Location of aquifer

Burren Plateau, Bell Harbour, Ireland

Reported by
T. McCormack

Type of medium (Karst, porous, fracture)
Karst

Type of aquifer (phreatic or confined)
Phreatic

Main lithology - (e.g. gravel, sand and clay)
Pure bedded Dinantian limestone

Hydrochemistry: fresh or saline
fresh

Saltwater intrusion: lateral from sea or lakes – upconing
Some saltwater intrusion known into wells very close to the coast. Also, a saline lake 50 m inland at Bell Harbour.

Aquifer geometry: hydraulic characteristics
Low-lying and coastal karst. Extensively karstified limestone, gently inclined (dipping 2-3 degrees to the south) pure bedded carboniferous limestone layers of several hundred meters in thickness, well-developed shallow epikarst layer of approximately 5-10m in thickness

Aquifer parameters: storage - annual water pumping - (in MCMA - millions cubic meters, annually)
not known but modeling currently being carried out to quantify this.

Depth of aquifer (water level and bottom) - water level 5- 30 m - aquifer depth - 50-200 m
water level 0-10m; aquifer depth 400 to 600m (at deepest)

Major chemistry (anions - ?; Cations - ?)
Not measured but as a carbonate aquifer calcium and carbonate will be dominate ions

Major salinity sources
sea

Population
very low (<200) – rural catchment

Aquifer status: special features - e.g. thermal springs, major faults,…
Groundwater flow rates within the region have been recorded using tracer tests at 50-150 m/hour under baseflow conditions (Drew and Daly, 1993). Intertidal springs discharging into the bay**.**

Investigation methods - e.g. water level measurements, EC (electrical conductivity profiles), TDEM (geophysical), chemical and isotopic methods, age determination, IR survey, seepage meters (for Submarine Groundwater Discharge, SGD)
Inception horizons (clay-band/wayboard), horizontal and vertical, were used as the primary input for the development of a 3D model of the karst conduit network in order to simulate groundwater flux through the aquifer. Continuous water level measurements of inland turloughs have also been carried out since 2014 to determine conduit size. Tracer studies carried out as well as an ERT survey.

Numerical hydrological modeling
Use of KARSYS to develop of a 3D geological model of the karst conduit network

Monitoring methods applied and duration - water level measurements, EC (electrical conductivity profiles - seasonal)
Continuous water level measurements of inland turloughs have been carried out since 20014 to develop a numerical model of the conduit network.

Management methods
none

Aquifer management actions
none

Identification of existing or potential problems
none

References

Mc Cormak T.. Vouillamoz J., Gill L.W., Modelling Inception Horizons and their Influence on Groundwater Flow Pathways in a Karstic Catchment. poster, AQUA2015, 42nd IAH Congress, 13-18 September, Rome.

McNamara M.E., Hennessy R.W., (2010), The Geology of the Burren region, Co. Clare, Ireland, Ed. The Burren Connect Project.