

To: Eric Oppenheimer

11-23-2013

From: Fred Krieger, 510 843-7889

Re: Note on potential restraints on infiltration

It is possible that the apparently arbitrary 10 ft. requirement for the distance to seasonal high water in some MS4 stormwater permits will create an unnecessary restraint on groundwater recharge. In some locations a seasonal perched aquifer is created in the winter at shallow depths. In the Central Valley, many communities infiltrate a significant portion of their stormwater (see Fresno with 70% infiltration) and appear to not have problems. Follow-up investigation of these ongoing infiltration projects could help determine what level of protection is actually needed.

Reference: Schroeder, R.A., 1995, Potential for Chemical Transport Beneath a Storm-Runoff Recharge (Retention) Basin for an industrial Catchment in Fresno, CA, USGS Water Resources Investigations Report 93-4140. (posted [here](#))

“Most of these contaminants were found to be sorbed to the upper 4 centimeters of sediment, which also is the maximum depth to which atmospheric lead-210 penetrated. None of the contaminants were detected above back-background concentrations in the sediment at depths greater than 16 centimeters.”

(It should be noted that this site has an 8-meter-thick unsaturated zone beneath the basin.)

Reference

Last year, the State Board issued the [OWTS Policy](#) which takes a more nuanced approach regarding septic systems. For low risk new or replacement septic systems, the policy establishes the minimum depth as five to twenty feet depending on percolation rate (Table 2). For Impaired areas the policy states that “Separation of the bottom of dispersal system to groundwater less than two (2) feet, except for seepage pits, which shall not be less than 10 feet.”

A graduated depth approach similar to that used in the OWTS Policy may be appropriate in MS4 permits.

An example of a potentially unnecessary restraint in a stormwater permit is the following:

SF Bay Area [MRP](#) (pages 26 & 27) - (iii) Infeasibility to implement harvesting and re-use, infiltration, or evapotranspiration at a project site may result from conditions including the following:

- Locations where seasonal high groundwater would be within 10 feet of the base of the LID treatment measure.

For “infiltration devices” which include concentrated flows this becomes more explicit (page 31)

iv. Limitations on Use of Infiltration Devices in Stormwater Treatment Systems

- (1) For Regulated Projects, each Permittee shall review planned land use and proposed treatment design to verify that installed stormwater treatment systems with no under-drain, and that function primarily as infiltration devices, should not cause or contribute to the degradation of groundwater quality at project sites. An infiltration device is any structure that is deeper than wide and designed to infiltrate stormwater into the subsurface and, as designed, bypass the natural groundwater protection afforded by surface soil. Infiltration devices include dry wells, injection wells, and infiltration trenches (includes french drains).

- (2) For any Regulated Project that includes plans to install stormwater treatment systems which function primarily as infiltration devices, the Permittee shall require that:
- (a) Appropriate pollution prevention and source control measures are implemented to protect groundwater at the project site, including the inclusion of a minimum of two feet of suitable soil to achieve a maximum 5 inches/hour infiltration rate for the infiltration system;
 - (b) Adequate maintenance is provided to maximize pollutant removal capabilities;
 - (c) The vertical distance from the base of any infiltration device to the seasonal high groundwater mark is at least 10 feet. (Note that some locations within the Permittees' jurisdictions are characterized by highly porous soils and/or high groundwater tables. In these areas, a greater vertical distance from the base of the infiltration device to the seasonal high groundwater mark may be appropriate, and treatment system approvals should be subject to a higher level of analysis that considers the potential for pollutants (such as from onsite chemical use), the level of pretreatment to be achieved, and other similar factors in the overall analysis of groundwater safety);...

To promote groundwater recharge, it may be useful to review the MS4 permits to determine if they contain restraints beyond what is necessary to protect groundwater. This review could be supported by an investigation of current projects looking at infiltration/groundwater issues such as the LA area Council for Watershed Health as well as the long-term Central Valley infiltration programs.