

Pima County Department of Environmental Quality

Private Sewer Lift Station and Force Main Plan Review Checklist

Requirements for a 4.01 General Permit, Sewage Collection System, are found in the Arizona Administrative Code, Title 18, Chapter 9, Section E301

The most common plan submission errors are in Red

Application

_____ [Notice of Intent to Discharge](#) (NOID) application. R18-9-A301.B

- **Owner's information is complete**
- Engineer's information is complete
- Certification of Compliance has owner's name printed and has owner's signature and date
- **NOID is filled out completely**
- All NOID requirements specified in R18-9-A301.B are met
- The lot numbers requested in the NOID are shown on the plans and included in the Title of the plans

Wastewater Treatment Facility Capacity Letter

_____ A Capacity Letter or a Statement from the Wastewater Treatment Facility (WWTF) that assures there is capacity for this project in the downstream sewer collection system and the treatment facility flows and effluent quality limits will not be exceeded (R18-9-E301.C.1)

- **Capacity letter from WWTF is current**
- If project delivers wastewater to Private downstream collection system prior to being delivered to Public collection system, a capacity letter must be submitted from the owner of the downstream Private system stating that performance will be maintained pursuant to R18-9-E301.B in addition to the capacity letter required from the public WWTF

_____ Wastewater Management Acceptance Letter

- Per a letter dated, March 13, 2006, from Pima County Wastewater Management, any proposal to use private sewers must receive prior approval in writing from the Pima County Wastewater Management Department Director. Written approval from Pima County's WWM director for this project is provided or documentation that a single company or individual will be responsible for the operation and maintenance of the sewers within this project is provided.

Design Requirements

_____ An applicant shall design a Lift Station and Force Main according to R18-9-E301, including, but not limited to, the following:

- The “Standard Details for Public Improvements,” (2003 Edition), published jointly by Pima county Wastewater Management and the City of Tucson is used as the applicable design and construction criteria (R18-9-E301.D.1.c)
- Design flows are based on unit flows specified in Table1, Unit Design Flows (R18-9-E301.D.1.a)
- Design report lists the flows for each industrial and commercial facility or building
- **Design sewer lines and components to accommodate maximum sewage flows including Dry Peaking Factor, Peak Wet Weather flow, and all upstream sources and population (R18-9-E301.D)**
- Force Mains are designed to maintain a minimum flow velocity of 3 feet per second and a maximum flow velocity of 7 feet per second (R18-9-E301.D.4.a)
- Force Mains have appropriate valves and controls required to prevent drain back to the lift station (R18-9-E301.D.4.b)
- Incorporate air release valves or other appropriate components in Force Mains at all high points along the line to eliminate air accumulation (R18-9-E301.D.4.c)
- If the Force Main is not constructed using High Density Polyethylene, then restrained joints or thrust blocks must be used at appropriate locations to accommodate water hammer and surge control (R18-9-E301.D.4.d)
- The Force Main is designed to withstand a pressure of 50 pounds per square inch or more above the design working pressure (R18-9-E301.D.4.f)
- Force Mains are designed to control odor (R18-9-E301.D.4.h)
- Lift Stations must be secure to prevent tampering (R18-9-E301.D.5.a)
- Lift Stations must be protected from a 100-year flood event and cannot be constructed in a floodway (R18-9-E301.D.5.b)
- Ensure that the minimum wet well volume in gallons is $\frac{1}{4}$ of the product of the minimum pump cycle time, in minutes, and the total pump capacity, in gallons per minute. Calculations must be shown (R18-9-E301.D.5.c.i)
- Wet well is protected from corrosion to provide at least a 20 year operational life (R18-9-E301.D.5.c.ii)
- Wet well volume does not allow the sewage retention time to exceed 30 minutes unless the sewage is aerated, chemical are added to prevent or eliminate hydrogen sulfide formation, and adequate ventilation is provided (R18-9-E301.D.5.c.iii)

- The sewage from the wet well and force main cannot adversely affect downstream collection system or sewage treatment facility performance (R18-9-E301.D.5.c.iii)
- Ensure that excessively high or low levels of sewage in the wet well trigger an audible or visible alarm at the wet well site and at the system control center. If there is no “system control center” then the high and low level alarms must be connected to an “Auto-dialer” to notify the certified operator and the owner of the facility of the alarm status (R18-9-E301.D.5.c.iv)
- Ensure that a wet well designed to accommodate more than 5000 gallons per day has a horizontal cross-sectional area of at least 20 square feet (R18-9-E301.D.5.c.v)
- Ensure that a lift station is designed to prevent odor from emanating beyond the lift station site (R18-9-E301.D.5.c.vi)
- Lift stations are equipped with two pumps capable of passing a 2.5-inch sphere or are grinder pumps (R18-9-E301.D.5.d.i)
- Lift station must be capable of operating at design flow with any one pump out of service (R18-9-E301.D.5.d.ii)
- Piping, valves and controls are designed and arranged to allow independent operation of each pump (R18-9-E301.D.5.d.iii)
- Design shall ensure that pumps are self-priming and that pump water brake horsepower is at least 0.00025 times the product of the required discharge, in gallons per minute, and the required total dynamic head, in feet. Calculations must be shown. (R18-9-E301.D.5.e)
- If the lift station has an average flow of more than 10,000 gallons per day, include a standby power source and redundant wastewater level controls in the lift station that will provide immediate service and remain available for 24 hours per day if the main power source or controls fail. (R18-9-E301.D.5.f)
- All design documents, reports, and calculations have been signed, dated and sealed by an Arizona-registered professional engineer (R18-9-E301.C.7)

Construction Plans

- _____ Plans have been reviewed for conformance with Pima County’s Wastewater Design Checklist, Public Sewer Improvement Plans (Updated June 26, 2007). Pima County Wastewater Management’s Design Checklist may be obtained at 201 N. Stone, 2nd floor or viewed online at www.pimaxpress.com/Dev_Review/PDFs/WastewaterChecklist.pdf
- _____ The construction plans must have the signed approval of the Wastewater Treatment Facility on the plans prior to being submitted to PDEQ (R18-9-E301.D.4.e)
- _____ Plans are construction quality drawings that provide plans and profiles for force mains and lift stations with sufficient detail to allow verification of

design and performance characteristics (R19-0-E301.C.4.a), including the following:

- Inverts of all water main and force main crossings are on the profile sheet
- Show all thrust blocks, restrained joints and air release valves for force mains

_____ Force mains and lift stations meet the requirements listed in the Standard Details for Public Improvements,” (2003 Edition), published jointly by Pima county Wastewater Management and the City of Tucson. (Standard Detail No. WWM A-2)

_____ Where a force main discharges into a manhole, the manhole meets the requirements of Pima county [WWM Directive ENG2006-15](#) for interior coatings.

_____ Plans are clear, reproducible and in a 24 inch by 36 inch format (R18-9-E301.C.6)

_____ Plan sheets have been signed, dated, and sealed by an Arizona-registered professional engineer. (R18-9-E301.C.7)

_____ Drainage features and controls are shown on plan. (R18-9-E301.C.4.c)

_____ Force Main (sewer line) is placed 2 feet below the 100-year storm scour depth and constructed using ductile iron pipe if sewer lines cross or are constructed in floodways and elevations of both 100-year storm scour depth and force main (sewer pipe) are given (R18-9-E301.D.2.c)

_____ All lot numbers requested on the NOID and included in the design report are shown on the plans and also have the HCS stationing if individual house pumps are connected to a common low pressure force main.

_____ The “Standard Details for Public Improvements,” (2003 Edition), published jointly by Pima county Wastewater Management and the City of Tucson is used as the applicable design and construction criteria and this language is included in the general notes or the sewer notes. (R18-9-E301.D.1.c)

_____ Trenching and bedding details are indicated on the plans for each pipe material and size (R18-9-E301.D.2.h)

_____ The following statements must be in the general notes or the sewer notes on the construction plans:

- The project will be constructed and inspected under the direct supervision of a Professional Engineer, registered in the State of Arizona.

- After construction and final inspection, a Professional Engineer, registered in the State of Arizona, will prepare “As-built” plans and an [Engineer’s Certificate of Completion](#), and submit that information to PDEQ for approval along with all construction testing as required in accordance with Arizona Administrative Code R18-9-E301 (including manhole and/or wet well testing, force main leakage testing) in order to receive a Discharge Authorization.

_____ If the construction plans have both Public and Private sewers on the same set of plans, then the following apply:

- The plans must be clearly labeled as both Public and Private sewer plans
- Each sewer reach (gravity and force main) and manhole or wet well must clearly be labeled Public or Private
- There are General Sewer notes that apply to both the Public and Private sewer systems and there are separate Private Sewer Notes that apply specifically to the Private sewers and manholes.

Revised July 2007