

## Section 8 Technical Reports

### 8.g Groundwater Modeling Report

This section addresses *Larimer County Procedural Guide for 1041 Permits*, Item 8.g, and the criteria and standards described in LUC Sections 8.2, 8.12, 14.10.D.3, 14.10.D.4, and 14.10.D.11.

As discussed with Larimer County Planning staff at the Pre-Application Conference on May 26, 2016, a simplified groundwater report discussing construction methods and proposed best management practices (BMPs) to mitigate impacts to existing groundwater flow characteristics will meet the application submittal requirements.

#### **Overview of Groundwater Aquifers**

The TWP corridor is located within the South Platte River Basin, which comprises the northeastern quarter of Colorado, as shown in **Figure 8.g**. The major aquifers in the South Platte River Basin are alluvial aquifers associated with the South Platte River and its tributaries. The TWP corridor crosses through the Upper South Platte River Alluvium, which is specifically associated with the Cache la Poudre River, a river generally characterized as thin and discontinuous.

Groundwater levels vary along the TWP corridor within Larimer County with groundwater levels being higher around surface water sources such as unlined ditches, canals, reservoirs, lakes, and rivers and lower in areas farther away from surface water sources. In general, along the Interstate 25 corridor, which includes the TWP corridor, from Wellington south near Windsor and along Interstate 25 near Loveland, groundwater is anticipated to be less than approximately 20 feet below ground surface as identified in the *Groundwater Atlas of Colorado, Special Publication 53* published by Colorado Geological Survey, 2003. Along the other stretches of the TWP corridor, groundwater is generally expected to be found at depths greater than 20 feet below ground surface, although, as mentioned previously, higher groundwater levels may exist near surface water sources. The typical depth of bury for the water pipeline will be a minimum of 4 feet below grade. During the design phase, the depth to groundwater along the TWP corridor will be further identified and monitored through geotechnical investigations.



### **Construction and Long Term Mitigation Measures**

Mitigation measures that could be implemented with the TWP to minimize impacts to groundwater include the following:

- Installation of trench plugs constructed of impervious materials such as bentonite, other clays, or controlled low-strength material within the water pipeline trench. Trench plugs serve as dams that mitigate groundwater flow paths that could develop through typical water pipeline bedding material. Trench plugs could be installed periodically along and perpendicular to the water pipeline to deflect flow into native ground to maintain the natural hydrology.
- Installation of an impervious water pipeline trench backfill material such as bentonite, other clays, or controlled low-strength material to mitigate groundwater levels and groundwater flow paths.
- Compacting backfill material and soil disturbed during trenching. Compact with a backhoe, vibration machine, rollers, or other equipment. Compaction requirements and testing would be specified in accordance with standards of practice.
- Installation of porous backfill material to allow natural groundwater flow paths to flow around the water pipeline.
- Dewatering groundwater in trench excavation prior to water pipeline installation. Groundwater encountered in the excavations will be addressed in accordance with CDPHE regulations and the requirements of the construction dewatering permits. Groundwater is likely to be collected and pumped into either temporary retention ponds, land applied, or routed to appropriate storm drains in accordance with the dewatering permits.

Additional example BMPs and descriptions that could be used on the TWP are provided for reference in **Appendix D**.

The mitigation measures to be implemented will be specified in the construction documents and will be developed as part of the design process, including evaluation of geotechnical investigations.