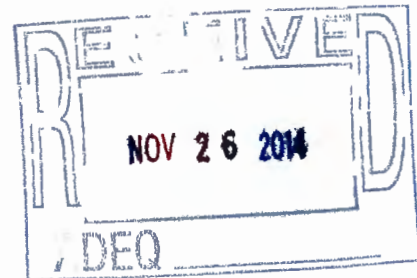




November 26, 2014

Scott Green, R.G.
Manager, Remedial Projects Unit
ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY
1110 West Washington Street
Phoenix, AZ 85007

Re: **RESPONSE TO ADEQ COMMENTS
ADMINISTRATIVE COMPLETENESS REVIEW OF
RID DRAFT FEASIBILITY STUDY REPORT**



Dear Mr. Green:

Synergy Environmental is providing this letter on behalf of Roosevelt Irrigation District (RID) to respond to Arizona Department of Environmental Quality's (ADEQ) analysis of the "administrative completeness" of the RID draft Feasibility Study Report (FS Report) dated July 2014. ADEQ communicated their findings of an internal review of this report for administrative completeness in a letter and accompanying checklist that was issued on October 24, 2014.

Four attachments to this letter provide clarification and expanded information to address the administrative deficiencies identified by RID and ADEQ and how the FS Report text has been revised to address the ADEQ comments. As requested, two copies of each written document are included.

- **Attachment A: Response to Comments** – provides a detailed response to each specific comment that ADEQ listed under the headings of "Required Information" and "Recommendations" in the October 24 letter. The information provided in the responses explains how the draft RID FS Report has been revised to address ADEQ comments. Specifically, revisions have been made to the following sections of the July 2014 Draft FS Report:
 - Section 2.2 (under *Profiles of Target COCs* discussion)
 - Section 8.1.4
 - Section 8.1.5
 - Section 8.4.1 (under *Risk* criterion discussion)
 - Section 8.4.2 (under *Risk* criterion discussion)
 - Section 8.4.3 (under *Risk* criterion discussion)
 - Section 8.4.4 (under *Risk* criterion discussion)
 - Section 9.1.4
- **Attachment B: Proposal for Public Notice** – completes compliance with AAC R18-16-413.A.7 required elements for "any person who seeks approval of a remedial action at a site or a portion of a site." RID had previously included the "list of the names and addresses of persons whom the applicant believes to be responsible

parties under A.R.S. § 49-283 and a summary of the basis for that belief,” which is required for ADEQ approval.

- **Attachment C: Hard Copy of Revised July 2014 Draft FS Report Text** – provides a hard copy of the complete text of the July 2014 Draft FS Report including proposed changes to Sections 2, 8, and 9 of this report that were made in response to the ADEQ comments. The revisions to the text in these sections are shown in redline/strikeout format so ADEQ will be clear on the changes we propose to make to the July 2014 draft FS Report to assure the report is administratively complete.
- **Attachment D: PDF Version of Revised July 2014 Draft FS Report** – provides a complete copy of Draft FS Report text in PDF format on compact disk, with the redlined text provided in Attachment C incorporated into this version. There have been no changes to any tables, figures, or appendices in the July 2014 Draft FS Report.

As discussed in RID’s October 31, 2014 letter to ADEQ and the November 19, 2014 meeting between RID and ADEQ, RID had failed in part to include all of the information in its written request submitted to ADEQ for approval of the FS Report as required in AAC R18-16-413.A. Pursuant to AAC R18-16-413.A.7, “any person who seeks approval of a remedial action at a site or a portion of a site” shall include a “proposal for public notice and an opportunity for public comment on the application for approval under this Section. The proposal shall include a list of the names and addresses of persons whom the applicant believes to be responsible parties under A.R.S. § 49-283 and a summary of the basis for that belief.” As noted in RID’s October 31, 2014 letter, RID’s failure to include a proposal for public notice was inadvertent. RID previously had complied with the second required element of AAC R18-16-413.A.7 to “include a list of the names and addresses of persons whom the applicant believes to be responsible parties under A.R.S. § 49-283 and a summary of the basis for that belief.” Therefore, with the attached proposal for public comment, RID’s written request for ADEQ approval contains all of the information as required under R18-16-413.A. RID expects that ADEQ will require a similar proposal from the Working Group, that is seeking ADEQ’s approval of its FS Report pursuant to AAC R18-16-413 consistent with its Agreement to Conduct Work with ADEQ, dated January 15, 2013. Similarly, RID expects that ADEQ will require the Working Group, pursuant to the mandatory elements of R18-16-413.A, to “include a list of the names and addresses of persons whom the applicant believes to be responsible parties under A.R.S. § 49-283 and a summary of the basis for that belief.”

RID appreciates that ADEQ has asked for more explicit information regarding the evaluation of the “risk” criterion specified in A.A.C. R18-16-407(H)(3)(b), that came from the ADEQ administrative completeness review. RID clearly believes this is one of the more essential comparison criteria that distinguishes the remedial action developed by RID versus that of the Working Group. Specifically, all remedial alternatives formulated by RID directly and systematically address the overall protectiveness of public health and the environment as required by the WQARF program by employing groundwater extraction and treatment as a principal element of the remedy to significantly and permanently



reduce the toxicity, mobility, concentration, and volume of hazardous substances in all routes of exposure to environmental receptors. The Working Group's proposed remedial action, on the other hand, does very little to mitigate the uncontrolled releases of hazardous substances into the environment or prevent the spread of groundwater contamination beyond the existing extent of the WVBA plume.

In consideration of the diametrically opposing views that exist regarding "risk" and what this means regarding the overall protectiveness of public health, welfare, and the environment, RID fully anticipates that ADEQ will select a groundwater remedy in the same legal, technical, and policy context that has been established at all other CERCLA/WQARF sites in Arizona. In this regard, ADEQ has consistently taken the position that it is:

- unacceptable to transfer VOC contaminants from groundwater to air,
- VOCs in groundwater should be removed from the environment and treated or disposed of appropriately, and
- groundwater remedial actions require a high degree of public protection against potential exposure to VOCs in air.

Moreover, based on ADEQ's position and strong feelings expressed by the public, EPA has affirmed their position that air emission controls are necessary, even in situations where risk assessment may conclude otherwise.

In sum, RID is glad for the opportunity to have a more substantive evaluation of "risk" and to urge consistency in applying this metric to the remedy selection.

Best Regards,

SYNERGY Environmental, LLC

A handwritten signature in black ink, appearing to read "Dennis H. Shirley", with a stylized, flowing script.

Dennis H. Shirley, PG

cc: Cover Letter only

Laura Malone, ADEQ Director Waste Programs
Tina LePage, ADEQ Manager Remedial Projects Section
Danielle Taber, ADEQ Project Manager
Donovan Neese, Roosevelt Irrigation District
David Kimball, Gallagher & Kennedy
Tim Leo, Montgomery & Associates

ATTACHMENT A

ATTACHMENT A

RID Response to ADEQ Comments Administrative Completeness Review of the July 2014 RID Draft Feasibility Study Report

Required Information: (Not identified in letter dated October 24, 2014)

As discussed in RID's October 31, 2014 letter to ADEQ and the November 19, 2014 meeting between RID and ADEQ, RID had failed in part to include all of the information in its written request submitted to ADEQ for approval of the FS Report as required in AAC R18-16-413.A. Pursuant to AAC R18-16-413.A.7, "any person who seeks approval of a remedial action at a site or a portion of a site" shall include a "proposal for public notice and an opportunity for public comment on the application for approval under this Section. The proposal shall include a list of the names and addresses of persons whom the applicant believes to be responsible parties under A.R.S. § 49-283 and a summary of the basis for that belief." As noted in RID's October 31, 2014 letter, RID's failure to include a proposal for public notice was inadvertent. RID previously had complied with the second required element of AAC R18-16-413.A.7 to "include a list of the names and addresses of persons whom the applicant believes to be responsible parties under A.R.S. § 49-283 and a summary of the basis for that belief." Therefore, with the attached proposal for public comment, RID's written request for ADEQ approval contains all of the information as required under R18-16-413.A.

Required Information: (As identified in ADEQ letter dated October 24, 2014)

1. *In accordance with A.A.C. R18-16-407(H), an FS Report shall include an evaluation of several topics regarding each alternative remedy. ADEQ was unable to locate the evaluation of:*
 - a. *A.A.C. R18-16-407(H)(3)(b)(iii): Exposure pathways, duration of exposure and changes in risk over the life of the remediation*

In response to ADEQ comments, RID has revised the findings included in the evaluation of "Risk" for each remedial alternative in Section 8.4 of the RID FS Report to clearly indicate that all groundwater alternative remedies address and reduce the primary exposure pathways for contaminants of concern (COCs) in groundwater, surface water, and air at the WVBA Site. Given that groundwater pumpage is the major outflow from the groundwater system, the remedial strategies and measures included in each groundwater alternative remedy substantially reduce the potential for exposed populations and environmental receptors to come in contact with COCs by the following mechanisms:

- Operational controls will be implemented to optimize pumping of RID wells in the WVBA Site to increase COC mass removal and enhance plume

containment. Priority pumping of RID wells in the center of the plume will prevent contaminant migration to other threatened water provider wells (including RID, SRP, and City of Tolleson water supply wells) and the direct use of this water supply at wells that are peripheral to and downgradient of the current plume boundary.

- Granular activated carbon (GAC) treatment systems will be installed at the mostly highly contaminated RID wells within the plume and engineering (or operational?) controls for blending with groundwater extracted at certain other less contaminated RID wells within the plume will be implemented to remove and reduce COCs from extracted groundwater to prevent the release of volatile chemicals into the environment above any applicable environmental or public health standards and therefore reduce the risk of imminent and substantial endangerment to public health and welfare from exposure to hazardous air pollutants by inhalation.
- Engineering controls will be implemented to restrict point source and fugitive emissions of COCs at well discharge structures and in open water conveyance laterals within the WVBA Site to eliminate incidental exposure risk to nearby residents and (unauthorized) public use of the RID water systems for swimming, bathing, and drinking.

There will be no “duration of exposure” or “changes in risk over the life of the remediation” associated with RID’s proposed groundwater alternative remedies since all alternatives substantially limit the exposure route for contaminant impacts to environmental receptors from COC releases to groundwater, surface water, and air. As a result, there is no continuing endangerment to the public health and welfare and the environment or unacceptable impact on water use once the remedy is implemented. Priority pumping to contain the plume will protect additional groundwater supplies outside the plume from being polluted and will assure peripheral and downgradient wells that are threatened by the contaminant plume will remain available for unrestricted use for the long-term future. Installed GAC treatment systems at the most highly contaminated RID wells and blending of certain less contaminated RID wells will capture, remove and reduce target COCs to assure the wells and water supply are available for all beneficial uses and prevent these contaminants from discharging into local surface waters and the air above any applicable environmental or public health standards.

The selected groundwater remedy will be operated until the contaminant concentrations in groundwater have been reduced to applicable aquifer water quality standards that are protective of human health and the environment. As further discussed in RID’s concluding comment, RID does not believe it is possible to meaningfully estimate the time it will take to achieve aquifer restoration. Instead, it was pointed out in the discussion of “risk” that contaminant concentrations will decline, but the rate of decline is uncertain and will vary depending on the location within the aquifer and proximity to

continuing sources, either local or regional. Further, the duration of the groundwater remedy will depend on other factors that are presently uncertain, including the presence of DNAPLs, changes in MCLs, and changes in aquifer conditions.

Although it is not possible to quantify the duration of cleanup, the RID FS Report provided an estimate of the relative amount of COC mass that would be addressed and removed annually by wells with designated treatment systems. Accordingly, the estimated COC mass removal associated with each groundwater alternative remedy is:

- Reference Remedy – 83%
- Less Aggressive – 77%
- More Aggressive – 77%
- Most Aggressive – 91 %

As evident, all alternatives would substantially and permanently reduce the mass of hazardous substances released and reduce public and environmental exposures and the associated health risk while the remedy is ongoing.

b. A.A.C. R18-16-407(H)(3)(b)(iv): Protection of public health and aquatic and terrestrial biota while implementing the remedial action and after the remedial action.

The characterization of risk associated with the proposed groundwater alternative remedies in the RID FS Report was dominantly focused on potential public health impacts. As indicated in the preceding comment response, there was substantial analysis regarding how and the extent to which installation of GAC treatment systems would prevent uncontrolled releases of hazardous substances into the environment and reduce the risk of imminent and substantial endangerment to public health and welfare for all groundwater alternative remedies.

In focusing the risk evaluation on public health, the RID FS Report did not document potential impacts to and protection of aquatic and terrestrial biota. This oversight has been addressed by revising the following text in the RID FS Report:

Section 2.2 - Contaminants of Concern:

- In the subsection, Profiles of Target COCs, an additional bullet point is provided to summarize the potential ecological impacts for each of the target COCs. For example, for TCE it is noted:
 - According to the June 2014 Toxic Substances Control Act Work Plan Chemical Risk Assessment, TCE poses a negligible ecological risk to aquatic and terrestrial biota due to its moderate persistence, low bioaccumulation potential, and low aquatic toxicity.

- The promulgation of significantly higher (less stringent) water quality standards for TCE applied to aquatic and wildlife designated uses under the Clean Water Act corroborates the overall low concern for potential ecological impacts related to TCE releases.
- As a volatile chemical, TCE concentrations are reduced substantially through volatilization when entering surface waters or terrestrial habitats.

Similar explanations will be provided for PCE and 1,1-DCE.

- In the subsection, Routes of Potential Exposure, the following language has been added to the first paragraph:
 - As identified in the previous discussion, the exposure pathway and potential for target COC releases to impact aquatic and terrestrial biota is of low concern. Consequently, further discussion of routes of potential exposure to target COCs and associated risks in this FS will focus on the substantially more significant concern for potential hazards to human health.

Section 8.4 – Detailed Evaluation of Remedies: Comparison Criteria:

- The following sentence has been added to the last paragraph of the discussion of Risk criterion for each proposed groundwater alternative remedy:
 - Reductions in contaminant releases to the environment would also be more protective of aquatic and terrestrial biota even though, as indicated in Section 2.2, the overall ecological risk associated with the target COCs is generally of low concern.

c. A.A.C. R18-16-407(H)(3)(b)(v): Residual risk in the aquifer at the end of remediation

RID believes an evaluation of the residual risk in the aquifer is adequately addressed in the discussion of the Risk criterion for each groundwater alternative remedy in Section 8.4. However, to be more explicit, the following paragraph has been added at the end of this Risk criterion for each groundwater alternative remedy:

- The residual risk in the aquifer is addressed by employing groundwater extraction and treatment as a principal element of the groundwater alternative remedies to permanently and significantly reduce the toxicity, mobility, concentration and volume of the hazardous substances. Consistent with RID requirements and the established remedial objectives for municipal water use, groundwater extraction and treatment in the groundwater alternative remedies will be conducted until aquifer water quality standards are attained and the groundwater supply is available for unrestricted use. Preferentially pumping of RID wells in the center of the plume will also

prevent further contaminant migration in the aquifer from polluting additional groundwater supplies outside of the plume. Treatment through GAC captures essentially all the contaminants in extracted groundwater and prevents uncontrolled releases of hazardous substances into surface waters and the air while implementing the remedy. The treatment systems are modular and can be relocated or replaced as needed to provide continued protection from residual contamination. Spent GAC media from the groundwater treatment process is sent to a permitted regeneration facility for permanent destruction of any residual contaminants.

- d. *A.A.C. R18-16-407(H)(3)(c): Transactional costs necessary to implement the remedial alternative, including the transactional costs of establishing long-term financial mechanisms, such as trust funds, for funding an alternative remedy*

As indicated throughout Section 8.4, RID's cost estimates for each groundwater alternative remedy were strictly for design, construction, operation and maintenance (O&M) of the wellhead treatment systems and other remedial measures included in each alternative. The O&M costs included three transactional cost components:

- 1) an annualized three percent assessment based on the total capital equipment cost to provide contingency funds to cover periodic costs needed for equipment maintenance, repair, and replacement;
- 2) an annualized six percent assessment of the estimated O&M cost for project administration and reporting; and,
- 3) an annual \$10,000 per skid charge for the additional power requirements for pumping at higher discharge pressures through the wellhead treatment units.

RID believes accounting for these specific design, construction, and O&M costs offers the most precise and objective basis for comparative evaluation of life-cycle costs of the proposed groundwater alternative remedies, as required by the FS process. Therefore, for the purposes of this FS, only these direct capital and O&M costs are included in the FS costing.

As mentioned in the RID FS Report, RID has incurred notable transactional costs that meet the definition of "remedial actions" in ARS § 49-281.12, including costs that have gone into development of the work that RID is committed to perform at the WVBA Site, which is to implement an Early Response Action and conduct the FS. Specifically, RID has incurred at least \$9.5 million in remedial action transaction costs over the past six years in conducting this work. These costs span a wide range of required project support, including evaluating the scope and impact of groundwater contamination, developing and implementing response action work plans, conducting required actions, and responding to extensive stakeholder input. Although indirectly needed to support RID's

initiatives, particularly given the potentially responsible parties (PRPs) protracted opposition to the cleanup efforts, these costs are not included as part of the FS capital costs because they are not “necessary to implement the remedial alternative” as specified in AAC R18-16-407.H.3.c. Further, these costs are in addition to the approximate \$6.2 million of direct costs expended to date for design, construction and O&M of wellhead treatment systems at four RID wells, and do not include debt services or legal costs in support of litigation.

RID did not include other transactional costs in the cost estimate, such as costs to establish long-term funding mechanisms for payment of recurring O&M costs for two reasons. First, these transactional costs are not “necessary to implement the remedial alternative” as specified in AAC R18-16-407.H.3.c. In a separate and unrelated matter, RID is pursuing a federal cost recovery action against the PRPs legally responsible for the groundwater contamination impacting RID’s wells within the WVBA WQARF Site. Although the FS Report or the implementation of the final remedy is not included in the current RID federal cost recovery action, a similar action would constitute a long-term financial mechanism for funding the selected remedy. Any recoverable monies in such an action would cover in perpetuity the funds necessary to implement the selected remedy and ensure that the State of Arizona and the Arizona taxpayers would not be burdened for the response costs that should be borne by the identified polluters. It is not yet determined how or under what arrangements the PRPs will pay these costs. Second, if an account is established with funds available for payment of long-term response costs then there should be no real transactional costs associated with administering this funding mechanism. Rather, the funds deposited to cover these costs will generate some level of investment return and this return will help offset future costs. For this reason, the RID FS Report used a discounted basis to forecast the net present value of long-term recurring O&M costs.

Recommendations

Although the United States Environmental Protection Agency has employed an informal policy of capping Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) remedial action costs at 30 or 50 years, ADEQ strongly recommends that RID perform a cost evaluation that is based upon the amount of time needed to reach numeric water quality standards as opposed to the subjective 30 or 50 year timeframe.

RID agrees with ADEQ’s stated position that capping the estimated remedial action costs at either 30 or 50 years is subjective. However, RID believes that defining costs based upon the estimated amount of time needed to reach numeric water

quality standards¹ is also subjective and more arbitrary² than using fixed timeframes. The RID FS Report did not estimate the timeframe for plume remediation within the WVBA Site because RID believes and has consistently stated that it is not possible to predict the duration of time it will take to achieve aquifer restoration with any confidence. For example, in the first document RID submitted to conceptually evaluate RID groundwater response actions at the WVBA Site³, it was stated:

Any objective analysis of aquifer restoration can only be conducted in relative terms. Moreover, at a site like the WVBA Site, with such pervasive and widespread groundwater contamination, the timeframe to restore groundwater cannot be estimated with a high degree of certainty. The groundwater restoration time is highly uncertain due to the presence of multiple continuing sources of groundwater contamination from undocumented COC releases and threatened releases to the subsurface, the potential presence of dense non-aqueous phase liquids in soil and groundwater, and diffusion-limited COC migration from recalcitrant fine-grained sediments throughout the site. In practical terms, it is likely that all remedial actions will require a long and indeterminate time to achieve aquifer restoration, which may be 50 to 100 years or longer.

Given the uncertainty in deriving any meaningful estimate of the aquifer restoration timeframe, RID followed EPA guidance⁴ for documenting FS life-cycle cost estimates of the proposed groundwater alternative remedies in terms of the commonly-used

¹ In fact, it is reasonable to assume that the current numeric water quality standards for TCE and PCE will change over the next 30 or 50+ years. After more than 20 years of scientific studies and debate, EPA has completed its health risk assessments for TCE and PCE and published new toxicity data for these chemicals in the EPA Integrated Risk Information System (IRIS). As explained in footnote 29 of RID's FS Report, TCE is now considered a more potent carcinogen while PCE is believed to be less so. For example, the revised toxicity data have led EPA to establish new risk-based exposure levels, termed Regional Screening Levels, for TCE and PCE in drinking water, that correspond to 0.44 µg/l and 9.7 µg/l, respectively. According to the EPA, the MCL standards set by the Office of Water have not changed but will be undergoing review as a result of the new IRIS assessment of TCE and PCE.

² Numeric water quality standards are not the only applicable water quality standards. Pursuant to state law, the applicable water quality standards include the narrative aquifer water quality standards that prohibit "a pollutant to be present in an aquifer classified for a drinking water protected use in a concentration which endangers human health ... [or] impairs existing or reasonably foreseeable uses of water in an aquifer." See ARS § 49-221.D and AAC R18-11-405.

³ *Draft Implementation Plan, Roosevelt Irrigation District Groundwater Response Action, West Van Buren Water Quality Assurance Revolving Fund Site*, prepared by Montgomery & Associates, September 25, 2009.

⁴ *A Guide to Developing and Documenting Cost Estimates During the Feasibility Study*, prepared by the U.S. Army Corps of Engineers and U.S. Environmental Protection Agency, July 2000.

30-year period for project duration. The RID FS Report also provided an estimate of the 50-year present worth to reflect longer project duration, anticipating this to be more representative of conditions in the WVBA Site. Calculations of any longer duration response costs are not included because future costs that may be incurred beyond 50 years are increasingly immaterial in terms of their present value. RID continues to believe the use of 30- and 50-year present value analysis is appropriate for the purposes of this FS, which is to generate cost estimates for comparative analysis and not budgeting purposes. Nevertheless, in light of the aforementioned technical uncertainties and the reasonable probability of a lower drinking water MCL for TCE in the future, RID believes that a 50- to 100-year horizon to achieve aquifer restoration is not unreasonable.

ATTACHMENT B

**NOTICE OF 30 DAY PUBLIC COMMENT PERIOD ON REQUEST OF
APPROVAL OF FEASIBILITY STUDY REPORT FOR THE WEST VAN
BUREN AREA (WVBA) WATER QUALITY ASSURANCE REVOLVING
FUND (WQARF) REGISTRY SITE**

PLEASE TAKE NOTICE that the Roosevelt Irrigation District (RID), a political subdivision of the State of Arizona, has submitted and seeks approval of a Feasibility Study Report for the WVBA WQARF Site pursuant to A.A.C. R18-16-407 and 413. The Roosevelt Irrigation District conducted the Feasibility Study pursuant to a Working Agreement with ADEQ and an ADEQ-approved Feasibility Study Work Plan to identify a remedy and alternative remedies capable of achieving the remedial objectives established by ADEQ for the WVBA WQARF Site.

The WVBA WQARF Site is located in Phoenix and is bounded approximately by W. McDowell Road to the north, 7th Avenue to the east, W. Buckeye Road to the south and 75th Avenue to the west. In addition, a finger shaped plume exists between 7th Avenue and 27th Avenue between Buckeye Road and Lower Buckeye Road.

A copy of the Feasibility Study Report is available for review at the Harmon Public Library, 1325 S. 5th Ave., Phoenix, AZ 85003. A copy is also available on the ADEQ web site, <http://www.azdeq.gov/enviro/waste/sps/wvb.html> or at ADEQ Records Center, 1110 W. Washington Street, Phoenix, AZ 85007. In Phoenix, please call (602) 771-4380 or email recordscenter@azdeq.gov 24-hours in advance to schedule an appointment to review the document. For further information on the WVBA WQARF site, please visit: <http://azdeq.gov/enviro/waste/sps/siteinfo.html>.

ADEQ will hold a Community Advisory Board meeting on December 1, 2014 starting at 6:00 pm, at ADEQ's office located at 1110 W. Washington Street, Phoenix, AZ 85007.

PARTIES WISHING TO MAKE COMMENTS regarding the request of approval may make such comments in writing to ADEQ, Attention: Danielle Taber, Waste Programs Division, Arizona Department of Environmental Quality, 1110 W. Washington Street, Phoenix, AZ 85007. Written comments will be accepted by ADEQ during the thirty day comment period that starts on December 2, 2014.

Questions regarding this notice should be directed to Wendy Flood, (602) 771-4410 or via e-mail flood.wendy@azdeq.gov.

Dated this 26th of November 2014