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May 31, 2007

Via Certified Mail # 7002 1000 0005 6776 6610
Return Receipt Requested

Robert Casey, Manager
Water Quality Enforcement Unit
Arizona Department of Environmental Quality
1110 West Washington Street
Phoenix, Arizona 85007

**Re: Mitigation Order on Consent No. P-50-06,
Response to Comments on Identification of Potential
Interim Actions, Groundwater Monitoring Report, Well Inventory Report**

Dear Mr. Casey:

This letter is submitted in response to Arizona Department of Environmental Quality's (ADEQ) comment letter to Phelps Dodge Sierrita, Inc. (PDSI) dated March 12, 2007, on the Identification of Potential Interim Actions, Groundwater Monitoring Report, and Well Inventory Report submitted during December 2006.

Below, PDSI has reproduced ADEQ's comments from its March 12, 2007 letter, followed by PDSI's responses.

A. Identification of Potential Interim Actions Report

ADEQ General Comment:

"The report presents a list of interim actions or options that could be implemented to mitigate the effect of sulfate in excess of 250 mg/l in drinking water supplies. However, the report does not identify preferred or prescribed interim actions due to what was described as a "multiplicity of alternatives" and "site specific factors" that would be taken at a specific drinking water system(s), should monitoring show sulfate in excess of 250 mg/l.

The report identifies 10 drinking water wells that could potentially require future interim mitigation actions. Further, during the March 6, 2007 meeting, PDSI stated that because most of these drinking water wells are located in the middle towards the southern portion of the well field area, the likelihood of sulfate concentrations exceeding 250 mg/l at such wells is remote. Nevertheless, there are three or four drinking water wells located in northern portion of the well field area that are susceptible to high sulfate impacts. Given the availability of information, PDSI should provide more than a glimpse of how it will respond and implement interim actions to mitigate sulfate impact at drinking water supplies that exceed 250 mg/l. At a minimum, ADEQ recommends PDSI provides a flow chart describing

specific actions that will be taken, should sulfate concentration exceed 250 mg/l under any of the following three hypothetical scenarios presented in the report:

- 1. A private well (only one private well is identified on the list);*
- 2. A public water supply well feeding directly into the distribution system (Any of the 6 wells in this category can be used); and*
- 3. A public drinking water supply that is blended with other wells (ESP-1 is a good example).*

PDSI's Response:

Attached is a flow chart that illustrates the actions that PDSI would take depending upon the discrete sulfate concentration that is detected in each type of water supply well. If the sulfate concentration is less than 135 mg/L, PDSI will continue quarterly monitoring. If the sulfate concentration is greater than or equal to 135 mg/L, but less than 250 mg/L, PDSI will conduct an evaluation of site-specific conditions for the well, select an interim action, and develop an implementation plan for the selected action. PDSI will also begin monthly sampling of the well and evaluate the rate of increase in sulfate concentrations for purposes of determining when the selected interim action may need to be implemented. If the sulfate concentration exceeds 250 mg/L, PDSI would resample the well to confirm the initial sample result and determine whether the Phelps Dodge Sierrita Tailings Impoundment (PDSTI) is or is not the source. These actions would be followed by the immediate implementation of the selected interim action identified in the implementation plan prepared while sulfate concentrations are between 135 and 250 mg/L. As the flow chart indicates, the specific action that would be implemented depends upon the well type (e.g., private well versus public water supply well, and whether water from a public supply well is blended with water from other wells). Under the highly unlikely situation that sulfate concentration in a well suddenly exceeds 250 mg/L and an implementation plan has not been prepared, PDSI would immediately implement a first phase interim action, such as bottled water, point-of-use reverse osmosis (RO) treatment, or full house RO treatment. The first phase action would be followed by an evaluation of site-specific conditions and determination of whether to continue the first phase action or implement a second phase action until the Mitigation Plan is completed. In all cases, the implementation of an interim action would be followed by quarterly monitoring of sulfate concentrations for purposes of determining the "average" sulfate concentration, the parameter that would trigger cessation of the interim action.

ADEQ Specific Comment No. 1:

Section 2.2. p 11. paragraph 2

"According to Section 2.2 of the report, "interim action selection and planning will be triggered for a water supply with a discrete sulfate concentration between 135 and 250 mg/l, and interim action implementation will be triggered if the discrete sulfate concentration is 250 mg/l or greater." ADEQ also understands that PDSI will cease interim action implementation if, after implementing such interim action, the average sulfate concentration, which is the arithmetic mean of any subsequent three discrete sulfate results, is less than 250 mg/l."

PDSI's Response:

As was discussed in our March 6, 2007 meeting, ADEQ correctly understands the triggers proposed by PDSI for interim action selection, planning, implementation, and cessation. As described in Section 3 of the interim action report, the cessation criterion will be determined based on at least three quarters of follow-up monitoring.

ADEQ Specific Comment No. 2:

Section 5, p 11, paragraph 2

“Section 5 of the report raises the issue regarding how the source of the sulfate in any impacted drinking water supply well could affect the decision to implement interim mitigation measures by PDSI. Identifying the source of sulfate after a well is impacted could lead to a significant delay in the implementation of interim mitigation. In addition to PDSI, two other potential sources of sulfate in the area were identified as the Santa Cruz sediments and the Twin Buttes Mine. Although hydrodynamic and hydrochemical analyses can be helpful but not definitive in identify the sulfate source, sulfur isotope analysis may be the only definitive way to characterize the source of the sulfate. If PDSI suspects another source of sulfate may contaminate an identified drinking water well, PDSI should consider initiating such studies at the University of Arizona, or at any appropriate commercial laboratory in readiness for this potential event.”

PDSI's Response:

Given the quarterly groundwater monitoring and regional, semi-annual groundwater monitoring conducted to date, the current extent of the sulfate plume from the PDSTI is reasonably well defined in relation to the location of drinking water supply wells in the area. The first quarter 2007 groundwater monitoring results contained in the March 30, 2007 *First Quarter 2007, Groundwater Monitoring Report, Tasks 2.2 and 2.3 of Aquifer Characterization Plan, Mitigation Order on Consent Docket No. P-50-06, Pima County, Arizona*, demonstrate that the sulfate plume extends northward to the vicinity of Duval Mine Road. In addition, as was discussed in the *Work Plan to Characterize and Mitigate Sulfate with Respect to Drinking Water Supplies in the Vicinity of the Phelps Dodge Sierrita Tailing Impoundment, Pima County, Arizona (Work Plan)*, groundwater within the plume has a different chemistry than groundwater upgradient and downgradient of the plume. For these reasons, PDSI is confident that hydrogeologic flow path analysis and hydrogeochemical analysis of water quality can be used to demonstrate whether the PDSTI is or is not the likely sulfate source. If, in the future, it is determined that additional studies are needed to determine whether the PDSTI is the sulfate source, PDSI will consider the use of sulfur isotope analysis. Given that PDSI is conducting quarterly monitoring to track plume migration and has proposed to conduct monthly monitoring if the sulfate concentration equals or exceeds 135 mg/L at a drinking water supply well, as illustrated in the attached flow chart, sufficient time is available to initiate source identification studies, like those referenced by ADEQ.

B. Groundwater Monitoring Report

ADEQ General Comment:

“The scope of the groundwater monitoring report is consistent with the approved work plan. ADEQ agrees with PDSI’s conclusion that compared with the September 2006 data, there are “no substantive differences in the plume configuration.” ADEQ requests that PDSI also provide the groundwater monitoring report and data in electronic format to facilitate easier evaluation and comparison of future data.”

PDSI’s Response:

Starting with the second quarter 2007 groundwater monitoring report, that will be submitted by June 30, 2007, PDSI will provide a complete copy of each quarterly groundwater monitoring report in electronic format (i.e., .pdf) and spreadsheets containing Tables 1, 2 and 3 in electronic format (i.e., .xls).

ADEQ Specific Comment:

Section 1.1.1, p. 2, paragraph 3:

“Many of the wells scheduled for quarterly sampling could not be sampled due to access related issues. Despite PDSI’s assurances during the March 6, 2007 meeting that the unsampled wells did not create data gaps, ADEQ recommends that all necessary steps should be taken to ensure that all wells are sampled. Wells such as CW-8 are crucial in defining accurately the plume’s configuration.”

PDSI’s Response:

As was stated in PDSI’s October 30, 2006 responses to ADEQ’s comments on the Work Plan, “Although PDSI agreed to the revised schedule, it is important for ADEQ to understand that both the groundwater monitoring task and the offsite well installation task have potential lead time issues for negotiation of access to private property.... PDSI will make all efforts to expedite access and permits including seeking assistance from interested parties and agencies, but we cannot make guarantees on matters that are out of our hands.” (see response to Page 3 of 8, General Comments, F. Schedule).

PDSI made every effort to obtain access to the wells scheduled for quarterly sampling during the fourth quarter 2006. However, as was indicated in Table 1 of the December 29, 2006 *Groundwater Monitoring Report, Fourth Quarter 2006, Tasks 2.2 and 2.3 of Aquifer Characterization Plan, Mitigation Order on Consent Docket No. P-50-06, Pima County, Arizona*, access negotiations could not be completed in time to sample several wells. This did not create any significant data gaps. These wells were either sampled or samples were collected from nearby wells during the first quarter 2007 groundwater sampling round.

ADEQ Specific Comment No. 1:

Section 2.2, p. 5, paragraph 1:

“The results presented in Table 4 for ESP-4 and MH-12 are only for depth specific samples. There are no results for representative samples of the whole well. However, an evaluation of the sulfate

isoconcentration lines in Figure 1 shows the values for these wells area extrapolated as 500 and 1400 ug/L respectively. The isoconcentration values are not consistent with the depth specific data or their averages. In future, depth specific sample results should be accompanied by the collection and analysis of a representative sample of the whole well.”

PDSI's Response:

As is discussed in the Work Plan, depth-specific sampling was proposed for selected wells (i.e., ESP-1, ESP-2, ESP-3, ESP-4, CW-7, CW-8, MH-11, and MH-12) to meet a specific objective: identify water quality variations with depth. PDSI does not see the need to collect and analyze samples representative of the whole well at the same time that depth-specific sampling is conducted because whole-well samples are collected from all of the wells planned for depth-specific sampling as part of the quarterly groundwater monitoring program.

The isoconcentration contours for sulfate in the vicinity of ESP-4 and MH-12 were extrapolated based on the highest sulfate concentration measured in the depth-specific samples at those locations. While this approach would overestimate the average sulfate concentration at a well, such as ESP-4, in which there was a large variation of sulfate concentrations with depth, it is conservative in that the extent of sulfate is not underestimated. Note that the contouring presented in Figure 1 was not entirely based on a linear extrapolation between wells to avoid over-exaggeration of some of the contour lines.

Additionally, we assume that ADEQ meant milligrams per liter in their comment rather than micrograms per liter when describing the extrapolated sulfate concentrations for ESP-4 and MH-12.

ADEQ Specific Comment No. 2:

Section 3, p. 7, Discussion:

“The report states that the results of depth specific sampling at ESP-4 indicate that sulfate concentrations increase significantly below a depth of 750 ft, while well MH-12 did not show a similar trend with depth. This interpretation did not consider the fact that MH-12 was sampled only to a depth of 700 ft. During the March 6, 2007 meeting, PDSI explained that an obstruction was present at 700 feet limiting drill depth. It is most probable that if deeper samples were obtained at MH-12, a similar stratification as in Well ESP-4, which was sampled to a depth of 950 feet, could exist. For future comparable analysis, well depths for this type of study should be comparable. If not possible, an explanation should be provided the appropriate context or basis for any conclusion reached.”

PDSI's Response:

The report simply stated the trends identified by the data. No attempt was made to infer or extrapolate potential changes in groundwater quality below a depth of 700 feet in MH-12 because PDSI was unable to collect deeper samples. To the extent that future depth specific sampling results are reported for wells of different depths, PDSI will discuss how any differences in sampling depths affect the interpretation of depth specific sampling results. Although we concur that “a similar stratification as in Well ESP-4” might exist below a depth of 700 feet, we cannot support ADEQ's inference that it is “most probable” because there is no information to confirm the speculation.

C. Well Inventory Report

C. Well Inventory Report

ADEQ General Comment:

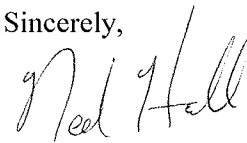
“The Well Inventory Report was prepared in accordance with the approved Work Plan. The principal objective of the report was to identify and sample all drinking water sources within one mile radius of the 250 mg/l sulfate plume boundary. The well search, screening processes, and safety checks were thorough and well implemented. Since the plume boundary is dynamic it may be necessary to update the report in the near future.”

PDSI’s Response:

Groundwater monitoring conducted through the first quarter of 2007 indicates no substantive difference in the location of the plume, as defined by the 250 mg/L contour, as compared to the early 2006 location illustrated in the Work Plan. Thus, ADEQ’s concern that the report may need to be updated in the near future because the “plume boundary is dynamic” may be unfounded. Regardless, as was stated in Section 3.2 of the Work Plan, “The well inventory may be revised if the plume defined by the results of characterization work for Task 2 indicates a significantly different shape for the plume.” If this situation arises, PDSI will update the report by issuing an addendum.

If you have any questions regarding these responses, please contact me at (520) 648-8857 or PDSI’s project manager Mr. Stuart Brown at (503) 675-5252.

Sincerely,

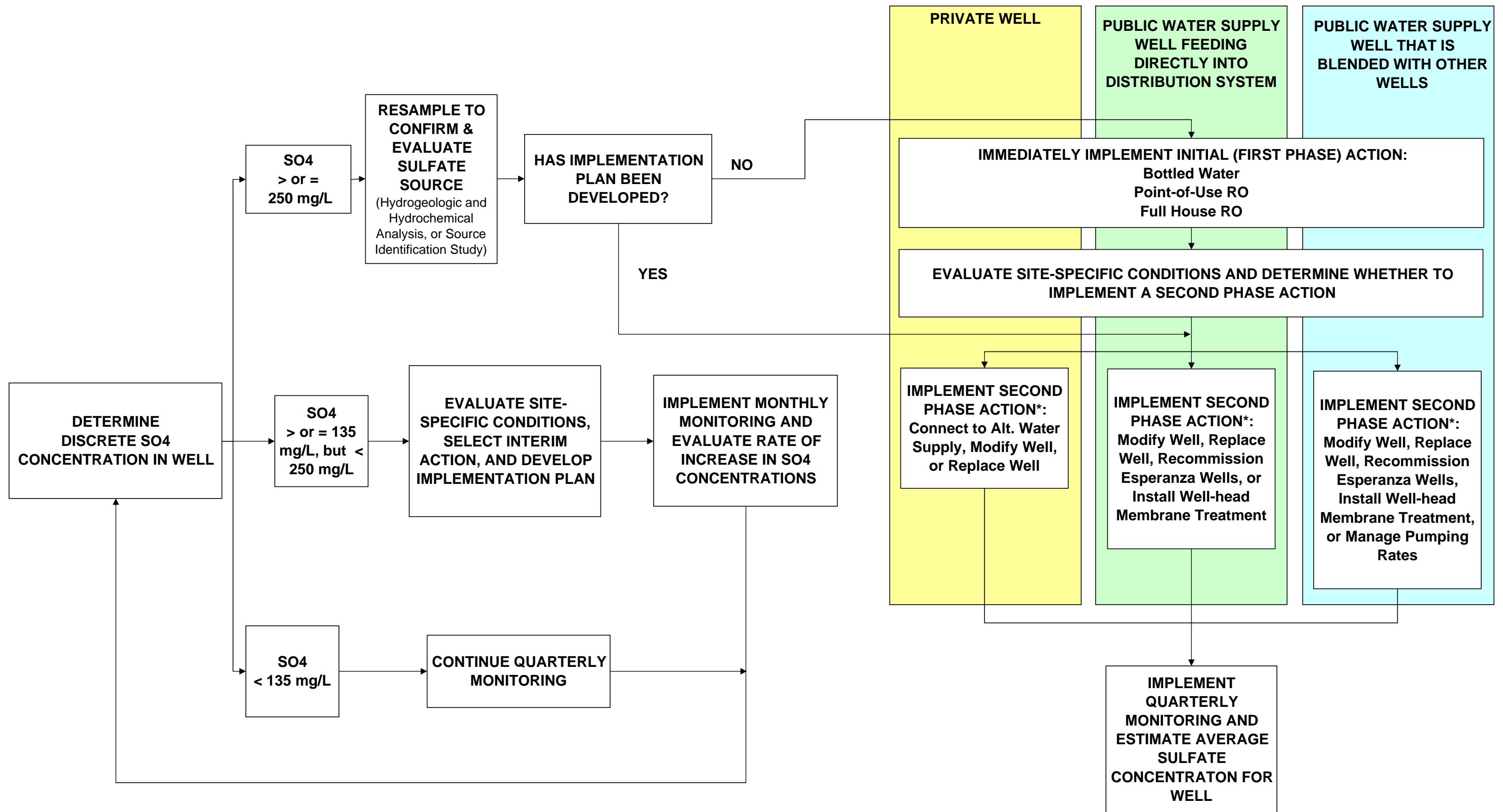


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FLOW CHART ILLUSTRATING INTERIM ACTION EVALUATION AND IMPLEMENTATION ACTIONS FOR EACH WELL TYPE



*Note: Second Phase Action Could Include Continued Use of Bottled Water, Point-of-Use RO, or Full House RO