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From: Karen Gaylord <KSG@jhc-law.com>
Sent: Wednesday, January 14, 2015 12:58 PM
To: Tina LePage
Cc: Danielle R. Taber; Laura L. Malone; Scott R. Green
Subject: RID FS - Resubmittal of November Working Group comments
Attachments: 2014-11-07 final cnslidtd cmmts RID FS (scrubbed).pdf

We are re-submitting the attached Working Group comments for the record during the currently-open comment period. Hard copies will be delivered to you all today.

Thank you.

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1. There are no current risks to public health that need to be addressed by Roosevelt Irrigation District (RID's) proposed draft West Van Buren Area (WVBA) remedy. RID's often-repeated references to "imminent and substantial endangerment" in WVBA are unsupported by the record and misleading.

Like RID's proposed remedy, the cover of RID's July 2014 Draft Feasibility Study (FS) Report attempts to paint a picture of "imminent and substantial endangerment" to the public where no such risks exist. In the top photograph of the cover, a pipe is shown discharging groundwater from an irrigation supply well directly into RID's canal, with a view of children playing outside a school in the background. The bottom photograph depicts an RID water treatment system. The juxtaposition of these photos gives the false impression that RID's proposed remedy is necessary to protect public health and safeguard our most vulnerable residents.

The truth is that there are no groundwater-related risks to the children playing at the school in the cover photo. The photograph was taken at Well RID-86, near 63rd Avenue and Durango. That well is located well outside of the West Van Buren contamination plume. Furthermore, based on RID's own chemical test results, groundwater being discharged into the canal from Well RID-86 contains no measurable Contaminants of Concern (COCs). As illustrated in the photograph shown below, there are no treatment systems at Well RID-86. The treatment system depicted on the cover of RID's Report is not at Well RID-86 but is actually located at Well RID-114 at 23rd Avenue and Van Buren Street, which is over five miles from Well RID-86. There is no adjacent open canal and no school located near Well RID-114.

Well RID-86 and RID Canal, near S. 63rd Avenue and W. Durango Street, looking south photographed by Ronnie Hawks 9-26-14
Western Valley Elementary School in background

Just as there are no groundwater-related health risks to children playing near Well RID-86, there are no risks to children playing anywhere or to the public at large from RID's irrigation groundwater pumping. The persistent references to health risks and unfounded claims of substantial endangerment that appear throughout the RID Draft FS Report seem to be designed to make the case for immediate treatment of groundwater to further RID's ultimate goal of obtaining treated groundwater to sell to West Valley potable water providers.

RID's own screening level health assessment showed that there are no acute health risks associated with potential public exposures to the WVBA Site contamination. Contrary to the mandate set forth in Arizona Department of Environmental Quality (ADEQ's) June 24, 2010 conditional approval of the earlier RID Early Response Action (ERA), RID never conducted a quantitative risk assessment. Yet RID evaluated and developed its remedial alternatives based on the assumed existence of an imminent and substantial endangerment. Without having a scientific basis to support its evaluation, RID simply concluded that each

remedial alternative will "reduce the risk of imminent and substantial endangerment to public health and welfare…"

There is no dispute that water in RID's canals is safe for all current uses. A 2001 study by ADEQ provides that Volatile Organic Compound (VOC) levels in RID canal water were "substantially lower" than VOCs in groundwater and that the VOC levels in canal water rapidly decreased short distances from well discharge points.[1] In June 2011, RID collected water quality samples from impacted RID well discharges and points within the Salt Canal, from the open lateral serving Well RID-92, and from the Main Canal.[2] RID analyzed those samples for VOCs and compared its laboratory results to Arizona Surface Water Quality Standards (SWQSs).[3] RID concluded: "Data obtained by sampling and analysis of COCs in the RID-92 and RID-114 water supply systems document the occurrence of COCs at levels *safely below* numeric limits established for Arizona SWQSs that are believed to have an adverse health effect from dermal exposure by partial- and full body contact during bathing and swimming in the open RID laterals and canals as well as ingestion of fish caught in these waterways."[4]

The Working Group's and RID's own analyses confirm the suitability and safety of RID canal water for current uses. Based on the reported maximum concentrations in surface water samples collected from RID's open canal segments between 2009 and 2013, each COC was detected at concentrations that are below SWQSs for fish consumption, full-body contact, partial-body contact, aquatic and wildlife uses (effluent-dependent water), agricultural irrigation, and agricultural livestock watering.[5] In sum, statistically significant water quality data sets collected for more than a decade serve as confirmation that RID's canal waters are safe for current uses, including full body contact and fish consumption.

RID also determined that COCs released to the air from its system operations do not exceed risk screening levels. In 2011, RID collected "limited scope" air samples "to facilitate a preliminary assessment of the potential risk to the public health from inhalation of COCs released to the air from RID water

[1] Draft Feasibility Study Report, at 61-62 (Synergy, July 2014) ("RID Draft FS").
[2] *Id.* at 62-63.
[3] *See* A.A.C. § R18-11-109.
[4] Public Health Exposure Assessment and Mitigation Summary Report (Synergy, 2011c) (September 16, 2011) (emphasis added).
[5] Working Group FS, Appendix D, p. 38.

supply system operations in the WVBA Site."[6] RID reported that there were no current risks: "The findings indicate concentrations of target COCs in ambient air are less than screening-level guidelines for acute and sub-acute exposures developed by the ADHS and ATSDR. It is reasonable to conclude that the current air emissions from RID water supply well discharges and water supply conveyance do not pose an acute risk to public health."[7]

Because concentrations of COCs in groundwater continue to decrease, concentrations of COCs released to the air by RID also continue to decrease. As reported in RID's Long Term Operational Assessment Report (Synergy Environmental, April 2013), ambient air samples were collected during by-pass operations at each of RID's treatment plants to evaluate the effectiveness of fugitive emissions control measures. No VOCs were detected outside any of RID's well or treatment enclosures (Synergy Environmental, 2013 at p. 14). Without having any detectable VOCs, there is no exposure, and thus no risk. With no risk, there is no reasonable justification for spending what RID has estimated would be approximately $51,000,000 to treat extracted groundwater.

Despite the overwhelming evidence that RID's operation of its system poses no health risks, RID still claimed in its FS that an imminent risk to public health exists. Yet RID never conducted a quantitative risk assessment to validate its claim or to assess whether or not RID's operations present "potential long-term, chronic risks to public health or welfare from releases of hazardous substances."[8] If RID truly believed that such risks exist, it should have conducted a quantitative risk assessment rather than continue to claim that risks exist with no basis.

To justify its failure to conduct a Human Health Risk Assessment (HHRA), RID argued that "there is no basis to interpret" these risks. RID fails to recognize that the purpose of a HHRA is to quantify and interpret those risks. As a result, RID defaults to conducting only a "screening-level comparative analysis of each remedy's ability to mitigate risk to public health, welfare, and the environment prospectively." The Working Group believes that it is improper for RID to conduct

[6] RID Draft FS, at 65.
[7] *Id.* at 66.
[8] Regardless of whether or not WQARF required RID to conduct a quantitative risk assessment, RID should have conducted one to support the primary basis for its proposed remedy.

a risk screen that shows no risks, then assert that risks do exist in order to propose a remedial action to mitigate those nonexistent risks. Unlike RID, the Working Group conducted a comprehensive HHRA consistent with federal guidelines. The results of the Working Group's HHRA demonstrate that there are no health risks.[9] The calculated health risks, based on "intake values" for ingestion of surface water or fish, dermal contact with surface water or RID well groundwater, and inhalation of ambient air, demonstrate that RID's canal water is safe. A brief summary of those results are shown below:

Exposure Scenario	Carcinogenic Risk	Hazard Index
RID Worker	4×10^{-7}	<1.0
Resident	8×10^{-7}	<1.0

These risk levels are considerably below (i.e. better than) the acceptable risk range of 1×10^{-4} to 1×10^{-6} for carcinogenic risk and a Hazard Index of 1.0 for noncarcinogenic risk.[10]

All available data confirm that groundwater transported through RID's system from RID wells is fit for its current use without treatment. There is no imminent and substantial endangerment to public health or welfare. RID's claims to the contrary lack any basis in science or fact.

2. RID provides no basis for its statement that its proposed remedy reduces or addresses current risks as provided in Water Quality Assurance Revolving Fund (WQARF) rules.

Throughout RID's Draft FS Report, RID repeatedly refers to risks to the public that must be reduced. For instance, in describing its proposed remedy, RID states, "Consequently, the small mass of VOCs that are not removed by direct remedial measures will pose a reduced risk to the public."[11] But as explained above, there are no current risks to public health.

[9] Working Group FS, Appendix D.
[10] *Id.*, Appendix D, p. 37.
[11] RID Draft FS, at 189.

Because no health risks exist, current treatment is not necessary to treat COCs. RID's proposed remedy therefore is not reasonable or necessary to reduce any current risks. The issue for regulatory determination is what current or contingent actions can or should be taken to address protection of existing or future potable water-provider wells. Currently, RID wells are not impaired because the discharged groundwater meets risk-based standards for its current irrigation use. Uncertain future changes in RID's use of groundwater are appropriately addressed in the future, if and when those changes occur. By that time, continued reductions in VOC concentrations in the WVBA, combined with blending in the RID canal system, may be sufficient to alleviate the need for any treatment to address that future use. But as long as RID pumps groundwater solely for irrigation use, it can deliver that water without the need for any treatment of the COCs. Absent any current risks or need for treatment with regard to current uses, RID's proposed remedy cannot be justified.

3. Contrary to RID assertions, groundwater in the WVBA is suitable for its current irrigation use without treatment.

RID purports to have evaluated its proposed remedial alternative with regard to protecting "current and reasonably foreseeable water end uses" as defined in the WVBA Site Remedial Objectives (RO) Report.[12] This is incorrect in two respects. First, as discussed in comments below, RID fails to consider the ROs of other water providers including the objectives of Salt River Project (SRP) and the City of Phoenix to preserve groundwater supplies in the WVBA for future use.

Second, in its review of its own objectives, RID has described its own wells as being "not suitable for current or reasonably foreseeable water end uses without treatment…."[13] However, groundwater produced from RID's irrigation wells is suitable for current end uses without treatment. Most of the RID wells along the Main Canal are not impacted by COCs. Furthermore, RID has not proposed plans for treatment of groundwater extracted from wells located in that part of its system. Even with regard to the RID wells that have been fitted with treatment systems, RID apparently believes that those wells are suitable for current uses without treatment because it operated each of the four liquid granular activated carbon (LGAC) pilot treatment plants in bypass mode (i.e. the

[12] RID Draft FS, at 166.
[13] *Id.* at 167.

groundwater from each of those wells was provided for direct end use without treatment) from August 6 through September 2013 during the 2013 pumping season.[14] Upon resumption of operations during the 2014 pumping season, RID operated the systems to or past the point of breakthrough in May of 2014, discharging partially treated water. RID again operated all four systems in bypass mode, providing water for direct use without treatment, from May 2014 through September 2014.[15]

4. RID's proposed remedy does not achieve the Remedial Objectives established by ADEQ for other regional water providers.

RID's FS only evaluated remedial alternatives for which RID thought it had the "authority and access to implement the remedy,"[16] rather than conducting a FS to determine the most appropriate approaches for achieving ADEQ's selected WVBA ROs. In other words, RID's limited remedy evaluation focused on RID's goals for its own wells, not ADEQ's goals for the WVBA. As a result, RID's proposed remedy fails to address foreseeable uses of the City of Phoenix, SRP, or any other potentially affected water provider.

RID relies on two unfounded assumptions in its evaluation. First, RID assumes that no other water provider will locate new production wells in the WVBA in the foreseeable future. But both SRP and the City of Phoenix expressed their intention to access groundwater in the area in the future. And both SRP and the City of Phoenix asked that remedial action in the WVBA be balanced with conservation of groundwater in place for future uses, and expressed concern that neither water quality *nor water quantity* be sacrificed. In contrast to RID's proposed remedy, the Working Group's proposed remedy includes future actions to provide for water uses when they are needed, and conservation of groundwater in the meantime.

Second, RID assumes that it will continue to pump groundwater from its wells past 2026 and for the duration of the remedial action. RID assumed that no other water provider will be affected so long as RID's pumping continues. But RID's ability to continue its same groundwater pumping after 2026 is in dispute,

[14] This is documented by RID's August and September 2013 pilot treatment system monthly progress reports. http://www.wvgroundwater.org/project-documents

[15] *Id.,* May through September 2014 monthly progress reports.

[16] RID Draft FS, at 101 n. 146.

and will not be resolved before the WVBA remedy is selected. RID's omission of a contingency for these water providers in the event of a change in regional pumping is a serious deficiency in its FS and is inconsistent with the ROs established by ADEQ for the WVBA.

In addition, RID's proposed remedy negatively impacts the ROs for the other water providers. RID's proposed export of groundwater resources outside of the City of Phoenix's Service Area will have negative impacts on the City's Designation of Assured Water Supply, and long-term groundwater extraction is contrary to the Arizona Department of Water Resources (ADWR) Groundwater Management Act "safe yield" goal. This will negatively impact their ability to rely on groundwater beneath the WVBA for droughts and future growth.

5. Even though RID's proposal to sell water to drinking water providers outside the WVBA is a contingent future use, RID includes immediate actions and immediate costs in its proposed remedy.

RID cannot justify groundwater treatment because the groundwater extracted by RID's wells meets standards for current irrigation uses. Absent any current risks to the public from irrigation uses, no groundwater treatment is necessary. Nonetheless, RID has proposed treatment facilities at select irrigation wells because:

- RID claims it can sell groundwater to West Valley cities for potable uses at some point in the future; and
- Based on existing concentrations of COCs in some of the WVBA wells, RID claims that treatment is required before the groundwater would be suitable for a future potable use.

But neither of those two factors justifies construction and operation of treatment facilities now. Instead, treatment should be included only as a contingent remedy to be implemented if and when necessary.[17]

RID's future status as a potable water provider is highly contingent on numerous factors, many of which are beyond RID's or anyone's control. These factors include:

[17] *See* A.A.C. § R18-16-406.I.4.c (remedial objectives should include "time-frames when action is needed to protect against or provide for the impairment or loss of the use.").

- construction of a dedicated pipeline of 10 miles or more to deliver water to the West Valley;
- phase-out of deliveries of treated effluent from the City of Phoenix to the Main Canal without impacting contractual commitments and agricultural delivery obligations;
- legal and contractual barriers to transfers of groundwater to the West Valley;
- legal and contractual barriers to pumping past 2026; and
- negotiation and execution of contractual agreements with West Valley cities for water delivery.

RID assumes that potable use would not be viable for at least five years. But given the complexity of these issues, that assumption appears to be overly optimistic.[18]

RID also erred in assuming that contaminant levels at its wells in the future will mirror levels detected in the wells today. Water quality data indicate contaminant levels continue to drop steadily in the WVBA. Thus, even if RID someday begins delivering water for potable uses, groundwater contaminant levels remaining at that time—expected to be substantially lower than today's concentrations—will dictate the appropriate remedial actions, if any. Such future actions could include adjusting pumping regimens, modifying wells, blending, replacing water supplies, or implementing other measures that would obviate the need for well-head treatment. Therefore, it is inappropriate to include well-head treatment as a current requirement in the RID Draft FS. Rather, treatment should be provided for solely as a contingent remedy to be triggered only if water quality is impaired when RID has resolved with finality the legal hurdles to sell treated groundwater to potable water providers and has constructed the infrastructure required to transport the water.

Because treatment for potable use should be only a contingent remedy, inclusion of treatment and operation and maintenance (O&M) costs as current costs also is inappropriate. Costs for any necessary treatment and O&M should be included only for the appropriate timeframe – whenever the pipeline is actually constructed, an end user is ready to accept the treated water, and the

[18] RID Draft FS, at 133.

conveyance system is operational. As is, therefore, RID's costs are grossly overestimated. Specifically with regard to the cost of RID's proposed remedy (Less Aggressive), estimated O&M costs are approximately $10,250,000 too high ($2,049,500 O&M per year for at least 5 years). The capital costs are also too high for the same reason because building infrastructure five or more years into the future has to be discounted to present value. Finally, as noted below, RID significantly overstates its costs by using an inappropriate discount factor.

6. RID's Early Response Action may not be included in the final selected remedy unless it is demonstrated to be reasonable, necessary, and cost effective in compliance with the WQARF rules.

RID's proposed remedy incorporates the treatment systems it has installed as part of its ERA. But those treatment systems are not necessary to address WVBA contamination, are not reasonable or cost effective, and should not be part of the final remedy. In defense of its proposal, RID argues a series of unsupported assumptions and assertions:

- RID argues that some of its wells are threatened because they are a certain distance from the plume, ignoring the facts that the plume is not migrating, no RID wells are currently impaired, and no RID wells are likely to be impacted in the future.
- RID also argues that some of its wells are currently impaired, even though those wells are suitable for their current use and no RID wells are likely to be impacted in the future as a result of declining VOC concentrations in the WVBA area.
- RID then argues that the threat to some of its wells justifies the wellhead treatment remedy of its ERA, even though the data clearly demonstrate that no current risk exists and the ERA is unnecessary to achieve the ROs.
- RID then argues that its proposed final remedy is necessary because the ERA was necessary. Even if the ERA had been necessary, the final remedy decision requires an independent and much more thorough evaluation than the ERA approval process.

The ERA review and FS review are two separate processes, so the standards for approving an ERA are irrelevant at this point. Nevertheless, RID cites the ERA

standards in its Draft FS, presumably as justification for selection of the ERA as the final remedy.[19] It is clear today, based upon current data and the Working Group's FS analysis, that the ERA is not a necessary, reasonable, or cost effective component of a WVBA final remedy.

Instead of focusing on the evaluation of wellhead treatment as a component of the final remedy, RID attempts to justify its final remedy under the ERA rule's presumption [20] that wells within a certain distance from a contaminant plume are considered threatened.[21] Again, Section 405 is irrelevant to the decision currently before ADEQ. But even if this presumption were relevant, decades of monitoring and volumes of data on the plume's location and movement easily rebut ERA rule's presumption.[22] RID admits, as it must, that the plume is not migrating and will not migrate as long as RID's pumping continues. Even if the plume began moving and reached a new RID well in the future, the low COC concentrations would not necessarily render the well unsuitable for use without treatment. Therefore, RID cannot rely on the presumption to justify its proposed remedy.

RID also ignores the fact that COC concentrations in most areas of the plume are declining. Based on the most recent available data, at least 10 of RID's wells are outside the WVBA plume and cannot be considered threatened, much less impacted. COC concentrations in other RID wells are generally declining, and all of RID's wells are suitable for their current uses without treatment.

Section 405(I) was intended to create a presumption allowing approval of an ERA if early action is being contemplated and insufficient data exist to determine whether a well is likely to be impaired before a final remedy can be implemented. But as provided for in Section 405(I), there are ample data demonstrating that RID's ERA is not necessary. In fact, we are now on the eve of final remedy selection and groundwater being extracted from RID's wells is less contaminated now than it was when RID first proposed its ERA. The only rationale RID has stated to justify its remedy is that its wells are located within a

[19] RID Draft FS, at 21.
[20] Section 405.I
[21] RID Draft FS, at 21.
[22] *See* A.A.C. R18-16-405.I ("This presumption may be rebutted by evidence of local hydrology, geology, or geochemistry or by available information regarding the capture zone or rate of flow.").

certain distance from the WVBA plume; given the available data, that is clearly an insufficient basis for approval of an unnecessary, multi-million dollar treatment system.

The conditional approval of the ERA does not mean that approval of RID's treatment systems as part of the final remedy for the WVBA is necessary or warranted. A well owner's preference for a remedy does not render the chosen remedy "necessary" by default and does not automatically require that it be included in the final remedy. Because ERAs are often conducted before a full site investigation has been completed, they are approved without the detailed information required for selection of a final remedy, and there is no analysis of alternatives. The final remedy selection process studies alternatives, and early actions may be included in the final selected remedy or not.[23] If the FS evaluation determines that the RID ERA is not reasonable, necessary, and cost effective, or if it determines that other actions are superior, then RID's early action may be rejected as an ongoing part of the final remedy.[24] The Working Group has demonstrated that RID's treatment systems are not necessary for the final remedy.

The WQARF rules do not require, as RID implies, immediate treatment for threatened wells. What the rule requires is that threatened wells be "addressed." If a well could be impaired in the future, the remedy may provide for action at that time. The remedy designed by the Working Group provides for reasonable and cost effective contingent remedies to address any of RID's impaired or threatened wells if they are ever needed for potable use.

7. ADEQ sampling of water at the end of the RID Salt Canal indicates that treatment for COCs will not be necessary for future uses.

Samples collected by ADEQ during 2013 show that the measured concentrations of both tetrachloroethene (PCE) and trichloroethene (TCE) at the end of the Salt Canal were less than 3 micrograms per liter (ug/l). In April of 2013, ADEQ measured PCE at 2.75 ug/l and TCE at 2.97 ug/l. In September of 2013, PCE was nondetect (< 0.5ug/l) and ADEQ measured TCE at 2.41 ug/l. In March of 2014, ADEQ measured PCE at 4.32 ug/l and TCE at 7.01 ug/l.

[23] *Id.* § R18-16-405.F ("Approval of an early response action under this Section does not constitute approval of the remedy for the site.").
[24] *Id.*

Water at the end of the Salt Canal has been consistently below the U.S. EPA Maximum Contaminant Level (MCL) for PCE, and intermittently below it for TCE. As COC levels continue to decline, it becomes even less likely that any treatment will ever be necessary to meet potable standards at the end of the Salt Canal if a contingent remedy is triggered.

8. RID does not provide a contingency to deal with uncertainties regarding future pumping.

RID's remedial action evaluation assumes that RID will be legally allowed to continue to pump water after 2026. Because there is currently a legal dispute over RID's right to continue pumping after 2026, and because that dispute likely will not be resolved before the WVBA remedy is selected, any remedy selected by WQARF must provide for a contingent action to address the possibility that RID pumping will not continue past that date. RID's failure to include consideration of such a contingency in its Draft FS is a fatal flaw.

9. RID overstates its authority to implement work in the WVBA.

RID overstates its authority to implement work at the Site. RID does not have "sole discretion" to take any necessary actions to implement an ERA[25] or "sole discretion" to implement the final regional groundwater remedy.[26] The applicable regulation provides only that a water provider has the discretion to implement that portion of an ERA or a remedy that involves that water provider's system.[27] The water provider is entitled to enter into an agreement with ADEQ to implement a portion of a final remedy that involves a specific well replacement, treatment, or alternative water supply to address the water provider's specific use that has been impacted. That discretion does not extend to unilateral identification of remedial measures. Those measures must be selected by ADEQ in accordance with the applicable rules and statutes. Nor does that discretion extend to implementation of a portion of the remedy that does not involve the water provider's system.

[25] RID Draft FS, at 24 n. 50 (citing A.A.C. § R18-16-411.G.
[26] *Id.* at 26.
[27] A.A.C. § R18-16-411.G ("The well owner or water provider whose water use is being addressed may, in its sole discretion, elect to construct, operate, or construct and operate the water treatment, well replacement or alternative water supply component of the remedy or early response action which is designed to address its use.").

10. RID incorrectly states that ADEQ has approved plume remediation as the WVBA remedial strategy.

It would be a violation of the WQARF rules for ADEQ to make a determination for a final remedial strategy before the strategy is first evaluated in an approved FS. Nevertheless, RID states that, "ADEQ has already determined that plume remediation within the WVBA Site is 'reasonable, necessary, cost-effective and technically feasible.'"[28] But ADEQ did not make that determination. ADEQ has also not pre-approved an aquifer restoration remedy. In fact, ADEQ representatives have previously gone on record as saying that a large-scale pump and treat system to remediate the WVBA plume will likely not prove to be a cost effective or viable approach to addressing such a laterally extensive area of contaminated groundwater, and that an aquifer management approach should instead be explored.[29]

11. RID's portrayal of Monitored Natural Attenuation (MNA) as a remedial approach that does not assure protection of public health and welfare and the environment is directly contrary to WQARF rules and statutes, ignores use of the strategy at successful groundwater remediation sites within the Salt River Valley, and is inconsistent with U.S. EPA policy.

In RID's evaluation of applicable remedial technologies,[30] it dismisses MNA as a viable remedial alternative. RID's Draft FS Report titles the MNA section as "monitoring," and not as a MNA remedial strategy. However, the RID Draft FS Report text clearly indicates that RID is discussing the MNA remedial strategy, not just monitoring.

Contrary to RID's view, aquifer management approaches and MNA remedial strategies are especially relevant to WQARF sites in general, and to WVBA in particular. In 1994 ADEQ staff began exploring alternative aquifer management approaches to WVBA, recognizing that pump and treat and aquifer restoration strategies might be technically and economically infeasible for the Site.[31] In 1997, the WQARF program built on those ideas, adopting new

[28] RID Draft FS, at 97, n. 136 (referencing ADEQ's correspondence regarding RID's ERA and Modified ERA Work Plans).
[29] Kulon, et al., Stepping Out of the Pump and Treat Rut: Central Phoenix Plume Management Strategy, Paper presented at the Seventh Annual Symposium of the Arizona Hydrological Society (1994).
[30] RID FS Section 5.1.5.
[31] Kulon, et al., at 1.

approaches to remediation at state sites. WQARF now recognizes the value of groundwater as a resource and specifically authorizes aquifer management approaches. ADEQ may approve a remedial action that may result in water quality exceeding water quality standards after the completion of the remedy.[32] This not only recognizes that aquifer restoration strategies are sometimes infeasible, it also reflects that the impact of a pump-and-treat remedy on the conservation of water resources is an important consideration in a water-short arid state.

WQARF allows balancing of groundwater remediation with aquifer conservation. It requires only that the remedy address current risks and provide for uses of water when those uses are needed, and then requires the maximum beneficial use of any water that must be pumped for one of those two purposes. WQARF allows contingent remedial actions to provide for treatment of water when the water is needed rather than encouraging large-scale pump-and-treat restoration remedies that would negatively impact the volume of water available for drought supply and other future demands.

The ADWR recently explained[33] the challenges of meeting future water needs in a desert state in "Arizona's Next Century: A Strategic Vision for Water Supply Sustainability":

> *"Conservation is the foundation of sustainable water management in our arid State. The continued commitment to using all water supplies as efficiently as possible is necessary to stretch our existing water supplies and has delayed the need to acquire other, more expensive, supplies. … "*
>
> *"Water demands driven by future economic development are anticipated to outstrip existing supplies. Additionally, the availability of surface water supplies have been reduced in recent years as drought conditions have been experienced locally and throughout the Colorado River Basin."*

The Strategic Vision provides a comprehensive water supply and demand analysis for Arizona. It notes that recent studies have identified the potential for a long-term imbalance between available water supplies and projected water demands over the next 100 years if no action is taken.

[32] A.R.S. § 49-282.06(D).
[33] ADWR, 2014.

Within the WVBA, the City of Phoenix relies on groundwater as a future supply to meet drought and future growth needs. This groundwater is accounted for in the City's Designation of Assured Water Supply. Because there are no current risks to be addressed in the WVBA, groundwater is suitable for current end uses, and groundwater COC concentrations continue to decline, MNA is an obvious remedial strategy to evaluate for the Site. The MNA strategy may be combined with measures to address impaired wells and contingent measures to address future changes in use that occur before the WVBA water quality is suitable for those new uses. Changes of use that occur in the future may or may not require further action depending on water quality at that time.

RID's dismissal of MNA as a viable remedial strategy is also inconsistent with U.S. EPA policy. Even at federal sites, where the regulatory goal is aquifer restoration and achievement of in-situ standards, MNA is a viable remedial strategy. In a recent U.S. EPA document entitled, "*An Approach for Evaluating the Progress of Natural Attenuation in Groundwater*" (U.S. EPA 600/R-11/204 December 2011), U.S. EPA supports the use of MNA as a viable remedy and provides an approach for evaluating MNA progress using trend analysis of groundwater concentration data. Note that a similar concentration trend analysis approach was used in WVB Working Group FS.

Furthermore, MNA has proven to be an effective remedy for aquifers within the Salt River Valley. In 1998, the Record of Decision (ROD) for the South Indian Bend superfund site (SIBW) in Tempe, Arizona listed MNA as the remedy for PCE and TCE concentrations in the central and eastern groundwater SIBW plumes. The selected remedy for the western SIBW plume was groundwater extraction and treatment. Based on the success of MNA in the central and eastern plumes, the SIBW ROD was amended to change the remedy for the western SIBW plume from extraction and treatment to MNA. In a June 8, 2004 letter, U.S. EPA notes that the State of Arizona concurred with the remedy change to select MNA as the final remedy for all of the SIBW groundwater plumes[34]. MNA is also being adopted as the remedial strategy at WQARF sites, including South Mesa.

MNA is a proven remedial technology in the Salt River Valley that is endorsed and accepted by both the State and Federal regulatory agencies. RID

[34] June 8, 2004 letter from Melissa Pennington (U.S. EPA Region IX Remedial Project Manager) to Kathleen Johnson (U.S. EPA Region IX, Federal Facilities Cleanup Branch) regarding Record of Decision Amendment for South Indian Bend Wash Superfund Site, Tempe, Arizona

erroneously dismissed MNA as a viable remedial strategy for WVBA and its Draft FS is incomplete without an evaluation of MNA as a remedial strategy for the WVBA groundwater plume.

12. RID confuses treatment for end use with containment or mass reduction.

Treatment of extracted groundwater has no bearing on physical containment of the plume. Containment is accomplished through hydraulic pumping and gradient induction. Nevertheless, RID states that, "Physical containment of the plume, through groundwater extraction and treatment, will assure protection of public health and welfare …"[35] There is no need to treat the groundwater to implement a physical containment strategy. Treatment is driven by end use requirements or other institutional or legal requirements. At present, groundwater extracted by RID is fit for its current end use. Treatment would *only* be triggered by a future change of use if that change occurs before COC concentrations have decreased sufficiently to render the water fit for the new use.

13. RID's FS did not evaluate system modifications to eliminate or minimize extraction of contaminated water to reduce COC levels in produced water and eliminate the need for treatment systems.

RID is solely able to control its extensive network of extraction wells in the WVBA to maximize the quality and quantity of water produced. Yet RID's Draft FS did not evaluate well modification or adjustments of pumping to eliminate or minimize capture of impacted groundwater from contaminated portions of the aquifer in order to reduce contaminant loading in produced water.

RID refers to well modifications and pumping adjustments, to "eliminate or minimize capture of impacted groundwater from contaminated portions of the aquifer, in order to reduce contaminant loading in produced water"[36] but the RID Draft FS then does not consider such modifications or adjustments in any of its alternatives. RID did not study well modifications that would allow it to pump from uncontaminated zones.

[35] RID Draft FS, at 98. RID makes a similar assertion regarding controlled migration, but this strategy also does not require treatment to be successful. *Id.* at 99.

[36] RID Draft FS, at 104-105.

RID also did not study adjustments to increase pumping from uncontaminated wells and other wells with the lowest contaminant levels, and decrease pumping from wells with higher contaminant levels. Cost-effective remedial benefits would result from such modifications and adjustments. RID's Draft FS instead assumed that pumping would be adjusted to accomplish the opposite – to increase contaminant levels in produced water.

The Working Group is not able to dictate adjustments to RID's system or operation of that system. But RID is obligated to cooperate with ADEQ as a prerequisite to any relief from well owner liability. A proper screening of remedial alternatives should include system modifications that would avoid the need for more costly remedies. RID's Draft FS failed to do this.

14. The goal of a WQARF remedy is to provide for reasonably foreseeable uses, not to remove contaminant mass simply for the sake of removing contaminant mass.

WQARF focuses on addressing impaired wells and current risks, and providing for reasonably foreseeable uses of water when and where they are needed. The intent of the WQARF program is not to remove contaminant mass for the sake of removing contaminant mass. Instead, contaminant mass removal is a remedial strategy or remedial measure that may be employed when necessary and justified to prevent or address an impaired use or address a current risk.

RID's proposed remedy attempts to transform its ongoing groundwater pumping regime into a remedy for the Site by characterizing it as a contaminant mass reduction strategy. RID evaluated remedies for RID's wells, instead of ADEQ's ROs for the WVBA. But RID's focus on contaminant mass removal as the measure of the success of its proposed remedy ignores the ROs selected by ADEQ for water providers. Hence, RID's approach is inconsistent with WQARF.

The Working Group was not constrained by the geography of RID's wells and instead prepared an FS that evaluated alternatives that would protect all water providers now and in the future. The remedial alternatives evaluated in the Working Group's FS would remove contaminant mass, but do so in a way designed to best achieve the ADEQ's ROs for the WVBA area. Those alternatives include installation of a strategically positioned extraction well to remove

contaminant mass from a specific area of elevated concentrations of COCs, designed to reduce the need for future water supply measures as part of the remedy.

15. RID's calculation of the contaminant mass removed by its proposed remedy is misleading.

RID claims that the remedial action proposed for its wells will remove 2,900 pounds per year of contaminant mass.[37] Elsewhere, RID says that the contaminant mass removal number is approximately 2,500 pounds.[38] Whichever figure is the intended one, the purported 30-year cost of this proposal is $50,800,000.

But at no additional cost, mere continuation of RID's historical pumping with no additional treatment removes mass from the aquifer. RID wants to treat that water so it can sell the treated water to potable water providers, and do so without a replenishment obligation or conservation requirements. But treating water withdrawn from RID's wells is not necessary to obtain contaminant mass removal, because contaminant mass removal will occur without treatment, just has it has been occurring for the past several decades. RID itself recognized this fact: "The regional pumping center created by groundwater withdrawals within the RID well field removes contaminants and contains the extent of groundwater contamination in the WVBA…".[39]

16. RID's comparisons to Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) remedies and its calculation of the cost and efficiency of its proposed mass reduction are erroneous.

The purpose of a WQARF FS is to compare alternative remedial approaches *at a given site* in order to select the most appropriate remedy. RID's comparison of the performance of WVBA remedial alternatives against remedies *at other sites* is irrelevant from a WQARF FS perspective. RID's comparative analysis is further flawed because the other sites are CERCLA sites, with fundamentally different remedy requirements. The comparison is also inappropriate because it fails to

[37] RID Draft FS, at 64.
[38] *Id.*, Table 10.
[39] RID Draft FS, at 124.

take into account the inherent differences in hydrogeological conditions and contaminant concentrations at the various sites.

RID's cost comparison is also incorrect because RID misstates its O&M costs in Table 10. RID argues that its proposed remedy will cost approximately $670 per pound of VOC removed based on a VOC mass removal rate of about 2,503 pounds per year and an O&M cost of about $1.7 million per year. But RID states in Tables 7 and 8, and elsewhere in its Draft FS that the annual O&M costs are $2,049,500.[40] Given this annual cost and RID's contaminant mass removal rate (2,503 pounds per year), RID's proposal will cost $819 per pound of VOC removal on an annual O&M basis. This makes the RID proposed remedy actually more costly (based on RID's own estimates) than both the Operable Unit 2 (OU2) remedy ($794 per pound VOC removed on an annual O&M basis) and the North Indian Bend Wash (NIBW) Central Treatment Facility remedy ($807 per pound VOC removed on an annual O&M basis). This is not "particularly cost effective," as RID contends.[41]

Nor is the overall cost (including capital and O&M costs) of RID's proposed remedy cost effective compared to the overall cost of Working Group's proposed remedy. The Working Group's proposed remedy has a total 30-year cost (assuming continued operation of extraction well EW-2 pumping at 500 gallons per minute [gpm]) of $12,930,000 and a total 30-year mass removal of 26,492 pounds. This results in the Working Group's proposed remedy cost of $488 per pound of VOC removed over 30 years. RID depicts a total cost of $50,821,238 by the end of 2044 for the same 30-year period.[42] RID claims it would remove approximately 75,090 pounds over 30 years. Therefore, RID's cost per pound of VOC removed over 30 years would be $677.[43] Thus RID's proposed remedy would cost approximately 40% more on a per pound basis over the next 30 years than the Working Group's proposed remedy. And as noted in Comment No. 17 below, RID appears to overestimate mass removal rates at its systems. Using a more

[40] RID also understates the O&M costs used in Table 10 to calculate cost per pound removed for the reference remedy, more aggressive remedy, and most aggressive remedy, which makes these alternatives more costly, on a dollar-per-pound annual O&M basis, than RID claims.
[41] RID Draft FS, at 190-191.
[42] RID Draft FS Table 8 page 3 of 8.
[43] The similarity to the cost RID presents in Table 10 appears to be coincidental but in no way justifies RID's use of an erroneous annual O&M cost in Table 10.

realistic mass removal rate would further increase the cost per pound of RID's remedy.

Note that in making projections of contaminant mass removal, both RID and the Working Group assumed that existing concentrations would remain constant over time. We know that this assumption is wrong because contaminant concentrations have been decreasing over time and that trend will continue. While all of these figures overestimate future contaminant mass removal, because they rely on the same assumptions, they are useful for comparative purposes.

17. The RID proposed remedy is actually *more costly* on a dollar-per-pound basis than regional CERCLA remedies, including both the OU2 remedy and the NIBW Central Treatment Facility remedy.

RID's presentation of the comparable costs between remedies in Arizona is misleading and uses values that are contradicted in other sections of the Draft FS. Using RID's own numbers, the RID proposed remedy is actually less efficient on a pounds per gpm basis and *more costly* on a dollar-per-pound basis than both the OU2 remedy and the NIBW Central Treatment Facility remedy.[44]

RID's assertions of its remedy's mass removal also appear to be "idealized", in that RID assumes constant, non-declining concentrations; 100% removal efficiency; and 100% operational up time on an expanded capacity basis. But RID assumes the mass removal rates for the other sites are on an actual measured performance basis. Comparing actual values to idealized values inappropriately skews the results to make RID's value look more favorable than is realistic.

In reality, the RID treatment plants have removed just over 1660 pounds over the last two years of operations – approximately 830 pounds per year – much less than the 2500 pounds per year estimated by RID. While RID proposes to install two new treatment plants, RID has proposed treatment at well locations that would have the two lowest groundwater COC concentrations in its system. Even assuming increased operational periods under a priority pumping plan, RID's mass removal projects are likely overly optimistic given actual past performance and the fact that VOC concentrations are expected to continue to decline over

[44] RID Draft FS, at 197-199. See also Comment 15 above.

time. Thus, the cost per pound removed under RID's proposal will be higher than RID projects.

18. The RID Model Report is fundamentally deficient and fails to explain modifications of its model.

RID's Model Report[45] is poorly documented and fails to include fundamental information recommended by standard guidance[46] to enable a reviewer to evaluate the model and how well its simulations represent actual observed hydrogeological conditions. The omissions and inadequacies are extensive. Following is a partial list of some of the key issues:

- Modeling Objectives. The modeling objectives are poorly defined and RID has not demonstrated that the model produces reliable results that satisfy those objectives. This may be in part due to RID's own admission of the limited utility of the model: "Given the slight differences between the projected regional hydrologic effects of remedial alternatives compared to baseline conditions are expected to be minimal. Therefore, the projected hydrologic effects from remedial alternatives are not expected to be a critical factor in the selection of the preferred alternative. The FS groundwater model was designed to be consistent with the expected use and importance of the model results in the FS and the subsequent decision making process for the groundwater remedy."[47]

- Model Function. RID has not documented how the model was used to satisfy the modeling objectives.

- Conceptual Model. The Draft FS contains no discussion of the hydrologic conceptual model (CM) and how the model was constructed to represent that CM. The particle track figures make clear that there are inherent flaws in the construction of the model in this regard. Model Layer 1 is described as representing the upper and more conductive portion of the Upper Alluvial Unit (UAU). Although there is no discussion or justification for the model layering, based on the conductivity values

[45] RID Draft FS, Appendix F.
[46] *See*, *e.g.*, ASTM D5718-95, Standard Guide for Documenting a Groundwater Flow Model Application (2012).
[47] RID Draft FS, Appendix F, at 2-3.

assigned, Model Layer 1 would appear to be representative of the Salt River Gravels described in Reynolds and Bartlett, 2002. Yet the forward particle tracks presented in Appendix F show particles migrating from the eastern portion of the model domain where there are no saturated Salt River Gravels.[48] Extensive investigations have documented that saturated Salt River Gravels are absent from the eastern portion of the Motorola 52nd Street OU2 area and all of the Motorola 52nd Street Operable Unit 1 (OU1) area as well as the area to the north of OU1. Numerous aquifer tests have been conducted throughout this area demonstrating the area is comprised of lower conductivity basin-fill materials. Yet even the lower conductivity values ascribed to Model Layer 2 tend to overestimate the measured conductivity values in the eastern portion of the model. Whether the layers are improperly constructed or hydraulic conductivity values improperly applied is impossible to determine based on the lack of substantive information in Appendix F. Either way, the modeling representation of the eastern portion of the model is fundamentally incorrect.

- Hydraulic Properties. No information is provided describing the understanding or representation of the aquifer system. No information is provided on hydraulic testing to support the hydraulic properties used in the model, justification for their distribution in the model, or how they were modified during the calibration process. RID should have provided a meaningful discussion of Site hydrogeology, aquifer characteristics, and hydraulic conditions to support its modeling efforts. There needs to be a sound hydrogeological rationale for the representation of hydraulic conditions in the model. RID reports that model calibration of hydraulic conductivity values was conducted using Parameter Estimation Software ("PEST"), but no documentation is provided showing how those values are calibrated. Typically, modelers apply constraints when using PEST to ensure that software-generated conductivity distributions are representative of observed conditions. However, examination of RID's figures of the distribution of hydraulic

[48] RID Draft FS, Appendix F, Figures F-25, 30, 35, 40 and 45.

conditions shows areas where the distribution is geologically suspect and inconsistent with measured values.[49]

- Water Balance. RID has not provided a water balance that describes how water enters the system, how it moves through the system, or how it exits the system. Providing a water balance is a key component to document that the model is not biased by boundary conditions or other assumptions.
- Boundary Conditions. No justification is provided for the boundary conditions used in the model and RID has not demonstrated that the modeled boundary conditions are representative of the hydrologic conceptual model.
- Model calibration. Only minimal discussion is provided of model calibration and no supporting information is provided to show how the calibrated hydrogeological framework, hydraulic properties, and boundary conditions adequately represent observed conditions. No information is presented showing how modeled groundwater flow conditions compare to observed conditions and residual head differences, nor is there is any discussion of spatial bias in the model.
- Coarse Grid Size. The model uses a uniform and relatively coarse grid size (660 feet) without any refinement in the area of interest – particularly in the area of the proposed remedial extraction. The coarse grid size will over-represent the effects of pumping for remediation purposes.
- Modification of Central Phoenix Model. RID apparently used a modified version of the original Central Phoenix Model (CPM) to perform particle tracking.[50] RID seems to have modified the original hydraulic conductivity (K) values in a few areas of the model domain. As a result, the K values in the upper layers of the model are significantly smaller than K values used in other models of the area, and the RID model generally results in wider hydraulic capture zones with less pumping.

[49] RID Draft FS, Appendix F, Figures F-7 through 11.
[50] *Id.*, Section 4.9 and Appendix F.

RID did not explain its rationale for making these modifications to hydraulic conductivity values.

- Reduced Pumping Rates. RID used the fracture well package in MODFLOW-SURFACT to simulate pumping wells. This package allows for an operator to decide when to reduce well pumping rates if the water level drawdowns exceed a certain amount. RID did not discuss how much pumping is lost through this mechanism in its model, but this information could be significant in the evaluation of RID's remedies for its wells.

Overall, given RID's failure to provide any substantive documentation of its modeling efforts or a demonstration that the modeled results reasonably represent observed conditions, the modeling simulations provided by RID cannot be relied upon for remedial evaluations as part of the FS.

19. RID portrays a contaminant plume that is much more extensive than it would actually be 30 years from now. In fact, by that time the actual plume may not impact or even threaten downgradient water provider wells.

RID simulated 30 years of advective movement to show that RID pumping "stabilizes, for the most part, the regional groundwater contaminant plume."[51] RID then adds that, "Without RID pumping, the VOC plume in the WVBA Site (with contributions from the M52 [Motorola 52nd Street] Site) would move west towards COT (City of Tolleson)." However, no one has created a calibrated contaminant transport model of the WVBA, so there is no basis for this conclusion. To state that the plume would move west and be similar to the illustration provided in Appendix F, with no supporting evidence in the record, is misleading.

Furthermore, RID's conclusion is not supported by available data. TCE and PCE concentrations in the WVBA have declined over time and are expected to continue to decline as the result of source control measures in the WVBA and operation of other remedial actions in WVBA and M52.

[51] RID Draft FS, at 127.

RID's simulation does not consider the ongoing operation of the OU2 groundwater extraction system since 2001. Referring to the OU2 groundwater extraction system, RID acknowledged that, "Data from the monitor well network indicate the actions are effectively decreasing TCE concentrations in the vicinity of the groundwater extraction wells and in the alluvial groundwater plume west of the extraction wells. These results support the conclusion that the extent of the contaminant plume is likely reducing downgradient of the extraction system and migration of contamination into downgradient OUs is being mitigated."[52]

Despite this admission, RID failed to account for these facts in its model simulation. Hence, RID portrays a contaminant plume that is much more extensive than it would actually be 30 years from now. RID's conclusion that there will be actual or threatened impacts to downgradient water provider wells is not supported by available evidence.

20. RID misrepresents the impact of VOC transfers from water to air.

RID's use and description of data from the Joint Air Toxics Assessment Project (JATAP) report are also misleading. RID stated that air quality monitoring in the greater Phoenix metropolitan area has shown that TCE and PCE are commonly found in ambient air samples collected at several monitoring sites "in close proximity to the WVBA Site."[53] RID adds that "their average annual concentrations exceed national averages. Based on sampling conducted in 2005, the average PCE concentrations ranged from 0.89 to 0.94 micrograms per cubic meter ($\mu g/m^3$) and the average TCE concentrations ranged from 0.27 to 0.42 $\mu g/m^3$ at these monitoring sites."[54] RID would have the reader conclude that these data result from VOC emissions from its canal system and wells. Numerous serious concerns exist regarding RID's use of the JATAP data:

- The air sampling data to which RID refers are approximately 10 years old.
- Only two sampling locations of the five in the metropolitan Phoenix area were used by RID, and neither of these two sampling sites is in "close

[52] RID Draft FS, at 46; *see also id*. at 55 ("With respect to groundwater contamination entering the WVBA Site from the east, monitoring data in both the M52 Site and eastern part of the WVBA Site indicate M52 Site remedial actions are effectively decreasing TCE concentrations in the UAU groundwater plume.").
[53] *Id.* at 64.
[54] RID Draft FS, at 64.

proximity" to the WVBA Site. The two locations are West Phoenix and Greenwood. The Greenwood sampling location is more than 0.6 miles north of the Salt Canal and RID's nearest production well. The West Phoenix sampling location is over 2 miles north of the Salt Canal and RID's nearest production well. These locations are not close enough to the RID system to conclude that any detectable concentrations in these samples came from off-gassing from the RID's Canal or any of RID's irrigation wells.

- Neither TCE nor PCE was among the top five most abundant risk-weighted compounds for 2005 (the year of sampling) at either of these locations, meaning that TCE and PCE were minor components of the sampling results and suggest that other regional sources may be responsible for the observed constituents.
- Two of the other sampling locations that were part of the JATAP and that RID failed to mention had detectable levels of TCE and PCE, and the average concentrations of PCE at each location was *higher* than the samples collected closer to the RID system.
- Finally, the average concentrations that RID presents in the Draft FS at these air sampling locations (0.89 to 0.94 $\mu g/m^3$ for PCE and 0.27 to 0.42 $\mu g/m^3$ for TCE) are all below the Arizona Ambient Air Quality Guidelines (2.1 $\mu g/m^3$ for PCE and 0.76 $\mu g/m^3$ for TCE), as reported in the JATAP Report.[55]

RID implies that the JATAP report indicates that RID pumping increases concentrations of VOCs in ambient air at levels greater than the national average. This is simply not supported by the data presented in the JATAP report.

21. The RID canal that transports contaminated water is not, in fact, "largely open to public access".

The majority of the conveyances that carry COC-affected water from RID's production wells are either piped or covered and are NOT open to public access as alleged by RID. In fact, RID admits that of the 5 miles of laterals and 7.5 miles of Salt Canal, only about 1,850 feet, or 3 percent, are open channel

[55] *Id.*, Table 3-3.

conveyances.[56] Regardless, the COC concentrations in groundwater in its open channel conveyances would not pose risks to human health.

Nine miles of the ten-mile Main Canal, on which Well RID-86 (the RID Draft FS Report cover photo) is located, are open. But the Main Canal, which contains wastewater effluent mixed with groundwater, contains minimal COC concentrations that present no risk to the public. Even if that portion of the system were factored in, only about 42 percent of RID's system in WVB (49,370 feet of 118,800 feet total) is open to the atmosphere. Thus, RID's implication that its system poses a risk to the public because it is "largely open to public access" is misleading.

22. Assumptions relied on in RID's evaluation of water supply measures are inaccurate.

RID dismisses the provision of replacement water supplies as a remedial strategy because of "the magnitude of water supply that would be required to replace contaminated groundwater from impacted RID supply wells." RID then states that required replacement supplies would be "in excess of 80,000 gpm."[57]

RID again misrepresents the data to further its cause, overestimating required replacement supplies by at least a factor of ten. A pumping rate of 80,000 gpm represents the total high-demand production of all of RID's wells. It does not represent the pumping required to replace "contaminated groundwater" from RID's wells to keep RID "whole." Based on RID's numbers presented in Table F-4, that pumping rate would amount to no more than 7,500 gpm, the annualized production volume of the six RID wells RID proposes to treat as part of its proposed remedial alternative.[58] The actual volume of replacement water required would likely be less than that, and would depend on contaminant levels in RID wells at the time of any future use. Therefore, the rationale to dismiss this replacement water supply remedial strategy is not supported by the actual facts.

[56] *Id.* at 78.
[57] RID Draft FS, at 124.
[58] The 7,500 gpm figure is calculated on an annualized basis. Due to down time, this is less than the physical capacities reported in Table 6 (10,750 gpm).

Furthermore, even the replacement of the water from all of these six wells would not, based on RID's own modeling, result in "failure to maintain plume containment and migration control" as suggested by RID.[59] RID should be required to evaluate replacement water supplies as an alternative remedial strategy in its FS.

23. RID's status as a WVBA Potential Responsible Party (PRP) is uncertain but it nonetheless has a duty to cooperate.

A well owner who is not a responsible party pursuant to title 49, chapter 2, article 5 and who cooperates with the investigation and remedial activities of the Director and ADEQ to the extent possible and consistent with the owner's water delivery responsibilities and system operational requirements, receives a covenant not to sue from ADEQ under section 49–282.04, subsection C. [ARS 45-605(c)]

It is not clear whether ADEQ has completed its investigation of RID's maintenance activities over the years or how ADEQ is treating the movement of contaminants caused by RID's operations of its wells. But for discussion purposes, if ADEQ decides that RID is not a WVBA PRP, and RID intends to seek relief from liability for its past operations, RID is required to cooperate in implementation of a remedy that achieves all remedial objectives, not a remedy that maximizes contaminant concentrations in produced water to justify installation of treatment systems at WQARF expense so that RID can sell treated water to potable water providers.

24. RID is required to address any conduit wells located in the WVBA to prevent cross-contamination.

RID owns a number of wells within the WVBA contaminant plume that are completed across multiple hydrologic units in areas with reported downward vertical gradients.[60] Based on the data provided by RID, these wells are not operated continuously and when not being operated may be acting as conduit wells, transporting contamination to deeper, un-impacted units. Although RID discusses well modifications to draw from either un-impacted aquifers or solely

[59] RID Draft FS, at 125.
[60] Terranext RI Report, Section 3.4.3

from impacted aquifers,[61] well modification to prevent cross-contamination is not considered. As the entity that both controls these potential conduit wells and developed its proposed remedy to address contamination at the WVBA, failure to address this issue is a critical oversight and fails to meet the requirements of A.R.S. § 49-282.06.A.2.

25. RID fails to provide sufficient data to support its claims.

The RID Draft FS report fails to include sufficient information to verify the accuracy of its claims. Notably, the FS fails to provide any level of detail supporting the capital and O&M costs of the remedies that are evaluated. Additionally, RID's reported annual average production overstates the annual average production reported to ADWR. RID also has not supported the calculated contaminant mass removal rates for years when no VOC sampling was conducted at the RID wells.[62] The FS needs to have sufficient documentation, available for public review, supporting its findings.

26. RID attempts to increase its production capacity in the WVBA area beyond what is allowed by the rules.

RID's wells are suitable for their intended use without treatment, as discussed above and as evidenced by RID's recent prolonged self-imposed shutdown of its treatment systems. Nevertheless, RID argues that the pressure loss encountered through use of the LGAC vessels requires its remedial action to include work and costs associated with increasing the overall capacity of RID's production capabilities in the WVBA to offset this loss.[63] RID cannot justify improvements to and expansion of its system due to treatment losses because treatment is not required for current uses in the first place.

27. RID misapplies well modification considerations in order to increase its production capacity.

As noted above, RID failed to consider well modification to address the potential for contaminant migration in its conduit wells in the WVBA. RID did indicate that modifications to produce water from solely un-impacted waters or solely from impacted portions of the aquifer would be retained for further

[61] RID Draft FS, at 5.2.2.
[62] RID Draft FS, at 65.
[63] RID Draft FS, at 139.

analysis.[64] However, RID only considered well modification in its discussion of remedial measures as a means to equip several RID wells with larger pumps to increase RID's production capabilities.[65] There is no justifiable basis for increasing production from those wells to protect human health or the environment. Furthermore, this approach conflicts directly with the interests of the City of Phoenix and SRP in maintaining future water supplies in their service areas. Therefore, such measures are not appropriate elements of the WVBA remedy.

28. RID's proposal to replace Well RID-106 is unnecessary and contrary to statute and rule.

RID proposes to replace Well RID-106 for the sole purpose of increasing its groundwater production capacity.[66] As noted above, there is no justification for increasing RID's production capacity in the WVBA and doing so is in conflict with the ROs of other water providers in the area. More significantly, RID proposes to construct the RID-106 replacement well with perforated well casing and gravel pack across both the UAU and the Middle Alluvial Unit, thereby creating a new potential conduit well. RID's proposal to create a new potential pathway for vertical cross-contamination is contrary to law and should be rejected.[67]

29. RID overestimated the cost of its proposed remedy by using an inappropriate discount rate to calculate present value costs.

RID uses a discount rate of 3% to calculate present value costs, thereby significantly increasing the cost estimates for its proposed remedy.[68] RID justified this approach in part by citing federal guidance in an Office of Management and Budget (OMB) circular.[69] However, the cited guidance specifically states that, "The rates presented in Appendix C do not apply to regulatory analysis or benefit-cost analysis of public investment."[70] Further, OMB states that, "This Circular does not supersede agency practices which are prescribed by or pursuant to law,

[64] RID Draft FS, Section 5.2.2.
[65] *Id.* Section 7.
[66] RID Draft FS, at 139.
[67] *See* A.R.S. §§ 49-282.04.A and § 45-605.E; A.A.C. § R12-15-812.B ("In all water-bearing geologic units containing mineralized or polluted water as indicated by available data, the borehole shall be cased and grouted so that contamination of the overlying or underlying groundwater zones will not occur.").
[68] RID Draft FS, at 190 n.220.
[69] Memorandum from the Director of the OMB, 2014 Discount Rates for OMB Circular No. A-94 (February 7, 2014).
[70] *Id.*

Executive Order or other relevant circulars."[71] The Circular specifically notes that it is intended for internal agency evaluations only.[72]

U.S. EPA's policy on the use of discount rates is stated in the preamble to the National Contingency Plan (NCP)[73] and in the Office of Solid Waste and Emergency Response (OSWER) Directive 9355.3-20.[74] The U.S. EPA Guidance states specifically: "Based on the NCP and this directive, a discount rate of 7% should be used in developing present value cost estimates for remedial action alternatives during the FS."[75] U.S. EPA notes that while the OMB does issue annual updates to the rates set forth in Appendix C of the Circular, the 7% rate in the main portion of the circular is not updated on an annual basis. Indeed, review of the main body of OMB Circular A-94 confirms that, "Constant-dollar benefit-cost analyses of proposed investments and regulations should report net present value and other outcomes determined using a real discount rate of 7 percent."[76]

Therefore, if RID was trying to comply with federal guidance, it should have followed OSWER Directive 9355.3-20, and utilized a discount rate of 7% for FS cost estimating purposes, or provided a specific explanation why it used a so much lower discount rate of 3%.[77] By using a discount rate of 3% compared to 7%, RID overestimated the cost of its proposed remedy by more than $14MM for the 30-year net present value (NPV) estimate and more than $24MM for its 50-year NPV estimate. As noted in earlier comments, this inflated cost is for a proposed remedy that is incomplete because it doesn't address the ROs for other water providers in the WVBA.

30. Section 4.4 of the FS is unnecessary and irrelevant.

RID's discussion of remedial objectives at other sites is unnecessary, irrelevant to WVBA, and not supported by A.R.S. § 49-287.03 or A.A.C. § R18-16-

[71] OMB Memorandum for Heads of Executive Departments and Establishments, Section 4 (October 29, 1992).
[72] *Id.*
[73] 55 Fed. Reg. 8722.
[74] USEPA, Guide to Developing and Documenting Costs Estimates during the Feasibility Study (EPA 540-R-00-002, OSWER 9355.0-75, July 2000).
[75] *Id.,* p. 4-4.
[76] http://www.whitehouse.gov/omb/circulars_a094#8
[77] USEPA, Guide to Developing and Documenting Cost Estimates during the Feasibility Study, *supra*, p. 4-5.

407.[78] The purpose of the FS is to evaluate and select remedial alternatives that are capable of achieving the ROs for the site in question.

31. RID's references to U.S. EPA Regional Screening Levels are misleading, inaccurate, and not applicable to the WVBA WQARF evaluation.

In its discussion of the regional extent of VOCs in groundwater, RID cites other regulatory standards and thresholds identified in the Final WVBA RI report, including Health Based Guidance Levels and Soil Remediation Levels and Groundwater Protection Levels, the latter two being immaterial to defining the extent of groundwater contamination.[79] But RID continues by stating that, "More recently, U.S. EPA developed risk-based screening levels applicable to CERCLA hazardous substances…"[80] RID's attempt to use the U.S. EPA screening levels is inappropriate. The risk-based standards known as Regional Screening Levels were developed during 2004 (when they were referred to as Preliminary Remediation Goals) and those standards have been periodically revised and updated since then. Thus, they were available to ADEQ when it developed the Final WVBA RI report. ADEQ properly ignored the Regional Screening Levels as screening criteria for COCs in the WVBA because they are not applicable to a WQARF evaluation. As described by U.S. EPA, the Regional Screening Levels are preliminary screening criteria for use at federal Superfund Sites.[81]

[78] RID Draft FS, Section 4.4.
[79] RID Draft FS, at 10-11.
[80] *Id.* at11.
[81] http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/usersguide.htm (last accessed October 10, 2014). It should also be noted that the Regional Screening Levels presented by RID in the FS report are out of date and were replaced with modified values as of May 2014.