

Submission  
No 109

**INQUIRY INTO CURRENT AND POTENTIAL IMPACTS OF  
GOLD, SILVER, LEAD AND ZINC MINING ON HUMAN  
HEALTH, LAND, AIR AND WATER QUALITY IN NEW  
SOUTH WALES**

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Partially  
Confidential

# **Submission to NSW Parliament Legislative Council Enquiry**

## **Select Portfolio Committee No. 2 – Health**

Inquiry into current and potential impacts of gold, silver, lead and zinc mining on human health, land, air and water quality in New South Wales

Submitted by: PFT Agriculture

### **Terms of Reference:**

This submission by PFT Agriculture seeks to make its representations in relation to the following paragraphs of Section 1;

(b) the impact on catchments and waterways, affecting both surface and groundwater destined for, local and town water supplies, including rainwater tanks, and on aquatic biodiversity

(c) the impact on land and soil, crops and livestock, including through biomagnification and bioaccumulation

### **PFT Agriculture Background Information:**

PFT Agriculture is a family owned (Ian and Pru Pearce) agricultural business located at “Stoneleigh” 755 Ophir Road Orange NSW 2800 that produces apples for the domestic market, cherries for domestic and export sale, and beef cattle. Members of our family have operated fruit growing businesses in this locality continuously since approximately 1920.

The horticultural business produces apples and cherries (a total of approximately 15 planted hectares) – all of which are irrigated either with undertree microsprays (3.15 ha of cherries) or drip irrigation (the remaining apple and cherry orchard area).

Access to a secure water supply is essential to ensure the viability of the business. Family fruit growing businesses have accessed irrigation water from Summer Hill Creek continuously since 1981. PFT Agriculture accesses irrigation water through an irrigation licence for 73ML sourced from Summer Hill Creek. Irrigation water is also sourced from licenced irrigation bores. The integrity of these two water sources is essential to the long-term viability of the PFT Agriculture business.

In addition to irrigation water sourced by PFT Agriculture, the neighbouring orchard business operated by [redacted] also sources water from Summer Hill Creek through a 138 ML irrigation licence.

More detailed information on the PFT Agriculture business and impacts on it are contained in Annexure 1.

### **Submissions relating to Section 1 Subsection (b)**

PFT Agriculture believes that there has been a significant impact of the Newcrest Cadia mining operations on a number of local catchments and waterways. Whilst there has been a significant level of extraction by Newcrest in the Cadia Angullong and Belubula and surrounding catchments, there has also been a dramatic effect of Newcrest operations on flows in the Summer Hill Creek catchment to the North of Orange.

## **How Do Newcrest Extractions Impact the Summer Hill Creek Catchment?**

The Summer Hill Creek (SHC) catchment is impacted in two major ways by Newcrest extractions

1. Directly, through the Diversion of Treated Effluent from the SHC system to the Newcrest mine. Prior to the diversions to the Newcrest mine that commenced in 1998, treated effluent remained in the SHC system, supporting a vibrant riverine environment downstream of Orange (particularly the attractive and historic environments at the 4<sup>th</sup> Crossing, the Ophir Reserve and the Girralang Recreation Area downstream of Ophir.

In addition to flows for the environment and recreation areas, the diversion of treated effluent has dramatically reduced the water security of licenced irrigators such as PFT Agriculture and [redacted]. This has had a direct impact on the apple and cherry production of these businesses.

2. Indirectly, through the inability of Orange City Council (OCC) to access treated effluent to create recycled water to augment its potable water supply – hence causing OCC to seek to extract even more water for its potable water supply from the SHC system through infrastructure such as the current Storm Water Harvesting scheme and the proposed East Orange Wetlands Harvesting scheme. These additional OCC extractions (current and proposed) are a major impact on the SHC system. Further, unless the OCC agreement with Newcrest is terminated or amended, the treated effluent portion of the additional OCC extractions will end up being diverted to Newcrest. This will further exacerbate an already dire situation for Summer Hill Creek.

## **How Significant is the Diversion of Treated Effluent to the Newcrest Mine?**

Each day OCC extracts and treats in the vicinity of 8-10ML of water from Suma Park Dam to meet the potable water demands of the City of Orange, the variation due to changing seasonal demands. Of this 8-10ML daily extraction, approximately 80-90 % (ie approximately 6.5-9.0 ML/day) ends up as treated effluent that is diverted to the Newcrest mine.

The actual amount transferred to Newcrest does vary depending on seasonal conditions – in wet periods less effluent is supplied to Newcrest as its on-site storages can be full, but in dry periods the transfers are in full effect. The impacts of the treated effluent diversion on the Summer Hill Creek catchment and associated waterways are therefore more pronounced in drier periods. This more pronounced effect of effluent diversions during dry periods also applies to the aquatic biodiversity and the general health of the riverine environment in the Summer Hill Creek system below the First Crossing.

In the case of the PFT Agriculture and [redacted] businesses, the much lower flow levels in Summer Hill Creek due to effluent diversions impact their ability to access adequate water for use in the production of apple and cherry crops. Further detailed information on these impacts can be found in Annexure 1.

The total quantities of water extracted and used in Orange, as well as the quantities of treated effluent diverted to the Newcrest mine are available through OCC records available on their website.

In effect, the Orange City water supply acts as a high security water supply source for the Newcrest mine, which will improve in both quantity and security as OCC seeks to make additional extractions from the SHC system. The actions of OCC and Newcrest have been to the detriment of the Summer Hill Creek system downstream of Orange, with significant impacts on the quantity and quality of flows and the aquatic biodiversity in the waterway.

The diversion of treated effluent has also had an impact on the potential increase in the bioaccumulation of pollutants in Summer Hill Creek, particularly in dry periods. Low flow levels due to treated effluent diversion has meant that there is a lack of dilution of pollutants and a level of stagnation in creek ponds in dry times. In the recent dry period in the Summer of 2019/20 water quality in all reaches of Summer Hill Creek below Orange was compromised. This was particularly noticeable at the popular Ophir Reserve recreation area.

Further, the diversion of treated effluent transfer to the Newcrest mine has had a significant impact on the net result of the Cumulative Extractions from the Summer Hill Creek system. This effect can be seen in Annexure 2.

#### **Additional Points to Consider in Relation to the Impact of Mining Operations by Newcrest**

- **Lack of Consultation by Newcrest:** Prior to the diversion of treated effluent from the Summer Hill Creek system in 1998, there was no consultation or communication with irrigation licence holders on Summer Hill Creek. The authors of the EIS failed to adequately consider the potential impacts of effluent diversions on Summer Hill Creek. In fact, the EIS stated flow regimes would be in the vicinity of 10-12ML/day, whereas in reality there have been considerable periods of no flow in dry times.
- **Potential Impact of Underground Mining Operations on Subsurface Aquifers:** The underground mining activities of Newcrest have been shown to interact with underground aquifers in its direct vicinity as witnessed by the recent flooding of underground mining operations after an aquifer was unintentionally intersected when a ventilation shaft was being constructed. This is a cause of great concern given the potentially significant distances and linkages of underground aquifers. Many landholders depend on bores for their water security and therefore this issue needs consideration.
- **Use of Newcrest Mine Infrastructure for Orange Potable Water Supply:** In original EIS for the Newcrest Mine the water infrastructure of the mine was to be available for Orange City Water supply at the end of the life of the mine – then proposed as 12 years (approximately 2010). This did not happen as the mine life was extended with underground activities following the completion of original open cut project. Instead of being made available to OCC for water storage, the original open cut pit has since been used for tailings storage, rendering it unusable as a water storage resource.

## Annexure 1: PFT Agriculture Business – Background and Impacts of OCC Extractions and Newcrest Diversions

- The PFT Agriculture business has an irrigation licence (owned by Ian Pearce) from Summer Hill Creek for a total of 73ML. In addition to this licence, the Trust business operated by (on the adjoining Mirrabooka Orchard) access irrigation water through a licence owned by of 138ML. Water for the PFT Agriculture business is pumped from Summer Hill Creek during the Winter and Spring period each year and is stored in an on-farm storage dam and then pumped out onto the orchard during the growing season. The business operates in the same manner. In drier periods water from the Summer Hill Creek water source is more important to the sustainability of the business as water from the bore aquifer declines – typical of underground aquifers in the Orange district. In dry periods the PFT Agriculture and orchard businesses need permanent access to irrigation water from Summer Hill Creek to sustain their production base.
- The orchard operated by PFT Agriculture is a permanent horticultural planting of approximately 15 planted hectares. Irrigation water from Summer Hill Creek is critical for not only current production, but also to keep trees alive for years of production into the future. Lack of water will not only lead to short term production decline and financial impact, but also on the trees which may result in long term impacts on production or even tree death. The business will not recover if trees were to die from lack of water. Modern high density apple trellis systems are planted at around 2,900 trees/ha on dwarfing rootstocks and require irrigation each second day (and daily in peak demand periods). They do not tolerate dry conditions. The replacement cost for high density apple trellis systems is in the vicinity of \$160,000/ha. Considerable investment has been made in recent years on the basis of a secure irrigation water supply from the Summer Hill Creek water system.
- The 138ML licence for orchard has been in use since 1981. At the time the licence was issued, flows in SHC were in the order of 12-14ML/day all year round – a large portion of which emanated from treated effluent releases by OCC. The development and phasing in of the Newcrest Cadia gold mine led to OCC supplying it with virtually all the grey water from Orange, with the result that SHC dried up above Third Crossing in the first summer after the mine commenced operations. **There was no direct consultation with licence holders prior to this action by OCC.** Stage 1 Storm Water Harvesting has further compounded the effects of effluent diversion, with the result that SHC now experiences considerable periods of very low flows.
- Most probably as a consequence of climate change, but also probably the underground mining activities of Newcrest, there appears to be an ongoing decline of underground bore aquifers. This is leading to a situation where **the orchard businesses are becoming increasingly reliant on the Summer Hill Creek water source to irrigate orchard plantings.**

- The orchards on both [redacted] and Stoneleigh have been in **continuous operation for approximately 110 years**. In the 2019-20 growing season the PFT Agriculture business was forced to sacrifice (no fruit picked at all) 1.87ha out of 7.14ha of Galaxy apples, a direct loss of 26.2% of area, plus significant yield loss and quality impacts on the remaining 5.27ha of the Galaxy apple variety. This was due to the inability to access adequate irrigation water due to very low to no-flow periods in SHC in the summer of 2019-20. The uncertainty of obtaining irrigation water from SHC arising from the OCC application to rescind the flow rules for Stage 1 SWH meant that decisions had to be made early in the season to prioritise varieties and blocks to be irrigated. Submissions made to DPE by the Summer Hill Creek Care group relating to the above applications provide details on the duration of no-flow periods in SHC in this period.
- It should be noted that the orchards are **perennial plantings**, and as such it is not possible to rapidly change from one horticultural product to another as is the case with annual crops. Additionally, newer plantings of trees are based on intensive planting regimes with **dwarfing rootstocks that are far less tolerant of dry conditions** than traditional older production systems.
- Further, it should be noted that PFT Agriculture has enquired of the relevant authorities as to whether it can increase the size of on-farm storage dams to improve water security in dry years. It has been advised that this is not possible.

## Annexure 2: A history of Infrastructure and Diversions from Summer Hill Creek and Blackmans Swamp Creek and Their Cumulative Impact

- 1890 - Gosling Creek Reservoir constructed, capacity 524 megalitres (ML).
- 1918 - Lake Canobolas (formerly known as Meadow Creek Dam) completed 18 years later, capacity 567 ML, increasing Orange's water storage capacity by 108%. Note: this dam is in the Bell River catchment, not Summer Hill Creek catchment.
- 1918 - Orange's sewage scheme and treatment plant also commissioned in 1918 with associated increased water demand. Regular discharge (return) of treated effluent to Blackmans Swamp Creek/Summer Hill Creek commenced.
- 1931 - Spring Creek Reservoir completed 13 years later, capacity 2,700 ML, increasing Orange's water storage capacity by 247%.
- 1947 - Spring Creek Reservoir wall raised 16 years later, adding 1,749 ML, new capacity 4,449 ML. An increase of 46% in Orange water storage capacity.
- Suma Park Dam completed 15 years later in 1962, capacity 17,290 ML, increasing Orange water storage by 348%. Note: Lake Canobolas decommissioned in 1957, Gosling Creek Reservoir decommission in 1962. **Both now used for recreation purposes.**
- 2016 - Suma Park Dam wall raised one metre, **54 years** after the dam's opening in 1962 increasing Orange's combined water storage capacity by just 8%. The raised dam height increased its ability to capture more flow from Summer Hill Creek above Suma.

Other recent developments in water diversions in the upper Summer Hill Creek catchment:

- 1998 – Under contract, Orange City Council commenced transfer of Orange's treated effluent to Newcrest's Cadia gold mine in lieu of discharging (returning) to Blackmans Swamp Creek/Summer Hill Creek system. **The scheme diverts on average of 8 ML/day** (or up to 12 ML/day) from the Blackmans Swamp/Summer Hill Creek system. On average, this diversion means that **approximately +/- 85% of water extracted from Suma Park Dam ends up at the Newcrest Cadia gold mine.**
- 2009 – Blackmans Swamp Creek Stormwater Harvesting Scheme (BSCSHS) commissioned, extracting water from Blackmans Swamp Creek above its confluence with Summer Hill Creek and transferring this water to Suma Park Dam. **Effectively expanding the catchment** of Suma Park dam into the catchment of Blackmans Swamp Creek.
- 2009 - BSC Stormwater Harvesting Scheme's **Holding Dam constructed** on unnamed tributary of Blackmans Swamp Creek, capacity 230 ML, also capturing incidental natural runoff from the catchment of this unnamed water course and further reducing flows to Summer Hill Creek.

There are also considerable unaccounted for cumulative water diversions from Summer Hill Creek:

- Incidental natural runoff captured in BSC Stormwater Holding Dam on unnamed tributary of Blackmans Swamp Creek. Previously contributing to flows down Summer Hill Creek.
- Evaporation losses from Council's four water storage impoundments. This evaporation loss is equivalent to around 20% of Orange's annual water demand and constitutes a further loss of water from the Summer Hill Creek system.
- Unlicensed (harvestable rights) hillside farm dams constructed in the catchment of Summer Hill Creek with rural land subdivision and development over many years.



Considered in isolation, a number of Orange’s water diversion initiatives from the Summer Hill Creek system might appear to have a negligible impact on the overall catchment. However, any new diversions must be considered in the context of all the **current high cumulative diversions** of water and loss of flow downstream below the urban area of Orange.

The impact of diversions has been highest since the diversion of treated effluent from the SHC/BSC system in 1998. This diversion occurred with **no consultation** process with downstream irrigators who rely on the SHC/BSC water source in dry periods.

The cumulative impact of the proposed EOHW on downstream stakeholders is highest when the SHC/BSC system and the PFT Agriculture and \_\_\_\_\_ businesses need water the most – that is in dry periods.