell testing for this area? If the humidity cell testing has not been started or is not yet complete, a condition will need to be placed on the permit requiring humidity cell testing or other appropriate testing be done for the Flossie area.

Also, Wharf states "The Green Mountain area overall has a very large NNP and NP:AP ratio within all rock types to be mined, with a low nonsulfate sulfur content indicating low ARD potential. There are random hits within the pit boundary that indicate a potential for ARD under the California criteria, but these samples are isolated and not clustered together. The Green Mountain Pit took into consideration the ARD potential of the Deadwood lower contact when the pit was designed so as not to include any clusters of ARD potential material. Much of the ARD material was located on the eastern edge of the pit along Bald Mountain where the Deadwood lower contact comes in contact with the Precambrian rocks; in this area the pit was finalized above these areas so as not to mine any ARD potential material." This assessment appears to be inconsistent with the ABA data and maps submitted with the revised application (June, 2011). There appears to be a significant cluster of acid generating samples associated with both the intermediate Deadwood and the monzonite sill underlying the western slope of Bald Mountain (see *Figure 2 Monzonite ABA Sample Sites Green Mountain and Bald Mountain* and *Figure 3 Intermediate Deadwood ABA Sample Sites Green Mountain and Bald Mountain*). Most of these acid generating samples were classified as "in pit". Wharf needs to either address why Deadwood sediments and the monzonite underlying the saddle between Green Mountain and Bald Mountain were not identified as Special Handling Material (SHM), or designate material in this area as SHM. Wharf also needs to identify how much acid generating material they plan to remove from this area.

In addition, Wharf states, "The Green Mountain Pit took into consideration the ARD potential of the Deadwood lower contact when the pit was designed so as not to include any clusters of ARD potential material. Much of the ARD material was located on the eastern edge of the pit along Bald Mountain where the Deadwood lower contact comes in contact with the Precambrian rocks; in this area the pit was finalized above these areas so as not to mine any ARD potential material." Exhibit #6 (Current Green Mountain Geologic Cross Sections—4-18-2011), cross section I – I' appears to be inconsistent with this plan to finalize the pit bottom above lowest horizon of the lower Deadwood.

Finally, Cross Section I – I' appears to transect a cluster of potentially acid generating lower Deadwood sample sites along the western flank of Bald Mountain. The ABA data tables submitted in June, 2011 classify most of these potentially acid generating sample sites as "below pit", which is consistent with the plan to finalize the pit above the lowest horizon of the lower Deadwood. However, Cross Section I-I' indicates that the pit floor will be mined down to the Precambrian contact across most of the western flank of Bald Mountain. The apparent discrepancy between Exhibit 6, Cross Section I – I' and this narrative needs to be reconciled.

Humidity cells for Flossie are in progress and should be complete by year end, results will be forwarded with summary to the DENR once complete.

One special handling material zone was identified on the eastern edge of Bald Mountain, SHM#4. Based on ABA results this area shows ARD potential material intermixed throughout the zone with neutralizing material within the Deadwood intermediate sediments and porphyry unit. This area has been estimated to be approximately 55,000 tons of intermixed ARD potential and neutralizing material, this amount will be delineated even further before mining to assure proper handling. Three (3) humidity cells will be completed within this area to determine if there is ARD potential for this area and to what extent the material will require blending or special handling.

Exhibit #6 and cross section I - I' will be adjusted to reflect narrative. The cross section indicates the pit limit at the interface of the Deadwood lower contact and the Precambrian rock units but does not show the detail what the narrative states in leaving Cdlc behind where it is pertinent.

Any identified acid generating material be it Cdlc, Tm, or other units that are at pit bottom or come in contact with the Precambrian at pit bottom will be left in-place. There is no planned Precambrian to be mined.

4. Section 3.1.3.6, page 37 – In the last paragraph of this section, Wharf states the Liberty Pit was one of the pits in the 28 years of mining that had no ARD problems. This is not a

correct statement as acid drainage was noted in the pit during mining. Wharf needs to acknowledge the pit did have acid drainage during past mining. The company also needs to address how acid drainage will be monitored, prevented and /or mitigated during mining of the Golden Reward Pit.

Also, in the same paragraph, Wharf states the Flossie area will be discussed in the upcoming section. However, there is nothing mentioned of the Flossie area in the remaining sections of 3.1.3.6.

Wharf acknowledges that the Liberty Pit did have acid drainage in selected spots during past mining. As stated in the LSMP any ARD issues will follow the ARD Protocol that was explained in the application at both Wharf Resources and Golden Reward.

Concerning the narrative of Flossie, this was addressed in section 3.1.3.1.7 and not 3.1.3.6.

5. Section 3.1.3.7 – Section 3.1.3.7 does not exist in the June 2011 revised application. However, it is still referred to in sections 3.1.3.1.6, 3.1.3.3, 3.1.3.5, and 3.3.2.1, and on Table 1-2 of the revised application. It appears that subsections in Section 3.1.3.6 replaced the old Section 3.1.3.7.

It is noted that Section 3.1.3.7 was renumbered by subsections in Section 3.1.3.6.

6. Section 3.3.2.2, pages 45 to 47 – Please give an update on the latest status of nitrate mitigation in groundwater in the process area. This should include recent improvements and planned/scheduled improvements regarding nitrate treatment for the remainder of 2011. This would include any relining projects, an additional Blue Water Plant, and changes to denitrification processes (i.e., pump and treat, in situ methods, etc.).

During the fourth quarter of 2011 a new denitrification plant will be constructed within the process area for the reduction of nitrates within the pore water coming from the heap leach pads so that pads can be unloaded within a POP zone. The denitrification plant will also remove nitrates from pond water that has been collected through meteoric events and extra process solution that has be neutralized to meet groundwater discharge requirements. The plant will allow Wharf to treat water year round and manage the water balance needs more effectively and efficiently.

Improvements scheduled for 2012 within the Process area include the relining of the Barren Pond, relining of Pad 4 and relining and repair of Pad 4 dam.

Include the following: The first injection of inoculums was started in September with the first of the planned injections occurring the week of September 12, 2011. The injection well IW-5 near the south west corner of the contingency Pond received the first injection. IW-5 is located at the down gradient edge of the nitrate contamination plume. Once the indicator monitoring parameters are detected in the primary monitoring wells for IW-5 planned injections will proceed one at a time into injection wells on a line along the south side of the process area from west to east. Continued monitoring of each injection will dictate the frequency of subsequent injections of inoculums into the process area injection wells. Plans are to complete one injection of inoculums into each of the eight injection wells in 2011 and determine the frequency of continued injections.

7. Section 3.3.4, page 49 and Section 3.4.3, page 52 – In these sections, Wharf mentions the spent ore and waste rock study conducted by ERM. Wharf states the study shows there will be no adverse impacts to surface and ground water. Wharf should also explain the modeling results for arsenic and nitrates in the study.

A numerical groundwater model of the Wharf Mine and surrounding area was developed to determine the fate and transport of nitrate and arsenic discharged from the spent ore and barren rock disposal areas into the groundwater, and the potential future impacts on groundwater and surface water quality at the mine site. The groundwater model simulations indicate that the potential future impacts of the nitrate and arsenic from the spent ore and barren rock on groundwater and surface water quality at the mine site will probably be minimal. Nitrate concentrations above the 10 mg/L groundwater standard will only occur within the current mine permit boundary, and will decrease over time due to dilution and attenuation. The nitrate concentrations should also remain well below the 50 mg/L regulatory standard for surface water and any discharge of nitrate-impacted groundwater to streams at the mine site should not impact future surface water quality. The model simulations also indicate that arsenic concentrations will remain below groundwater standards and any discharge of arsenic impacted groundwater to streams at the mine site should not impact future surface water quality.

8. Section 3.4, pages 49 and 50 – In the second paragraph on page 49, please clarify the tributaries that have proposed surface disturbance within their drainage basins. For example, in Section 3.4.2 on page 51, Wharf states it does not plan on disturbing any land in the Long Valley drainage.

Tributaries that have proposed surface mining disturbance related to the Expansion Project within their drainage basins include: Deadwood Creek, Nevada Gulch, Fantail Creek, Lost Camp Gulch, Stewart Gulch, Annie Creek, and Whitetail Creek. Two additional tributaries, Long Valley and McKinley Gulch, are listed in Section 3.4, but these drainages do not have planned surface mining disturbance. Current operational

plans for the expansion area in Section 33, T5N, R2E, propose this area may be used for a roadway, utility corridors, or parking lot space (as described in Section 5.2).

Also, please list the tributaries that have current surface disturbance within their drainage basins.

Streams and tributaries that have current surface disturbance, associated with Wharf or Golden Reward Mines, within their drainage basins include: McKinley Gulch, Annie Creek, Labrador Gulch, Cleopatra Creek, False Bottom Creek, Deadwood Creek, Whitetail Creek, Stewart Gulch, Fantail Creek, and Nevada Gulch.

On page 50, Wharf needs to acknowledge that Upper Fantail Creek where mining will take place is a channel reconstructed during final reclamation of the Golden Reward Mine. Even though there is no flow now, there may be flow in the channel in the future as the fines plug off voids in the waste rock backfill on which the channel was constructed.

Wharf acknowledges the comment on Upper Fantail Creek.

Also, Wharf needs to discuss the extent of the actual Nevada Gulch Creek drainage in this section.

For much of its length in Sections 1 and 2, T4N, R2E, Nevada Gulch Creek is intermittent. The drainage channel south of the Nevada Gulch access road at the base of the Avalanche Ski Run often has very low flows for less than 50 feet, before the channel runs into a historic mine adit near the Horseshoe Well. At the Blue Chair parking lot, the drainage is underneath the parking area as illustrated on Exhibit 29.1.

9. Section 3.5.3, pages 53 and 54 – Due to concerns with air quality impacts to residences in the Lost Camp area and the new residential areas near Golden Reward, we discussed Wharf's current air monitoring program with the Air Quality Program. The department will require through permit conditions that in addition to the current EPA Method 9 visible emissions monitoring program, Wharf will also conducted PM-10 monitoring with one up-gradient and two down-gradient monitoring sites.

This issue is discussed within the permit conditions.

10. Section 5.2, page 94 – In the paragraph at the top of page 94, Wharf states the Green Mountain and Bald Mountain highwalls will be backfilled within 60 to 80 feet of the top which implies a portion of the highwalls will remain. However, in the last paragraph on page 100, it states all of the Green Mountain and Bald Mountain highwalls will be backfilled. Which statement is correct?

All of the highwalls in Green Mountain and Bald Mountain will be backfilled completely.

11. Section 5.3.3, page 97 – Regarding the reclamation of the Bald Mountain Tailings mentioned in the fourth paragraph, Wharf needs to acknowledge that the upper two-thirds portion of the tailings was covered with waste rock from the Trojan Pit and covered with topsoil as part of the Large Scale Mine Permit No. 464. Wharf also needs to acknowledge even though there was very little subsoil in the rock borrow areas, there were sufficient fines in the rock material to support vegetation.

Wharf acknowledges this statement.

12. Section 5.3.5, page 101 – In the first paragraph, Wharf states there are no intermittent or perennial streams in Upper Fantail Gulch. During the mine permit audit, we agreed that the reconstructed portion of the Upper Fantail Gulch Creek is still considered an intermittent drainage that is not carrying flow at this time. Please modify this section to state that there is an intermittent stream in upper Fantail Gulch.

Wharf agrees that there is an intermittent stream in upper Fantail Gulch.

13. Section 6.2.1, page 112 – In the second paragraph, Wharf states the department has approved the reclamation of significant acreages at Wharf and Golden Reward. This statement needs to be revised to acknowledge that the department has determined that approximately 270 reclaimed acres at the Wharf Mine meet the post mine land use and about 403 reclaimed acres have been released at the Golden Reward Mine.

Wharf acknowledges that the DENR has determined that approximately 270 acres at the Wharf Mine meet the post mine land use and about 403 reclaimed acres have been released at the Golden Reward Mine.

14. Section 6.5.2, pages 122 and 123 – The second paragraph on page 122 of this section is repeated on page 123.

Noted.

15. Section 6.7.1, page 126 – Since the Portland Ridgeline Pit will be the only pit with remaining highwalls, the discussion of pit highwall bench reclamation and talus slope construction should be limited to just the Portland Ridgeline Pit.

Noted. The Portland Ridgeline Pit is the only pit with remaining highwalls.

16. Section 6.7.2, page 127 – The reclamation of the haul road between the Golden Reward and Wharf Mines should also be mentioned in this section.

Reclamation of the haul road between Wharf Resources and Golden Road, which includes the parking lot of the Terry Peak ski area at Nevada Gulch will be reclaimed seasonally to its original form so that it can continually be used as a parking lot, which amounts to minor grading and sloping. Areas outside of the parking lot along the haul road will be reclaimed to meet the required reclamation standards of those areas.

17. Section 6.10, pages 129 to 133 – The current postclosure bond in the amount of $8,154,500 for the Wharf Mine covers a postclosure period of 50 years. However, Wharf's estimate in the mine permit application only covers a postclosure period of 30 years. Please explain why Wharf reduced the postclosure bond period from 50 years to 30 years.

Also, please provide updated costs for pad neutralization and the water treatment process. Please provide separate detailed monthly costs for pad neutralization and water treatment for the following items:

a. Electrical costs to run pumps and other items to neutralize the pads;
b. Electrical costs for heat, light and other items in the process plant;
c. Electrical costs to operate pumps and other items in entire water treatment process;
d. Electrical costs for heat, light and other items in the water treatment process;
e. Cost of reagents to neutralize and denitrify the leach pads;
f. Cost of reagents used in water treatment process;
g. Labor costs, including number of workers;
h. Potable water system operating costs;
i. Phone and radios;
j. Trash pickup and disposal;
k. Computer and internet;
l. Truck lease;
m. Gasoline and diesel; and
n. Miscellaneous office supplies

It would be help to provide a list of pumps with hours operated each month, the horse power of each pump, the electrical usage in kilowatt-hours, and the current electrical rates at the mine per kilowatt- hour.

An updated bond that includes water treatment and monitoring costs for 50 years has been sent to Eric via e-mail. Exhibit 21 has been updated to distinguish the outline of the affected acres for the haul road between Wharf and GR, and the area north of the process area pads at Wharf.

18. Table 6-5, page 130 and Table 6-5A, page 134 –Tables 6-5 and 6-5A do not appear to show costs or quantities for off-loading of the final heap leach pads to backfill pits

(Portland Ridgeline Pit). Section 5.4 states that the final heap leach pads will be off-loaded (10 million tons) to the Portland Ridgeline Pit. Also, in Section 6.10.2.5 it states that final heap leach pads are anticipated to be unloaded.

In addition, Tables 6-5 and 6-5A do not appear to show costs or quantities for regrading and reclaiming the haul road between Golden Reward and Wharf.

Finally, Table 6-5A was located in Section 6.10.2.1, Introduction to the Postclosure Plan, which was confusing. It should have immediately followed Table 6-5.

Cost for unload of final pads will be included in Tables 6-5 and 6-5A. The final pads will be off loaded.

Costs for regrading the haul road between Wharf and Golden Reward have been added to Table 6-5 and 6-5A.

19. Exhibits 6 and 25 - According to ABA data and maps included in the revised application, Precambrian material underlying the eastern edge of the Green Mountain Pit consists of strongly acid generating rock. Cross Section I – I' indicates a portion of the eastern Green Mountain Pit floor will be excavated down to this strongly acid generating rock. This proposed area of Precambrian pit floor is located immediately upgradient of the Nevada Gulch drainage, and is characterized by a relatively steep slope. Please clarify whether or not Wharf intends to mine portions of the eastern Green Mountain Pit down to the Precambrian contact.

Also, If the pit floor in Exhibit #6, Cross Section I – I' is revised, then Cross Section I – I' also needs to be adjusted in Exhibit #25.

Portions of Green Mountain maybe mined to the Precambrian unless there is indication of ARD generating material, in which mining will cease before any ARD material is exposed. In addition, the ARD Management Plan will be followed.

Exhibits have been fixed.

20. Exhibit 7 – Cross section K-K' still shows a small portion of the Precambrian formation being mined. Is this cross-section correct?

No Precambrian will be mined. Exhibit 7 Cross section K-K' is fixed.

21. Exhibit 21 – A small portion of the fence line around the haul road is outside the proposed expansion permit boundary (see attached map). Wharf may want to consider moving the permit boundary as shown on the attached map so that the fencing

disturbance is inside the permit boundary and Wharf has some room to move the haul road if necessary.

Wharf will leave the permit boundary as is and the fence location. Exhibit 21 has been updated to distinguish the outline of the affected acres for the haul road between Wharf and GR, and the area north of the process area pads at Wharf.

22. Exhibit 23.1 – Please show the outline of the remaining portion of the haul road to be used by the Black Hills Chairlift Association. Also, please show the upper Nevada Gulch drainage in the haul road area.

Exhibit 23.1 fixed as noted. The haul road remaining between Wharf and Golden Reward will remain intact for the use of parking and roadway for Terry Peak Ski Area, minor grading and sloping will be required for final.

23. Exhibits 29 and 29.1 – During the June 29 and 39 permit audit, we determined Nevada Gulch Creek extends farther to the north and west of the location shown in Exhibit 29. In fact, we found a flowing stream channel to the south of the current access road in the gulch that flows under the blue chair parking lot and exits at the point shown on the exhibit where Wharf claimed the stream started. Please show the entire Nevada Gulch Creek drainage on the plan view drawing of the haul road in Exhibits 29 and 29.1, including the flow route under the parking lot.

Exhibit 29 and 29.1 have included changes of Nevada Gulch Creek.

All of the drainage channels in Nevada Gulch near and up-stream of the Blue Chair parking lot were checked in September. In September the drainage channel south of the Nevada Gulch access road at the base of the Avalanche Ski Run had water in it with a very low flow for less than 50 feet. Upon investigation it was discovered that that particular channel ran into a historic mine adit near the horseshoe well.

24. Appendix 17 – Technical Revisions – Regarding Technical Revision Categories under ARSD 74:29:03:16, Wharf could add the following categories:

a. A technical revision category for changing aspects of the recreational, homesite, industrial (commercial) landuses that do not conflict with statutes or regulations. At this point, there are only conceptual plans for these landuses, and having technical revision authority would allow some flexibility in future planning and submittal of final drawings;

Noted and agreed.

b. In the Clinton technical revision list, no. 35 states "Build a permanent heap leach pad to improve leaching, recovery, or environmental aspects". Although this would include lined impoundments for denitrification purposes, it may be better to have a separate category for lined impoundments used for environmental purposes;

Noted and agreed.

c. Regarding the adding contiguous, affected land technical revision category, Section 2.0 of the June 2011 Application Revision 1.0, listed 298 acres will be affected. This figure should not include any redisturbed acreage, unless that acreage was released of reclamation liability by the Board of Minerals and Environment (i.e., the acres released at Golden Reward Permit No. 450, since January 2009). Twenty per cent of 298 acres would be 59.6 acres; and

Acreage is current undisturbed.

d. A new technical revision category regarding stabilizing highwalls. This would include the highwalls to the west and south of the Terry Cemetery.

Noted and agreed.

25. The mine expansion permit application calls for the mining of 25,580,000 tons of ore. However, the American Eagle Ground Water Discharge permit application mentions 30,000,000 tons of spent ore will be disposed. Please explain the apparent discrepancy.

The discrepancy has to do with tons on current pad to be unloaded.

Appendix 6 Groundwater

1. Section 3.5.3 – It is noted in this section that several parameters exceed the South Dakota ground water standards. This section then goes on to explain the parameters that exceed drinking water standards and uses drinking water standards in Table 3-6. Please note that the listed South Dakota groundwater standards are equivalent to drinking water standards, however, the drinking water standards have a larger parameter list than the South Dakota ground water standards. For instance, South Dakota ground water standards do not have limits for aluminum, iron, or manganese. These are strictly secondary drinking water standards and are not enforceable in this state. It has not been indicated that any of these wells, with the exception of PW-2, are to be used as a drinking water source and are strictly for monitoring purposes. As such, the South Dakota ground water standards are more appropriate for use to determine an exceedence for constituents of concern. These standards are listed in Tables 1 and 2 of ARSD 74:54:01:04.

Though not explicitly stated in the groundwater report, the US EPA drinking water standards and South Dakota groundwater standards are equivalent in value. Though South Dakota does not enforce secondary standards listed by the EPA, the report Section 3.5.3 contains discussion of exceedences on secondary standards including aluminum, iron, and manganese. It should be noted that these discussions on secondary standards are not to be used to determine constituents of concern. With the exception of well PW-2, all the baseline sampled wells are not to be used as a drinking water source.

2. Section 3.5.3 – There are several instances in this section of arsenic values exceeding the standard. Please provide a discussion of ambient arsenic conditions in various areas of the mine to show whether any of these exceedences are normal for the given area or if the exceedences may be due to other causes.

Within Section 3.5.3, there are several instances of arsenic values that are near or above the groundwater standard of 0.010 mg/L. Of the baseline wells, arsenic standards were exceeded in well MW-19, SM03A, SM06, SM10, OM-05, Terry Peak well, Foley Shaft, and the Railroad well. The presence of arsenic in area groundwater is primarily a naturally occurring phenomenon. This natural background arsenic is associated with Precambrian phyllite and graphitic schist as well as sulfate and iron rich rock types which may be arseniferous. The Railroad well, Terry Peak well, and the Foley shaft are all screened or open to the Precambrian, explaining why these wells have the highest arsenic concentrations despite being primarily upgradient of mining operations. Arsenic concentrations in other local monitoring wells including MW-42 and MW-43, also screened within the Precambrian, have also been consistently near or above the regulatory standard for arsenic. Other baseline monitoring wells near Golden Reward also exceed the standard, and are likely influenced by the geochemistry of the surrounding Precambrian bedrock even if the wells themselves are not directly screened within the Precambrian. Because of such high and variable background levels of arsenic across the site, it is difficult to determine if any other non-natural sources may be influencing arsenic levels in these particular wells.

3. Appendix E – While reviewing the data it was noted that Field Depth was reported to the nearest 0.1 ft while the provided sampling procedure in Appendix D indicates that Field Depth should be reported to the nearest 0.01ft. A second initial review of the lab data sheets indicate the values provided in Appendix E were rounded. Please report these values as they are recorded from the field.

Field depth is measured with a water level indicator and reported to the nearest 0.1 feet. Depending upon equipment and field conditions, field depths may also be recorded to greater accuracy. The sampling procedure in Appendix D regarding field depth reporting to the nearest 0.01 feet is inaccurate.

4. Lab Data Sheets – Data sheets not officially approved by the lab were not provided fot he the following:

   a. Horseshoe Well for sample dates 9/24/2010 and 11/24/2010;
   b. Nevada Gulch Well – 10/29/10;
   c. Terry Peak Well – 11/24/10; and
   d. Railroad MW – 8/28/10, 9/24/10, and 11/24/10.

   Please provide a copy of the lab approved data sheets for each of the above samples.

   Approved laboratory data sheets for the samples noted are attached.

5. Lab Data Sheets – Several lab data sheets indicate that the sample was received out of holding time for turbidity which is 48 hours. Please ensure that samples are provided to the lab in time to perform the necessary analyses. This should be addressed in the sampling procedures.

   Current sampling procedures dictate that samples are collected, preserved, cooled as described in the SOP. Wharf strives to transport the samples to the laboratory usually on the same day they are collected. On rare occasion, circumstances such as weather, special sampling events, or mechanical troubles have resulted in transportation delays, though all efforts are made to ensure the timely transportation of samples being analyzed within set holding times.

6. Appendix E – There are several incorrect data points on the tables in this Appendix. This data may be incorrect through improper rounding or by not accurately reporting the lab analyzed value. Please verify and if necessary, correct the following data:

   a. Horseshoe Well – Field depth (all);
   b. Nevada Gulch Well – Anion-Cation Bal: 7/28/2010; Boron (total): 5/19/2010; Cobalt (diss): 1/21/2010, 2/24/2010, 3/17/2010; Molybdenum (diss): 5/19/2010; Nickel (diss): 1/21/2010, 4/27/2010, 11/24/2010 and; Zinc (diss): 1/21/2010, 2/24/2010, 3/17/2010, 7/28/2010; Gross Beta: 4/21/2011;
   c. Foley Shaft – Boron (total): 8/31/2010; Field Depth: 1/18/2010, 4/12/2010, 6/17/2010, 8/31/2010, 9/24/2010, and 10/28/2010; Radon 222: 11/5/2009;

d. Terry Peak Well – Arsenic (tot. rec.): 1/26/2011; boron (total): 9/30/2010; manganese (diss): 5/25/2010;
e. Railroad MW – Boron (total): 2/23/2010, 6/25/2010, 8/26/2010, 9/24/2010; cadmium (diss): 1/21/2010; Field depth: 1/21/2010, 3/24/2010, 4/27/2010, 6/25/2010, 7/28/2010, 8/26/2010, 10/28/2010, 11/24/2010;
f. MW-19 – No field data entered for 2006, 11/19/2008, and 1/13/2009; copper (diss): 5/20/2008; field depth: 4/29/2009, 5/14/2009, 1/26/2010, 4/5/2010, 5/4/2010, 8/5/2010, 1/21/2010; lead (diss): 5/20/2008; zinc (diss): 5/20/2008;
g. MW-33 – Anion-Cation bal: 8/8/2006; No field data entered for 2006, 11/18/2008, 1/13/2009; field cond.: 5/4/2010; field depth: 5/14/2009, 8/12/2009, 1/26/2010, 5/4/2010, 8/5/2010;
h. MW-40 – No field data entered for 11/3/2005, all of 2006, 11/5/2008, and 1/21/2009; field depth: 1/10/2008, 6/12/2008, 4/16/2009, 5/27/2009, 6/10/2009, 8/11/2009, 4/7/2010, 5/18/2010, 8/26/2010, 1/21/2010; zinc (diss): 11/5/2008;
i. SM01A – No field data entered for 2006, 1/22/2009, and 8/12/2010; Field cond: 8/15/2007, 1/30/2008, 4/24/2008, 6/18/2008, 4/22/2009, and 5/20/2009;
j. SM02A – Copper (diss): 6/24/2008, no field data entered for 2006 and 8/12/2010; field depth: 8/16/2007; fluoride: 8/12/2010; zinc (diss): 6/24/2008, 4/22/2010, 1/7/2011;
k. SM03A – Barium (diss): 8/28/2008, 1/26/2009; No field data entered for 2006, 1/26/2009 and 8/12/2010; field depth: 4/26/2010, 5/26/2010, 1/7/2011;
l. MM04A – No field data entered for 2006, 1/26/2009, and 8/12/2010; field depth: 1/4/2007, 1/19/2010, 4/22/2010, 5/26/2010;
m. SM06 – Chloride: 5/26/2007; No field data entered for 2006, 1/27/2009; field depth: 1/4/2007, 1/19/2010, 4/26/2010;
n. SM09 – No field data entered for 2006and 8/12/2010; field depth: 9/26/2007;
o. SM10 – Arsenic (diss): 6/17/2009; barium (diss): 8/14/2007, 6/17/2009; bicarbonate: 8/14/2007, 6/17/2009; carbonate: 6/17/2009; chloride: 6/30/2010; conductivity: 8/14/2007, 6/17/2009; no field data entered for 2006 and 1/26/2009; field depth: 1/3/2007, 1/26/2011; fluoride: 8/14/2007, 6/17/2009; gold (diss): 8/14/2007; iron (diss): 8/14/2007, 6/17/2009; lead (diss): 8/14/2007; nitrate: 8/14/2007, 6/30/2010; pH: 8/14/2007, 6/17/2009; sodium: 8/14/2007, 6/17/2009, 6/30/2010; sulfate: 8/14/2007, 6/17/2009, 6/30/2010; TDS: 8/14/2007, 6/17/2009, 6/30/2010;
p. OM05 – No field data entered for 2006 and 1/26/2009; field depth: 1/19/2010;
q. PW-2 – 4/7/2011: only field data entered please fill in the remainder of the values; field depth: 10/6/2010;
r. Beaver Springs – Arsenic (diss): 5/13/2008, 1/13/2009; no field data entered for 2006, 1/13/2009; field flow: 1/25/2008, 4/8/2008; selenium (diss): 5/3/2010; zinc (diss): 5/13/2008; and
s. Ross Springs – Anion-cation bal: 5/7/2008, 1/7/2009; no field data entered for 2006, 6/10/2008, 9/18/2008, 10/30/2008, 11/13/2008, 12/12/2008, and 1/7/2009; field flow: 2/22/2008, 3/19/2008, 4/2/2008, 7/10/2008, 8/13/2008, 2/5/2009,

3/5/2009, 10/14/2009; field cond: 8/3/2010; field ORP: 4/8/2009; selenium (diss): 6/10/2008, 9/1/2009; silver (diss): 8/13/2008; zinc (diss): 3/5/2009.

Field data should be verified using field notes as there were several inconsistencies within annual reports between what was provided to the lab and placed on lab sheets and information provided in the data summary sheet for each site. Also, some of the inconsistencies above may be due to averaging samples taken by both DENR and Wharf on the same day. If this is the case, please separate the two data sets and report them individually on the tables. All DENR data should be noted on the table as being from DENR.

Incorrect data within Appendix E tables as indicated by the DENR have been corrected and revised tables are attached. Missing field data has been included as available; some older field notes were not able to be located.

7. Appendix E – Please provide lab sheets for the following ground water sites and dates:

a. Horseshoe Well – 12/17/2009;
b. Nevada Gulch Well – 8/29/2007, 11/10/2009, and 12/17/2009;
c. Foley Shaft – 11/5/2009 and 12/17/2009;
d. Terry Peak Well – 11/2/2006, 11/16/2006, 11/26/2006, 1/1/2007, 11/10/2007, and 12/7/2009;
e. MW-19 – 6/18/2009*;
f. MW-33 – 6/18/2009*;
g. SM01A – 9/26/2007, 10/8/2008, 6/17/2009*,and 6/30/2009*;
h. SM02A – 10/15/2008;
i. SM03A – 6/17/2009*and 6/29/10*;
j. SM06 – 9/26/2007 and 6/17/2009*;
k. SM09 – 9/26/2007 and 10/15/2008;
l. SM10 – 6/21/2006*, 6/18/2008*, 10/15/2008, and 10/20/2008;
m. Beaver Springs – 2/13/2008, 6/18/2009*, and 10/7/2009;
n. Ross Springs – 3/6/2006, 4/17/2006, 5/15/2006, 5/30/2006, 6/26/2006, 7/12/2006, 7/24/2006, 8/23/2006, 9/6/2006, 9/19/2006, 10/4/2006, 10/18/2006, 12/13/2006, 6/18/2009*, 9/17/2009, 9/21/2009, 9/22/2009, 9/23/2009, 9/25/2009, 10/5/2009, 10/6/2009, and 10/7/2009; and
o. Radiological data lab sheets for Nevada Gulch Well 11/10/2009, and Terry Peak 11/10/2009.

Some lab sheets, those marked with an '*', may be missing because they are reported from DENR samples. Please make note on the tables which samples are from the DENR. Lab sheets do not need to be provided for DENR samples.

Laboratory data sheets for the groundwater sites and dates noted are attached.

Appendix 7 Surface Water

1. Section 3.2 Results – This section indicates that Table 3-2 provides statistics which were done for all sites by parameter. This is not a proper way to analyze these streams as some streams may have previous impacts from mining or other activities and different geology from the source which may cause differences in the quality of water between drainages. For instance, Annie Creek drainage has impacts from the Reliance Waste Rock Depository while Lost Camp has no previous known impacts. Likewise, in False Bottom Creek, a difference in geology between two forks of the stream has caused a difference in pH because one fork of the creek flows over exposed Precambrian rock, dropping the pH, while the other fork of the creek does not. Therefore, any analysis performed on surface water should segregate the drainages to be analyzed individually rather than combined and should identify and note major differences in the water quality within an individual drainage and provide an explanation or discuss the difference.

   The statistics Table 3-2 provides a quick glance at surface water quality in the area. Statistical analysis of each surface water site was individually provided in tables of Appendix E. Surface water monitoring sites as part of the baseline characterization are grouped based on the major drainage system they are located on. These drainages and sites include:

   - Annie Creek (Annie Creek @ USGS, Lost Camp)
   - Deadwood Creek (DWD-1, BMT-1)
   - Nevada Gulch (SS-20, SS-04, and SS-05)
   - Fantail Creek (SS-14A, SS-06)
   - Stewart Gulch (SS-12, SS-01)

   Major differences in water quality within individual drainages can be analyzed by comparing the statistical analysis of monitoring sites within the same drainage. On Annie Creek, major differences between the overall water quality at the upstream Lost Camp site and the downstream Annie Creek @ USGS site is that the USGS site has twice the value of conductivity and total dissolved solids as the site on Lost Camp. Also, the median values of magnesium, sodium, sulfate, and nitrate were all slightly higher at the Annie Creek @ USGS site compared to the Lost Camp site. Differences between these two sites are likely the result of permitted NPDES discharges within upper Annie Creek/Ross drainages while the Lost Camp site is relatively unaffected by current mining

operations. Sites DWD-1 and BMT-1 are located in close proximity to one another on separate branches of the upper Deadwood Creek; the only notable difference between these sites is the median flow at DWD-1 is over twice that at BMT-1. From upstream to downstream, sites on Nevada Gulch include SS-20, SS-04, and SS-05. Differences in water quality along Nevada Gulch include increases of bicarbonate, hardness, sulfate, and total dissolved solids concentrations in the downstream direction. Both SS-20 and SS-4 are primarily upstream of mining at Golden Reward yet display these increases in TDS and sulfate; though the exact geochemical process taking place are not completely defined, it is possible that both historical mining and the highway along the creek have a small influence on water quality along the length of Nevada Gulch Creek. On Fantail Creek, sites SS-14A and SS-06 display fairly similar water chemistry. Water quality differences on Stewart Gulch sites SS-12 and SS-01 are also minor.

2. Section 3.3.1 and 3.3.2 – These sections provide a brief overview of all sample events that exceeded DENR criteria for the beneficial uses for the creeks. Please explain whether these occurrences happened during low flow or high flow events or after a meteorological event.

Within Section 3.3.1, two samples are described that exceed total suspended solids (TSS) criteria of 53 mg/L. One sample was collected in January 2010 At SS-20 with a TSS value of 99 mg/L; this occurrence happened during extremely low flow with a measured flow rate of just 0.14 gallons per minute (gpm). The sample collected at SS-12 in April 2010 with a value of 89 mg/L occurred during the beginning of spring runoff with a measured flow of 325 gpm at the time of sampling.

Section 3.3.2 details exceedences of beneficial use criteria that have occurred within the past 5 years. These occurrences are listed with regard to flow regime in the table below. Stream flow information was not available for the time of data collection for sites the exceeded zinc criteria. The second paragraph of Section 3.3.2 also incorrectly listed the TSS value for SS-12 as 233 mg/L when the correct value was 89 mg/L. Sites on Deadwood Creek and Nevada Gulch that were included in the text discussion about TSS are not included on this table as they did not exceed the TSS criteria for their designated beneficial use.

Site	Date	Constituent	Value	Flow	
Annie Creek	10/24/2007	field dissolved oxygen	3.82 mg/L	83.5 gpm	low to moderate
SS-12	08/05/2009	temperature	67.82 F (19.9 C)	21 gpm	low flow

SS-12	04/13/2010	TSS	89 mg/L	325 gpm	Likely snow melt runoff
SS-20	01/21/2010	TSS	99 mg/L	0.14 gpm	extremely low flow
DWD-1	01/06/2006	zinc	0.242 mg/L	not measured by likely low flow	
DWD-1	01/17/2008	zinc	0.142 mg/L	not measured by likely low flow	
BMT-1	05/23/2008	zinc	0.163 mg/L	not measured by likely moderate to high spring runoff flow	

3. Appendix C – Please ensure that the department has been provided with the most recently updated version of the sampling protocol.

   This information was provided with the revised groundwater characterization report but is also attached to this response.

4. Appendix D – Please provide all lab data sheets not previously provided in annual reports. Also, please ensure that any data from DENR samples are noted in the tables. If a sample was taken in conjunction with DENR then please ensure that both samples are presented within the tables and not averaged.

   All surface water data collected at Wharf through December 2010 and Golden Reward through September 2010 has been previously provided to the SD DENR in annual reports. Additional data collected for Golden Reward sites from October through December 2010 and all baseline surface water samples in 2011 are attached. Data analyzed in the baseline surface water characterization does not include any samples that were collected by the SD DENR.

5. Appendix D – Please review the data of these tables and verify that all data was recorded the same as was reported in the lab data sheets and that all field data is present.

   All field data recorded is present on the lab data sheets and the tables in Appendix D of the revised surface water report. Data on these tables were compared with lab data sheets. Errors found were primarily limited to reporting of significant digits and are corrected in the attached revised Appendix D tables. Also, additional data collected since the last reporting have been included in the tables.