

# Common ADEQ Hydrology Comments on APP Applications

## **Purpose:**

Aquifer Protection Permit applications are reviewed to determine whether the facility meets the criteria to receive a permit. The process involves review by an ADEQ hydrogeologist which often generates requests for additional information from the applicant. ADEQ is looking for ways to reduce the number of requests for additional information. This page will assist applicants in preparing an application with all required information.

The information that supports your APP application is site specific and all of the items below do not necessarily all apply to your specific project. However, all of the items should be evaluated to determine which ones are applicable to your project. The intent of this page is to encourage applicants to check their submittal to make sure these areas are addressed.

## **Question: What is a Point of Compliance (POC)?**

**Answer:** Arizona Revised Statutes (A.R.S) §49-244 states *“The POC is a vertical plane down-gradient of the facility that extends through the upper most aquifers underlying the facility.”*

The vertical plane, as implemented by ADEQ, is typically the point in the upper most unconfined aquifer at the downgradient edge of the Pollutant Management Area (PMA).

## **Question: What is the difference between a Conceptual POC and a POC Well?**

**Answer:** The Conceptual POC is a locational point in APP permits for which groundwater monitoring is not required, and a groundwater monitoring well is not required to be installed. If it becomes necessary for groundwater monitoring to occur at a future time, a POC well would be installed at this Conceptual POC location.

A POC well is the point under the permit where compliance groundwater monitoring is required.

All APPs need either a Conceptual POC or an actual POC well.

## **Question: What type of information and why this information should be submitted with the APP application for a Point of Compliance (POC)?**

**Answer:** POCs, whether constructed, proposed, or conceptual are always required for an APP and should include the following information:

- Latitude and longitude locational data
- Location on the facility map
- Design for the POC well(s)

- No design is necessary for conceptual POCs
- Rationale on how the POCs were located (*i.e.*, based upon Pollution Management Area (PMA), property boundary, *etc.*) including:
  - Groundwater flow direction
  - Within 750 feet of the edge of the PMA (alternative demonstration)
  - For recharge – potential for upgradient POC
- Typically the screen length should be 60 feet.
  - For surface facilities and vadose zone discharges – POC well(s) must be screened across the water table
    - The reason for the POC well screen to be across the water table is to monitor where contamination is most likely to be present in groundwater
- For recharge and areas with large seasonal groundwater fluctuations the applicant may propose longer screen intervals with following information needed to validate the request:
  - Should always include hydrographs
  - Groundwater contour maps (actual and projected)
- Seasonal (agriculture) and/or discharge induced changes in groundwater flow direction or groundwater elevation levels
  - Groundwater contour maps (actual and projected)

**Question: What is a Pollution Management Area (PMA)?**

**Answer:** As defined in A.R.S. §49-244 *“The pollutant management area is the limit projected in the horizontal plane of the area on which pollutants are or will be placed. The pollutant management area includes horizontal space taken up by any liner, dike or other barrier designed to contain pollutants in the facility. If the facility contains more than one discharging activity, the pollutant management area is described by an imaginary line circumscribing the several discharging activities.”*

**Question: What type of information should be submitted with the APP application for Pollution Management Area (PMA)?**

- The application should always include a map with the PMA circumscribing the discharging facility or facilities
  - The map should always provide proper scale to see details of the facility location(s)
- The application should always provide rationale as to how the PMA was determined

**Question: What is a Discharge Impact Area (DIA)?**

**Answer:** As defined in A.R.S. §49-201(13) “Discharge Impact Area” means the potential areal extent of pollutant migration, as projected on the land surface, as the result of a discharge from a facility.”

**Question: When does a Discharge Impact Area (DIA) need to be evaluated?**

**Answer:** If the application is for a new APP, addition of new facilities, or a change in discharge volume the DIA must be evaluated.

**Question: What type of information should be submitted with the APP application for Discharge Impact Area (DIA) (A.A.C. R18-9-A202(A)(8)(b)(xii & xiii)?**

**Answer:** The application must contain the following information:

- Map with the facility or facilities DIA(s)
- Discuss the assumptions, methodologies and calculations used to determine the DIA
  - The DIA can be calculated using the following methodologies:
    - Numerical modeling
    - Analytically modeling (e.g., Darcy’s Equation)
  - DIA assumptions
    - Life of facility
    - Must include post-closure time (e.g., 30 years)
    - Amount of time to travel in the vadose zone to the aquifer (e.g., immediately or some time period after start of operation)
    - Hydrogeologic and geochemical properties used
- If the facility is a wastewater treatment plant that is engineered to not leak, the DIA is the same as the PMA
- If there is a facility that is engineered with a single or double liner, the DIA is the same as the PMA

**Question: What type of information should be submitted with the APP application for Facility Description (A.A.C. R18-9-A202(A)(1, 2, 3 & 4)?**

**Answer:** The application should always include the following:

- Topographic map
  - With appropriate scale to show details of facility location(s)
- latitude and longitude of all of the facility location(s)
  - The latitude and longitude for the above facility should also be included on the facility map

- All known property lines and structures
- Location of effluent discharge with latitude and longitude
- Show the effluent sampling point for the permit – include latitude and longitude
- Facility/Discharge history – if the facility has been in existence prior to permit issuance
- Characterization of proposed discharge, for new facilities
- Map that displays the facility and adjacent properties
  - A description of the uses of the adjacent properties should always be included
- All wells within 0.5 miles of the facility should always be located on a map
  - The uses and construction details of all of the wells, if available, should always be included

**Question: What is a Hydrogeologic Study?**

**Answer:** As defined in Arizona Administrative Code (A.A.C.) R18-9-A202(8)(a) states “*The hydrogeologic study shall demonstrate: (i) That the facility will not cause or contribute to a violation of an Aquifer Water Quality Standard at the applicable point of compliance; or (ii) If an Aquifer Water Quality Standard for a pollutant is exceeded in an aquifer at the time of permit issuance, that no additional degradation of the aquifer relative to that pollutant and determined at the applicable point of compliance will occur as a result of the discharge from the proposed facility;*”

**Question: When may an abbreviated Hydrogeologic Study or no Hydrogeologic Study be submitted?**

**Answer:** A.A.C. R18-9-A202(8) determines that under the following, limited conditions, the applicant may submit an abbreviated or no Hydrogeologic Study:

- Quantity and characteristics of the pollutants discharged
- The methods of disposal
- Site conditions

The only condition when no Hydrogeologic Study would be necessary is application amendments when the amendment is for no change in discharge rates, no changes in the footprint in existing facilities and no additional new facilities be added.

For a determination on whether an abbreviated Hydrogeologic Study is necessary, please conduct a pre-application meeting with the following information provided:

- What is the change in discharge rates
- Any relevant new hydrogeologic information since the last hydrogeologic study was performed
- For prescriptive BADCT

- For most, non-discharging wastewater treatment plants

**Question: What type of information should be submitted with the APP application for Hydrogeologic Study (A.A.C. R18-9-A202(A)(8))?**

**Answer:** The following information along with the specific information included in the above mentioned rule should be evaluated for each new application, significant amendments and some other amendments:

- Location of the facility on the FEMA 100-Year Flood Plain Maps
  - Location of the 100-Year Flood Plain on the proper scale facility map
  - Provide a description on potential flood impacts to the facility
- If groundwater sampling has been conducted, the site specific QA/QC details should be included
- If groundwater sampling has been conducted, the laboratory reports should be included, and the data provided in tabular format
  - Only reporting limit is to used, not non-detect in the data table
  - The laboratory should be instructed to provide reporting limits that are at or below any AWQs
- Depth to groundwater and groundwater flow direction should be provided, as well as the nature of groundwater occurrence beneath the facility, including a description of perched or regional groundwater aquifers and an evaluation of unconfined or confined conditions
- Due to the site specific nature of hydrogeology and geology, the specific amount of information to be provided in the Hydrogeologic Study should be discussed in detail at the Pre-Application Meeting
  - Should be specific on what is planned to be permitted so ADEQ can properly advise on the detail necessary for the Hydrogeologic Study

**Questions: What type of information should be submitted with the APP application in Proposing the Setting of Aquifer Quality Limits (AQL) and Alert Levels (AL)?**

**Answer:** The following information should be provided:

- Based upon the discharge characterization, determine the groundwater constituents of concern
  - Include an evaluation of all numeric and narrative AWQS in relation to the discharge characterization
- Evaluate regional groundwater quality in relation to facility discharge characterization to determine whether to use AWQS from rule or conduct ambient groundwater monitoring

- Discuss ambient groundwater monitoring and evaluation of the collected data as part of the Pre-Application Meeting
- The use of less than the detection limit for calculation of ambient groundwater quality should be discussed with ADEQ during the Pre-Application Meeting
- If none of the results of ambient groundwater sampling are greater than the AWQS for the constituent of concern, the AQL shall be the AWQS and no statistical analysis will be used
- ALs may be set at percentages greater than 80%, up to 100% of the AWQS, based upon ambient groundwater monitoring
- Ambient groundwater monitoring programs are typically between eight to twelve sampling rounds
  - Typically, for existing facilities, the sampling rounds are in quarters
  - Typically, for new facilities, the sampling rounds are in months

**Question: What types of hydrogeologic items for Closure and/or Post-Closure Costs should be included in an APP application?**

**Answer:** The following information should be included:

- For closure and/or post closure costs for hydrology include:
  - POC well(s) sampling
  - POC well(s) abandonment
- If soil sampling is proposed for closure, soil sampling costs should be included:
  - Analytical
  - Field collection methodology
  - Field equipment costs
- Post closure time
- Closure costs should be provided in sufficient detail for proper evaluation by ADEQ (i.e. – not lump-sum)

**Question: What type of information should be submitted to Demonstrate Protection of AWQS at POC well(s)?**

**Answer:** For any facility that has infiltration of discharge water onto surface soils and/or into the vadose zone, the following should be included:

- Evaluate the potential leaching of naturally occurring, or other existing vadose zone contaminant(s) to groundwater
  - Soil samples
  - 1-D or 2-D vadose zone leaching models
- Evaluate the potential impact at POC well(s) from the above leaching

- Fate and transport modeling
- Evaluate potential leaching of facility impacted vadose zone contamination
  - Soil samples
  - 1-D or 2-D vadose zone leaching models
- Evaluate the potential POC well(s) impact from the above leaching
  - Fate and transport modeling