

# SEA WATER INTRUSION

Vs 1 – Feb 2020

*This Factsheet is one of a series<sup>1</sup> about Fox Resources' application for a Mining Development Lease in the area shown below.*

## Summary

A proposed coal mine near Bundaberg is posing a serious risk of causing seawater intrusion in the *Kolan Burnett A Subarea of the Coastal Burnett Groundwater Area* (see diagram). That will potentially render much if not all the ground water from Sharon to Avondale and out to the beach too salty to use for irrigation or town water.

## Coal mines and groundwater

The application for a Mining Development Lease (MDL 3040) by Fox Resources (Fox) is for coking coal (see<sup>1C</sup>). The coal is found in the Burrum Coal Measures, about 40m below the surface.

Given the shallow depth and the structure of the rock formations above it, mining is likely to be by open cut. This removes the overburden across a wide section and the area mined moves forward following the coal seams. Over the life of the mine, this creates a wide and deep trench which can stretch for 20 or 30km. This trench will cut through all layers above it, including aquifers.

An underground mine will need costly ongoing dewatering. Due to the shallow depth and the porous layers above, water from the aquifers will enter the mine. Both mining methods are likely to lead to seawater intrusion into aquifers.

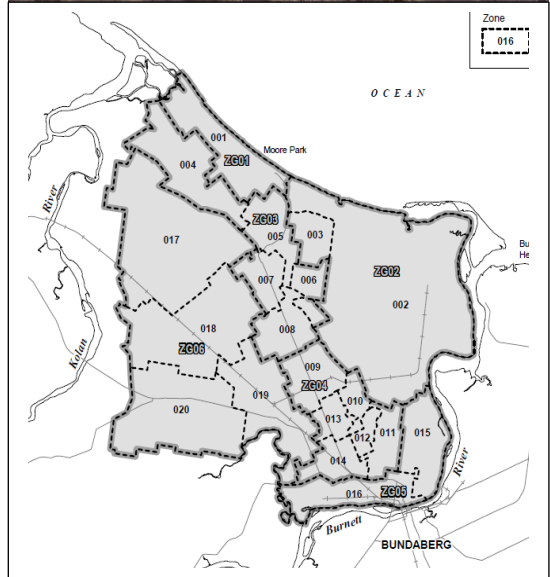
## Protecting Bundaberg groundwater from seawater intrusion since 1970

Water is the lifeblood of this agricultural area. Amongst the layers above the Burrum Coal Measures are the Elliott and Burrum aquifers. These provide irrigation water to 427 monitored bores and many non-monitored bores, as well as town water to Bundaberg.

Aquifers slope down towards the sea and continue out under the sea. Rain enters the aquifers and water moves slowly downwards to the sea. As more bores are sunk and more water is pumped out than rain provides, the levels in the aquifers may be drawn down to below sea level. This would cause sea water to seep into the aquifers and the water bores, making the water too salty for irrigation and domestic use.

Fifty-five years ago, this was recognised when seawater started to intrude and bores turned salty. The Monduran dam was built and an extensive monitoring program was started. This program has now 650 monitoring bores across the Burnett basin.

Based on this, the Bundaberg Sub-artesian section of the Coastal Burnett Ground Water Management Scheme was created in 1970. This is now the '**Water Plan (Burnett Basin) 2014**' and comes under the Queensland Water Act 2000. It is administered by the Department of Natural Resources, Mining and Energy from its Bundaberg office.<sup>2</sup>



Source - Kolan Burnett A Subarea of the Coastal Burnett Groundwater Area - Water Services, Department of Natural Resources, Mines and Energy, Bundaberg

<sup>1</sup> A) *Stop a coal mine next to Bundy* - B) *About Fox Resources* - C) *Coking coal on its way out*. Find these at <http://repowergladstone.com.au/factsheets/> or [https://www.lockthegate.org.au/fact\\_sheets](https://www.lockthegate.org.au/fact_sheets)

<sup>2</sup> Water Services, Department of Natural Resources, Mines and Energy, Bundaberg. Phone: 4131 2374 Email: [waterservices.bundaberg@dnrme.qld.gov.au](mailto:waterservices.bundaberg@dnrme.qld.gov.au) Website: [www.dnrme.qld.gov.au](http://www.dnrme.qld.gov.au) or [www.business.qld.gov.au](http://www.business.qld.gov.au)

The plan aims to maintain water levels in the aquifers high enough to stop seawater coming in. That means balancing water coming into the aquifers with water taken out. The water levels further inland are maintained at higher levels than those closer near the sea to ensure a constant flow downwards and maintain enough pressure to keep seawater out.

This balance is measured by monitoring the water levels in 650 purpose-built water level monitoring bores. To maintain the balance, users of water bores are allocated annually announced entitlements. There are some 750 ground water entitlement holders, mainly for agriculture, plus town water supply for Bundaberg city and surrounds.

The data can be found on Queensland Globe (<https://qldglobe.information.qld.gov.au>)

For those familiar with Qld Globe: Open it and go to: Layers > Add layers > Groundwater > Groundwater Monitoring > Current water level water monitoring bores.<sup>3</sup>

In addition to the water levels, water quality is also monitored, including salinity.

### **Effects of a coal mine: cutting off and reversing waterflows.**

One effect of a long deep trench cut through aquifers, or long wide roadways just below them, is to cut off water that flows from higher area to lower areas. It finishes up in the pit or the roadways. A likely second effect of the likely depth of the pit and the relative flatness of the area, is that downstream water may reverse direction and also be drawn into the pit or roadways. If existing entitlement holders continue to pump to make a living, the water levels in the aquifers are most likely to be drawn down so far that seawater will come in. The outstanding results of 55 years of protection are then likely to be destroyed and the high-quality irrigation and town water in this area is likely to be gone forever.

### **Recycling mining water not an option**

Mining companies elsewhere have promised to make water drained from the pit available to farmers by pumping it back into aquifers. However, water from similar coal mines is contaminated with toxic BTEX chemicals and heavy metals. Using contaminated water will damage the 'clean and green' image of local produce. Using it over any length of time will lead to a build-up of the levels of pollutants to unacceptable levels.

### **Environmental effects**

Environmental effects of dust blowing from mountains of loose material and contaminated water flowing from the Kolan river into the ocean are self-explanatory. The effects of huge coal-dust spreading trucks, trundling to and from Bundy Port via Quay street and across a load-limited bridge, are also self-explanatory. Fox has dismissed this and other issues by promising '*community consultation and negotiation with all relevant stake-holders*' and '*If a mining lease is applied for ... all environmental issue will be addressed at that time.*'

### **Granting MDL 3040 will lead to serious economic and social damage**

Fox has applied for a five-year term for MDL 3040. Under current legislation, this licence can be extended for another five years. This creates much uncertainty about the future of water supply and the general environment. Irrigation water is already under threat from the effects of the Paradise dam problems, where some 2.4 billion dollars may be at stake<sup>4</sup>.

Uncertainty scares away new capital investments and permanent jobs. It reduces current market values of investments in agriculture, tourism, retirement and homes, and causes emotional stress. Given the permanent destruction caused by any form of coal mine, and the status of Fox Resources as a company without assets or staff, **this MDL must not be approved**. The relevant minister, Dr Lynham, has discretionary powers under the Water Act and the Mining Act to refuse approval. Bundaberg has enough uncertainty already.

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<sup>3</sup> The Cone of Influence:

[http://cdn-au.mailsnd.com/10415/QFAS\\_jFamwzkGhrrw9blfhrvVJlShof4KrWsa5eLe8/2995056.pdf](http://cdn-au.mailsnd.com/10415/QFAS_jFamwzkGhrrw9blfhrvVJlShof4KrWsa5eLe8/2995056.pdf)

<sup>4</sup> <https://www.bundabergnow.com/2020/02/24/2-4-billion-cost-to-economy-if-paradise-dam-not-fixed/>