SYNERGY ENVIRONMENTAL, LLC

September 20, 2011

Via U.S. Mail and Electronic Mail

Ms. Jennifer E. Thies
Manager, Remedial Projects Unit
ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY
1110 West Washington Street
Phoenix, Arizona 85007

Re: Response to ADEQ Letter Dated September 2, 2011 - "Review of RID-95 Wellhead Pilot Treatment System Proposal Work Plan"

Dear Ms. Thies:

On behalf of the Roosevelt Irrigation District (RID), Synergy Environmental is submitting this response to ADEQ's comments included in your letter dated September 2, 2011 - Review of RID-95 Wellhead Pilot Treatment System Proposal Work Plan. We are pleased ADEQ reviewed and concurred with the implementation of the work described in the RID-95 Wellhead Pilot Treatment System Proposal (RID Proposal) dated August 18, 2011. We look forward to working with you and ADEQ on implementing the RID Proposal to commence and evaluate wellhead treatment, in the near-term, at four (4) of the most highly contaminated RID wells.

For convenience, the RID responses to the ADEQ comments are provided consistent with the listing set forth in the September 2, 2011 letter with the summary of ADEQ comments recapped in italics followed by the RID responses.

"General Comments"

The work plan should have a signature page including a registered professional's signature and stamp and author's signature.

The RID Proposal was drafted and submitted to ADEQ as a conceptual summary and not a detailed work plan. The subsequent detailed work planning documents, most notably the detailed engineering design and the operations and maintenance (O&M) plan, will be developed in cooperation with ADEQ and submitted to ADEQ for approval as signed and stamped documents by a registered Professional Engineer.

The work plan should indicate that all construction activities and specifications will be in accordance with the Uniform Building Code (UBC) and all applicable state and local codes and regulations ... (and that) ... all necessary permits/approvals must be obtained.

Detailed design specifications will conform to all applicable standards and guidelines, including the UBC and the Maricopa Association of Governments (MAG) standards, and RID will comply with all applicable codes and regulations and obtain all necessary permits.

"Specific Comments"

1. *Section 2 - Other compounds may be present (e.g., vinyl chloride, chromium and MTBE) that would effect the carbon treatment and should be discussed and addressed.*

These wellhead treatment systems will be connected to four (4) RID groundwater extraction wells that have been well characterized over the past several years. The full suite of analytes included in EPA Method 8260B, including vinyl chloride, chloroform, MTBE and many other contaminants (71 volatile organic analytes), has shown that vinyl chloride and MTBE are non-detectable at these wells and chloroform, while present in very low concentrations (typically 1-3 micrograms per liter (μg/L)), does not adsorb well on GAC and is not expected to effect carbon life.

Similarly, chromium has been detected only locally in the WVBA, impacting wells RID-102 and RID-105 at levels of 21 μg/L and 12 μg/L, respectively (2008, Draft RI Report), and has not been detected at the four (4) wells being equipped with treatment.

The treatment objectives of this initiative are focused on removing those VOCs that exceed current MCLs. Accordingly, RID did not propose analyzing for compounds known to be absent or present in concentrations that are below those standards. However, RID is certainly willing to discuss this matter with ADEQ in more detail in order to reach a mutually agreed upon set of analytical compounds that will subsequently be included in the O&M Plan.

2. *Section 2.5 - ADEQ recommends the use of bag or sock filters prior to the granular activated carbon (GAC) canisters to reduce/prevent fouling of the GAC canisters by suspended solids and reducing/eliminating the need to backwash.*

Since these treatment systems will be connected directly to groundwater extraction well discharge piping, it is unlikely that prefiltration will be required since suspended solids in groundwater is typically quite low. Review of similar wellhead GAC treatment systems in the valley confirm that particulate fouling is not a common problem and backwashing is rarely required.

While prefiltration was discussed and planned in the ERA (Appendix A), the source of water feeding the ERA centralized treatment facility flows through the Salt Canal which is known to be a source of sediment (sand, silt, clay and organic materials) that would require removal to sustain reliable and efficient operation of the GAC vessels. This is not the case with the wellhead treatment approach.

However, one of the purposes of the pilot evaluation is to confirm this design assumption. As stated in Section 2.3 of the RID Proposal, "Pilot testing will enable assessment of ... variations in water quality (e.g., pH and hardness) and physical properties such as the presence of suspended solids (e.g., sand, silt, and clay)." Prefiltration will be added to individual wellhead treatment systems if, during the course of the evaluation, it is determined to be necessary.

3. Figure 1 is very difficult to read and a larger figure should be provided.

Figure 1 was provided as a conceptual site plan only. Full size engineering drawings will be provided to ADEQ during the course of the detailed design process. In addition, and as discussed in more detail below, ADEQ will be provided preliminary drawings for review and comment during each stage of design development, as well as a set of signed and stamped final drawings.

4. Section 3 - Design detail should be included in the work plan. Specifically:

Submitting the design details when the system is 90% complete does not allow ADEQ to conduct a thorough review.

RID intends to maintain an open process in the development of the detailed designs of these four (4) wellhead treatment systems. In light of the rapid pace at which this will proceed, ADEQ will be invited to design team meetings and be provided hard copies of design drawings and equipment specifications (as requested) throughout the process. ADEQ also will be provided the 90% design package for formal review and comment, as stated in the RID Proposal.

Design details should discuss pressure available at the RID well and whether booster pumps are needed.

Well pump pressures and treatment system head losses are being reviewed and will be part of the detailed engineering design process that will formally commence in the coming weeks. The preferred approach to overcome the additional head loss to maintain well production capacity will be determined during this design process.

Design details should also discuss the proposed duration of the pilot treatment test.

The pilot-testing part of the RID Proposal is anticipated to last between 9 and 18 months, depending on the rate of GAC saturation (time to regeneration). The pilot test will begin with 2 vessels (1 lead, 1 lag) charged with virgin coal-based GAC and the other 2 vessels with virgin coconut shell-based GAC. The testing proceeds as follows:

- after a period of X months, the lead vessel becomes saturated and is replaced with regenerated GAC, the lag vessel now becomes the lead.
- after a period of Y months, the new lead vessel becomes saturated and is replaced with regenerated GAC, the lag vessel (now containing regenerated GAC) becomes the lead vessel.
- after a period of Z months, the lead vessel containing the regenerated GAC becomes saturated and is replaced with regenerated GAC.

It is reasonable that time periods X, Y and Z will be in the range of 3 to 6 months. Therefore, in order to evaluate the performance of virgin and regenerated GAC in both carbon varieties, it is projected that the pilot test could run between 9 and 18 months.

5. *Section 4.2, Table - Effluent port sampling should be weekly until stability in contaminant concentrations can be demonstrated.*

Effluent port sampling and analysis will be conducted on a weekly basis from system start-up until stability in contaminant concentrations is demonstrated. RID will work with ADEQ to establish the details of this stability determination and those specific criteria will be included in the O&M Plan to be developed and submitted to ADEQ for review and approval.

6. *Section 5, Sixth Bullet - Operational data should be reviewed on a monthly basis.*

RID will provide ADEQ with a summary of operational performance data on a monthly basis. Analytical results for sampling conducted during the last part of each month will be provided in the following monthly data submittal to ADEQ due to laboratory analysis turn-around-times. These provisions will be included in the O&M Plan.

7. *Section 7.1 - The near-term assessment period should be one month.*

RID concurs with the near-term assessment period of one month.

8. *Section 9 - ADEQ suggests that RID ensure that the installation of the well head treatment systems not interfere with RID's ability to conduct the well investigations as approved by ADEQ.*

The configuration of the treatment facilities and associated appurtenances will be designed and constructed to provide sufficient space and clearance around the well to conduct routine maintenance on the pumps and motors and to conduct well investigations as approved by ADEQ.

Again, we appreciate ADEQ's timely review of RID's Proposal and ADEQ's concurrence with the implementation of RID's Proposal. As discussed herein, RID will begin incorporating ADEQ's comments into the detailed engineering design as it proceeds, as well as into the development of the draft O&M Plan. RID also commits to pump the four (4) wells associated with the wellhead treatment systems at rates consistent with historic pumping levels at each well until the required analyses of Tasks 2 and 3 have been conducted and the results discussed with ADEQ. RID looks forward to meeting with you and your staff in connection with the implementation of these wellhead treatment systems.

Best Regards,

SYNERGY Environmental, LLC

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