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Scott Davis
Director
Department: Environmental Policy and Programs

Tel. 602-250-3225
Fax 602-250-3872
e-mail: Scott.Davis@aps.com

Mail Station 8376
PO Box 53999
Phoenix, Arizona 85072-3999

Via Email: jce@azdeq.gov
Certified Mail: 7006 3450 0003 7331 6284
Return Receipt Requested

September 7, 2010

Jennifer C. Thies
Remedial Projects Unit
Arizona Department of Environmental Quality
WQARF Unit Manager - 4415B-1
1110 West Washington Street
Phoenix, AZ 85007

Subject: West Van Buren Water Quality Assurance Revolving Fund (WQARF) Site
Roosevelt Irrigation District Well Investigation Work Plan

Dear Ms. Thies:

Arizona Public Service appreciates the opportunity to provide comments on the Roosevelt Irrigation District (RID) Well Investigation Work Plan (Work Plan) prepared by Montgomery & Associates, dated August 9, 2010. The Work Plan was submitted to the Arizona Department of Environmental Quality (ADEQ) in response to the requirements imposed by the Agency in the conditional approval of RID's February 3, 2010 Early Response Action (ERA) Work Plan. Set forth below are APS' comments on the RID Work Plan.

APS General Comment 1.
The conditional approval of the ERA by ADEQ on June 24, 2010, required RID to complete an investigation of the RID wells. This condition was included because of the concern related to the proposed increased pumping rate at RID wells to be used for the remediation.

> "Due to the proposed increased pumping rate at RID wells to be used for remediation, RID must conduct well testing and modeling to insure that changes in pumping will not adversely affect groundwater quality and levels within the WVBA beyond what would be expected with the current pumping conditions. Water levels must be maintained at or near current levels taking into account natural variations. The investigation must determine how ERA workplan implementation will affect both the aquifer and wells in the area of the plume."

The ADEQ request specifically indicated that "Within 45 days of ERA approval, RID shall submit a well investigation work plan for the investigation of RID wells within the plume boundary." The Work Plan that has been presented by RID to meet this condition only proposes performing investigation on selected wells within the plume boundary. The Work Plan is not adequate to evaluate if the proposed RID ERA can control and contain contamination at a level that will reduce the scope or cost of the remedy needed at this Site as required under A.A.C. R18-16-405(A) (B).

The cornerstone of the Roosevelt Irrigation District (RID) Early Response Action (ERA) is the conversion of existing RID irrigation wells to remedial groundwater extraction wells. Because these wells are being converted from irrigation supply wells, it is critical to understand the flow conditions and integrity of the wells prior to being included as a key part of the remedial system.

Based on the information provided in Table 2 of the Work Plan, the average age of the RID wells in the West Van Buren Area (WVBA) Site is 55 years, with selected wells in the proposed remedy being over 70 years old. The wells are likely near the anticipated life expectancy and conservatively assuming a remedial pumping time of over 50 years without source control, the majority of the RID wells will be over 100 years old prior to completion of remedial activities.

When the RID wells were installed as irrigation supply sources, there was little regard to screen intervals selection and the wells likely have very long screened intervals. Further, lithologic information such as detailed drill cutting logs and geophysical logs are not available. Due to the variable conditions of the aquifer units across the WVBA Site, it will be important to understand the flow profile and contaminant distribution in <u>all</u> of the wells within the plume boundary.

The general process for evaluating the individual wells provided in the Work Plan is sound, but the RID Work Plan does not meet the requirements of the ADEQ conditional approval letter and should not be approved by ADEQ. The Work Plan should be expanded to include all of the RID wells located inside the plume. The scope of the Work Plan should provide for a comprehensive investigation of the wells for an adequate evaluation of the use of these wells in the Feasibility Study (FS).

APS Specific Comment 1 – Video Surveys

Page 9, Section 4.3 The Work Plan details that videos will be performed on selected wells presented in Table 1. Because of the age of the wells, it is recommended that the well videos be performed on all wells within the plume boundary as a three (3) step process. The first step would be an initial video to observe the overall condition of the well and the degree of encrustation and debris in the well. The second step would include mechanical brushing of the well to remove debris and screen surface material,

and the third step would be to perform a second video survey. The evaluation should include a comparison of the well condition before and after brushing activities.

APS Specific Content 2 – Sand Content Monitoring
Page 10, Section 4.4.1, the Work Plan states that prior to conducting fluid movement investigations at each well, the test pumping equipment will operated at the design flow rate for a minimum of 3 days. During this time, the well discharge should be monitored for sand content and turbidity.

APS Specific Comment 3 - Well Integrity
On Page 9, Section 4.3 , the Work Plan indicates that notes will be made regarding well integrity. Given the advanced age of the wells, a process and plan should be detailed on how the wells will be evaluated for well integrity and a work flow of how further evaluation and testing (e.g., wall thickness testing) will be conducted to understand the efficacy of using the well as part of the remedial design.

APS Specific Comment 4 - Flow Testing
On Page 11, Section 4.4.2, the Work Plan details activities for collecting depth-specific water sampling. APS agrees that the flow testing and depth specific water quality information will provide valuable information for understanding the nature and extent of water quality in the WVBA Site. However, based on Table 3 of the Work Plan, it appears that only limited depth specific sampling may be performed based on unclear contingencies. It is recommended that the depth-specific sampling be expanded to all wells listed on Table 3 with a minimum of at least one sample collected in each screened aquifer unit per well. In addition, the Work Plan indicates that "the depths for sampling will be selected in the field based on the results of the geophysical logs obtained previously". The rationale and process for how the geophysical information will be evaluated and how sample depths will be selected should be included in the Work Plan. The Work Plan indicates that the work will adhere to protocols developed by ADEQ in the WVBA Field Sampling and Analysis Plan (FSAP) and Quality Assurance Project Plan (QAPP). The specific sections of the FSAP and QAPP should be referenced for the depth specific sampling protocol, and the analytical details for the water sampling (i.e., test method, detection limit, reporting limit, etc.) should be included.

APS Specific Comment 5 - Well Modification
Page 12, Section 5.0, the Work Plan discusses possible well modifications. A work flow should be presented on how the evaluation will be performed to address expected well conditions (screened interval, poor seal conditions, sand production, poor screen conditions) and the process that will be undertaken to complete the well modifications.

As provided previously, APS believes the RID ERA does not address the sources of contamination as required under A.A.C. R18-16-405(A). The varying ratios of VOCs throughout WVB VOC plume indicate the heterogeneity of the VOC concentrations due

to multiple source areas. The presence of individual source areas within WVB would favor an approach of individual source control combined with a regional hydraulic control for the diffuse plume. VOC mass removal and source control is most effective when the pumping is performed proximate to the source. The locations of the RID wells are not optimized to source area locations, increasing the potential for the RID wells to mobilize contaminants away from source areas. Not implementing source control and allowing higher concentrations to be pulled to RID wells will further disperse the contaminants, both laterally and vertically throughout the aquifers and prolong the time needed to operate the final remedy.

The RID Work Plan does not meet the requirements of the ADEQ conditional approval letter and should not be approved by ADEQ. APS appreciates the opportunity to provide these comments to ADEQ. If you have any questions regarding these comments, please contact Judy Heywood at 602-250-3850.

Sincerely,

Scott Davis
Director, Environmental Policy and Programs
Arizona Public Service Company

cc: Benjamin H. Grumbles, ADEQ Director (via email - bhg@azdeq.gov)
Henry R. Darwin, ADEQ Assistant Director (via email – hrd@azdeq.gov)
Amanda Stone, ADEQ Director, Office of Waste Programs (via email – as3@azdeq.gov)
Julie J. Riemenschneider, ADEQ Remedial Projects Section, Manager (via email - jjr@azdeq.gov)
Judy Heywood, APS Remedial Project Manager (via email – Judith.heywood@aps.com)
Ken Miller, APS Law Department (via email – kennth.miller@aps.com)
Molly Cagle, Vinson & Elkins (via email - mcagle@velaw.com)