

Introduction

This report is a continuation of a series of quarterly public reports compiled by the Department of Environment and Natural Resources (DENR). The Code of Practice: Onshore Petroleum Activities in the Northern Territory (the Code) (2019) requires six months of baseline monitoring of groundwater at a well site prior to undertaking hydraulic fracturing activities. This report presents results of ongoing groundwater monitoring undertaken by Santos at its well sites in the Beetaloo sub-basin in compliance with the Code. The report includes updated ongoing groundwater monitoring data for the control monitoring bores (CMB) at the Tanumbirini and Inacumba petroleum well site on EP161 and groundwater monitoring data for the newly constructed impact monitoring bore (IMB) at the Tanumbirini well site (Figure 1).

Groundwater Monitoring Program

Interest holders are required to submit groundwater monitoring data quarterly, in compliance with the the Code. DENR has committed to publishing the monitoring results from interest holders to increase the transparency of monitoring and reporting of groundwater potential impacts by the onshore gas industry in the Northern Territory.

The Santos groundwater monitoring program consists of:

- Control Monitoring Bore (CMB), which is located “upstream” and within 100 m of each planned or existing petroleum well pad, screened across the Gum Ridge aquifer and a separate CMB screened across the Anthony Lagoon aquifer in compliance with the Code; and
- Impact Monitoring Bore (IMB), which is located 20 m “downstream” of the location of the petroleum well(s).

These bores enable an ongoing comparison of the groundwater upstream and downstream of the petroleum well, to allow for an immediate identification of any variation in the groundwater that can be directly related to the petroleum activity.

Groundwater quality

At both the Tanumbirini and Inacumba petroleum well sites the regional Cambrian Limestone Aquifer (CLA) system consists of only the Gum Ridge aquifer. This karstic aquifer is used as a source of groundwater by pastoralists and regional communities. A groundwater extraction licence (GRF10280) has been granted to Santos for extraction of up to a total of 190 ML per year from the Gum Ridge aquifer across its exploration permit areas in the Beetaloo sub-basin. At the Tanumbirini well site both a control monitoring bore (CMB) and an impact monitoring bore (IMB) have been constructed. The approved hydraulic fracturing of the vertical Tanumbirini-1 petroleum well was completed in November 2019. At the Inacumba well site the drilling of the approved Inacumba exploration petroleum well had not yet commenced during the monitoring period (Dec 2018-Dec 2019). An IMB has not yet been installed at Inacumba.

Groundwater monitoring results at Santos Tanumbirini and Inacumba well sites in the Beetaloo Sub-basin

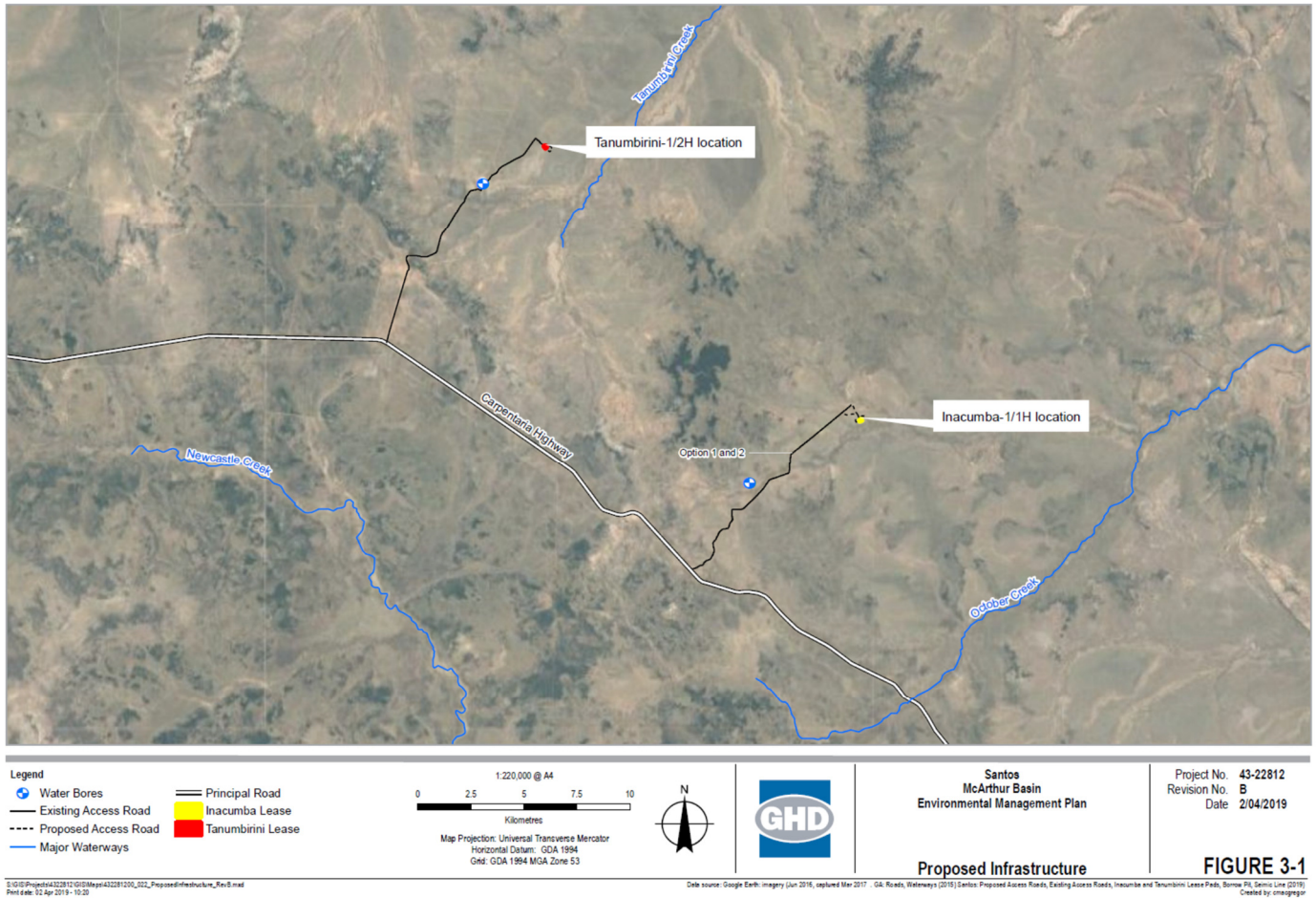


Figure 1: Santos Tanumbirini and Inacumba well sites on Exploration Permit (EP) 161 area in the Beetaloo sub-basin (courtesy: Santos)

Summary and Interpretation of Results

The chart below (Figure 2) below provides a time series of ongoing monitoring results for electrical conductivity (E.C.) and water level logger data for Tanumbirini and Inacumba well sites from Dec 2018 to March 2020.

E.C. in the IMB at the Tanumbirini site has remained consistent with E.C. in the CMB following hydraulic fracturing (H.F.), indicating that groundwater quality has not been impacted by project attributable activities at this wellsite location.

The change in standing water levels that can be observed at is due to pumping activities both in the monitored bores and from nearby bores. These variations are relatively minor and overall water level is considered reliable.

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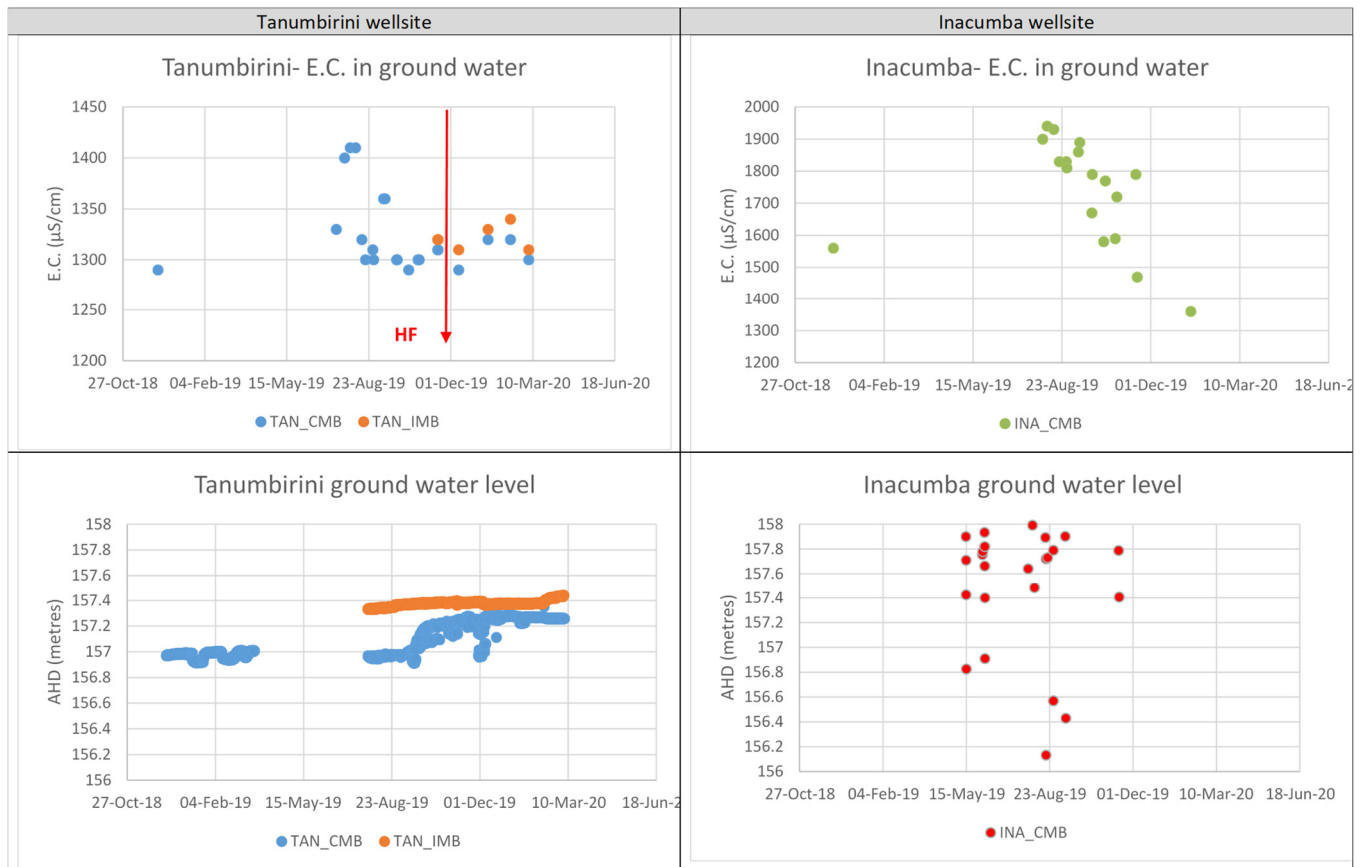


Figure 2 Water quality time series extrapolation

Conclusion

In accordance with the Code and Ministerial condition of approval of the EMP, results of ongoing groundwater monitoring must be provided by Santos every quarter for three years from the approval date of the EMP (2019). This data will be reported and published on the DENR website as they become available.