

Maroota extractive industry groundwater study

In 2018, the department looked into groundwater levels in the Maroota locality, approximately 50 km northwest of Sydney, to assess potential impacts of extractive operations on the aquifers in the Maroota area.

The groundwater level data that was collected during the study was analysed to determine a baseline. The baseline is used to ensure the activities of extractive industries (sand mines/quarries) remain above the groundwater table and do not interfere with groundwater withdrawal by other nearby users. The Department of Planning, Industry and Environment can also use the findings to provide a more consistent approach to the assessment of development applications for quarries in the Maroota area.

About Maroota

The Maroota locality supports a variety of competing land uses. Agriculture, market gardens, national park, state forest and extractive industry operations exist in the Maroota area. Sand mining and quarrying in Maroota is growing because of increasing demand for construction material, particularly for use in the Sydney region.

Extractive industry in Maroota

Mining or quarrying to extract sand/sandstone/gravel in the Maroota area is regulated. Operating restrictions require quarry operators to remain two metres above the high wet weather (maximum) groundwater level to comply with local council development control plans for the area.

This requirement is specific to the extractive industry in Maroota. The level of uncertainty in defining the depth to which operators can excavate under this rule has made it difficult to apply to development applications in a consistent manner. In some instances, quarry operators have installed their own groundwater monitoring bores.

The results of the department's study of groundwater levels provides a new baseline for applying the two-metre rule.

As well as the two-metre clearance rule, prior to commencing operations, extractive industries at Maroota must adhere to the guidelines and requirements of the NSW Aquifer Interference Policy, which can be downloaded from industry.nsw.gov.au/water/science/groundwater/quality

Groundwater at Maroota

The groundwater study focused on two aquifer systems—a shallow tertiary alluvial aquifer overlying a sandstone porous rock aquifer.

The Maroota sand deposit is located at elevation within an undulating ridge, and is both overlying and abutting the Hawkesbury sandstone formation. The area is elevated, with some springs discharging at the base of slopes along fractures or changes in geology type. In addition, there is some groundwater extraction occurring from shallow wells, excavations and deeper bores used for stock, domestic, irrigation or industrial purposes.

Extraction of water from these groundwater systems is managed in NSW through the state's *Water Management Act 2000*. The sharing of water in these groundwater sources is governed by the *NSW Water Sharing Plan for the Greater Metropolitan Region Groundwater Sources 2011* (see

legislation.nsw.gov.au/#/view/regulation/2011/111/part2/sec8). The groundwater sources relevant to the aquifers at Maroota are:

- Maroota Tertiary Sands Groundwater Source
- Sydney Basin Central Groundwater Source.

About the study

The department commissioned consultants to measure the groundwater levels in the shallow aquifer (Maroota Tertiary Sands Groundwater Source) and the deep aquifer (Sydney Basin Central Groundwater Source). Data was collected from approximately 60 monitoring bores (see Figure 1) during a field visit in April 2018. The data has been used to produce:

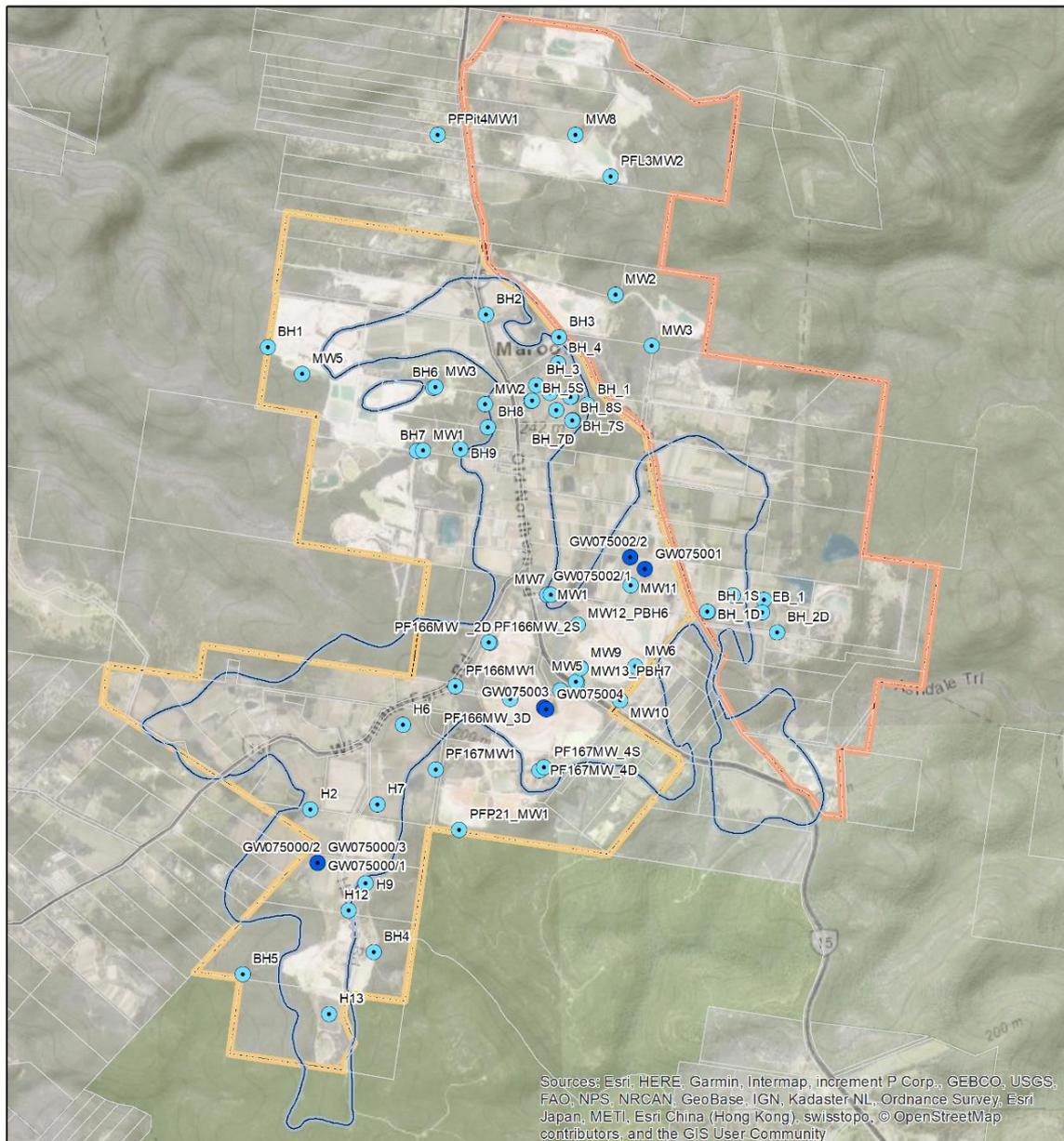
- contour maps of groundwater levels for the shallow and deep aquifer
- contour maps of historic high groundwater levels for the shallow and deep aquifer
- hydrographs of groundwater levels since 1998 for government monitoring bores in the shallow and deep aquifers
- cross-sections displaying ground surface, shallow/deep aquifer interface, and groundwater levels for the shallow and deep aquifer.

Analysis of the data for the period of record (20 years of groundwater monitoring) shows the high wet weather (maximum) groundwater level for early 2016 as representative of historic high levels.

More information

The Maroota extractive industry groundwater study was carried out by EMM Consulting in 2018. The consultant's report (available from the department's website at industry.nsw.gov.au/water/science/reporting/other-reports/maroota-extractive-industry-groundwater-study/Maroota-hydrogeological-study.pdf) gives more information on the geology and hydrogeology of the study area, as well as data analysis and conclusions.

© State of New South Wales through Department of Planning, Industry and Environment 2019. The information contained in this publication is based on knowledge and understanding at the time of writing (November 2019). However, because of advances in knowledge, users are reminded of the need to ensure that the information upon which they rely is up to date and to check the currency of the information with the appropriate officer of the Department of Planning, Industry and Environment or the user's independent adviser.



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

Explanation

- WaterNSW bores used for the study
- Private bores used for the study
- Maroota Tertiary Sands Groundwater Source
- Hornsby Development Control Plan 2013
- The Hills Development Control Plan 2012



**Planning,
Industry &
Environment**

Map produced by Department of Planning, Industry & Environment 30 July 2019

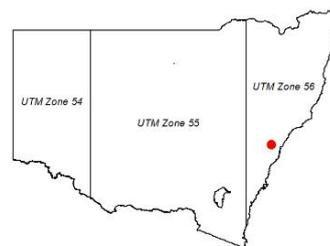
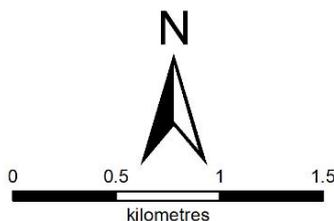


Figure 1. Location of NSW Government monitoring bores and private bores across the Maroota area relative to quarrying activities and the Maroota Tertiary Sands Groundwater Source