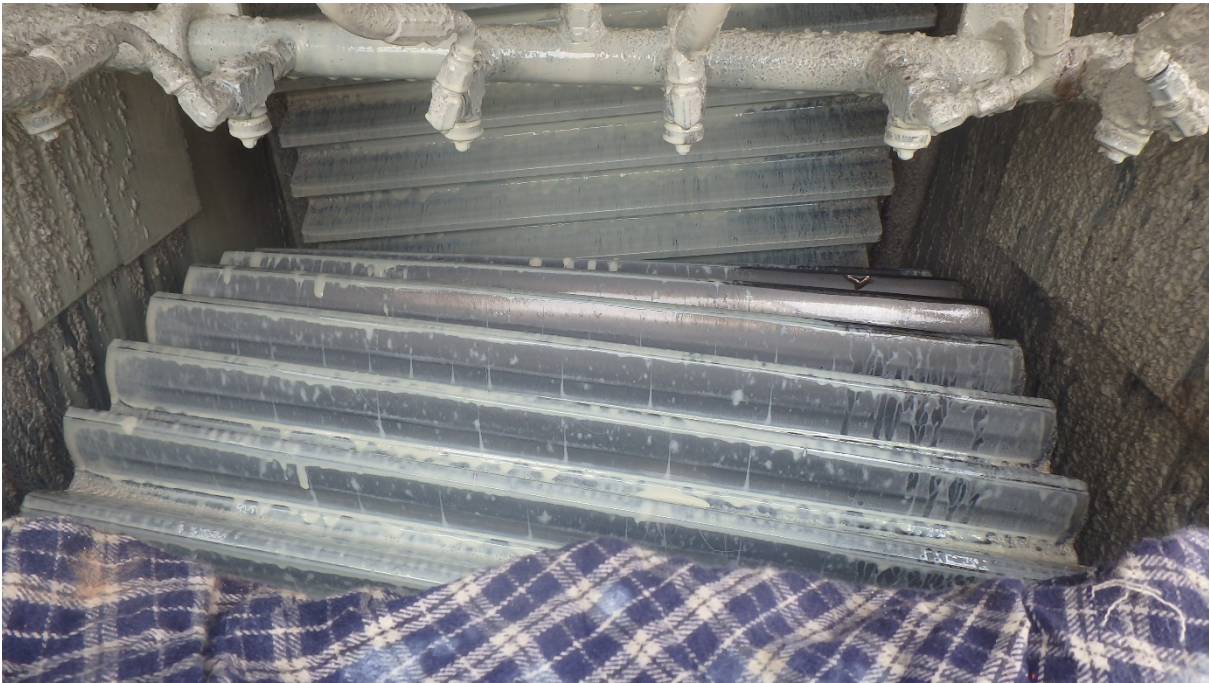




A GOLDMINE GOLD

A goldmine Gold Mine

Pinion Surface Remediation



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Client	A goldmine Gold	A goldmine
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1. Scope:

Gearinspec Pty Ltd was contracted to site at A goldmine Gold Mine to improve the contact area and load zone of the pinion gear by removal of a salient pitch-line.

2. Background:

The pinion gear had developed a protruding pitchline area due to contaminant ingress and abrasive attrition of the sliding regions of the pinion and girthgear. As the pinion is the harder of the two gears – the protruding section of the pinion depresses the corresponding area of the girth gear. The localized load concentration can cause enough stress in some cases to result in surface fatigue – specifically spalling.

The decision was taken to attempt to even out the load by removal of the protruding area.

No remediation was carried out on the girth gear during this outage.

Fig 1 actual 3-dimensional scan of the A goldmine pinion tooth before intervention

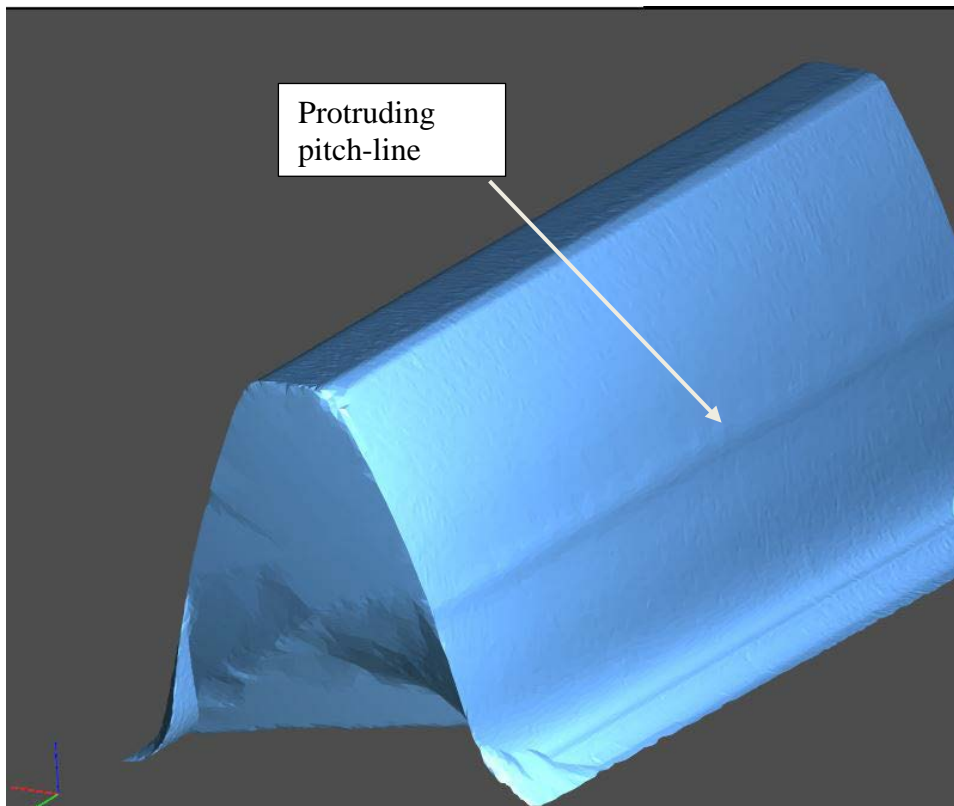
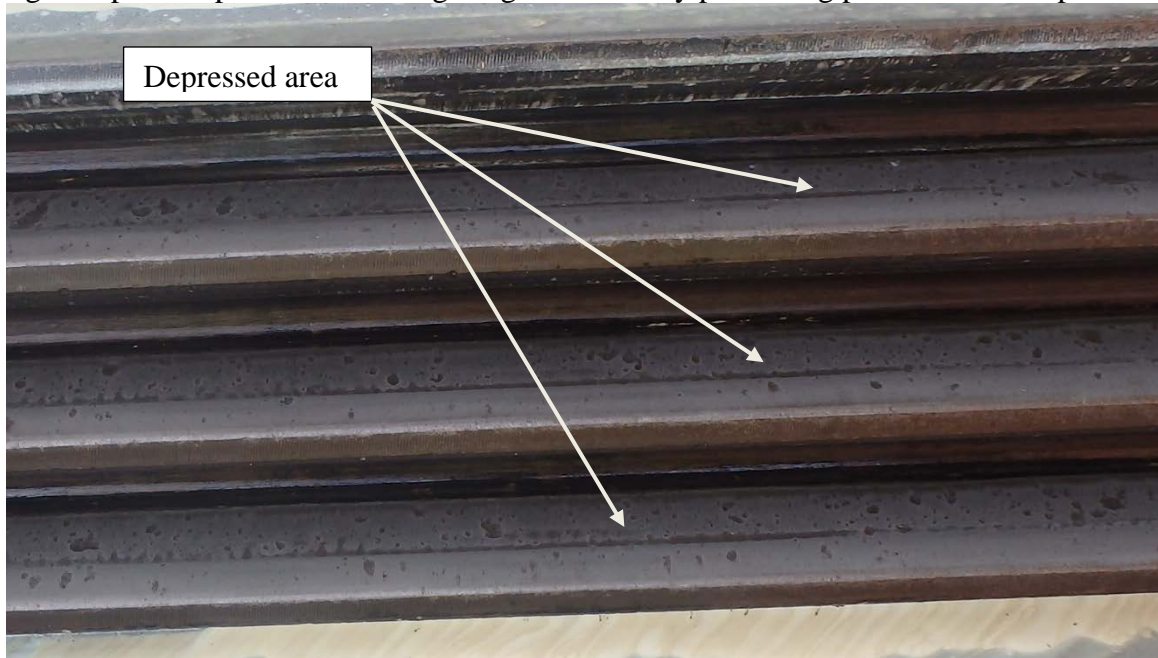




Fig 2 photograph of the pinion before intervention.



Fig 3 Depressed pitch-line on the girth gear caused by protruding pitch line on the pinion





3. Method:

The protruding area of each pinion tooth was removed by a 2 step process.

1. Removal of bulk material using a sanding tool with 36 grit paper
2. Smooth the area using an emery oil stone.

Fig 4 Sanding using a flexible backed sanding disc



Fig 5 Results:

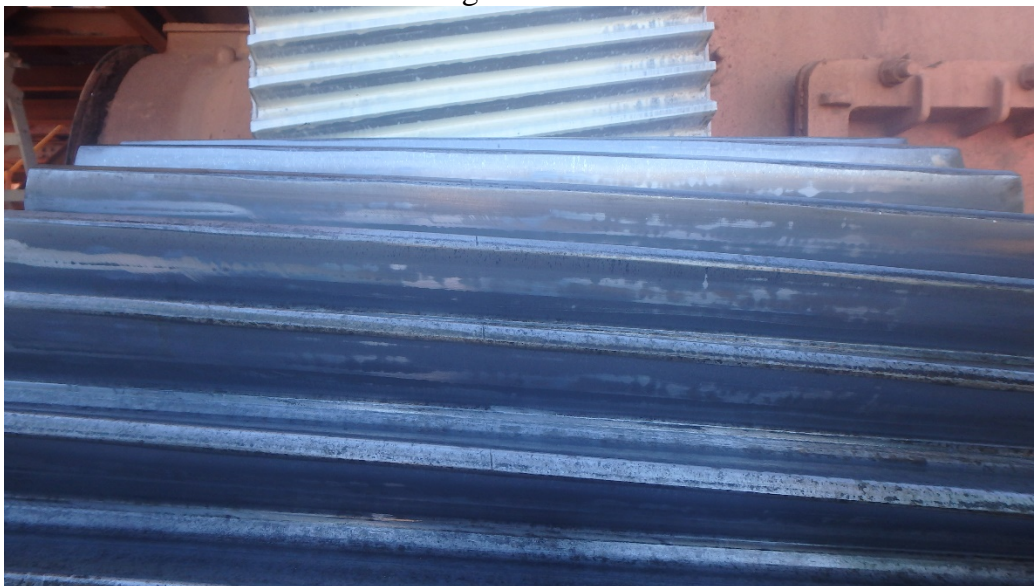
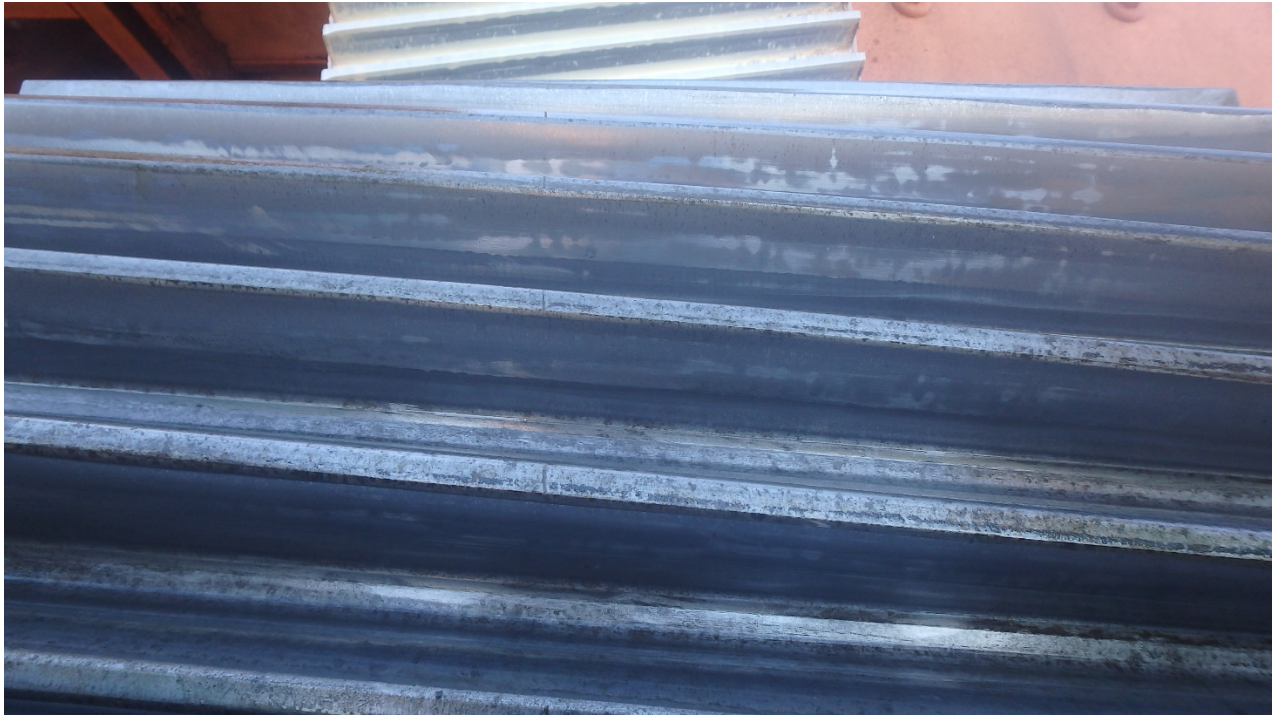




Fig 6 – shiny areas denote areas that stood out from the gear surface before intervention.



4. Critical Spares Strategy:

It was noted that there is a used pinion at site. It could be described as poor condition.

Fig 6 Pinion wear profile – the pinion has been used before – more worn on one side

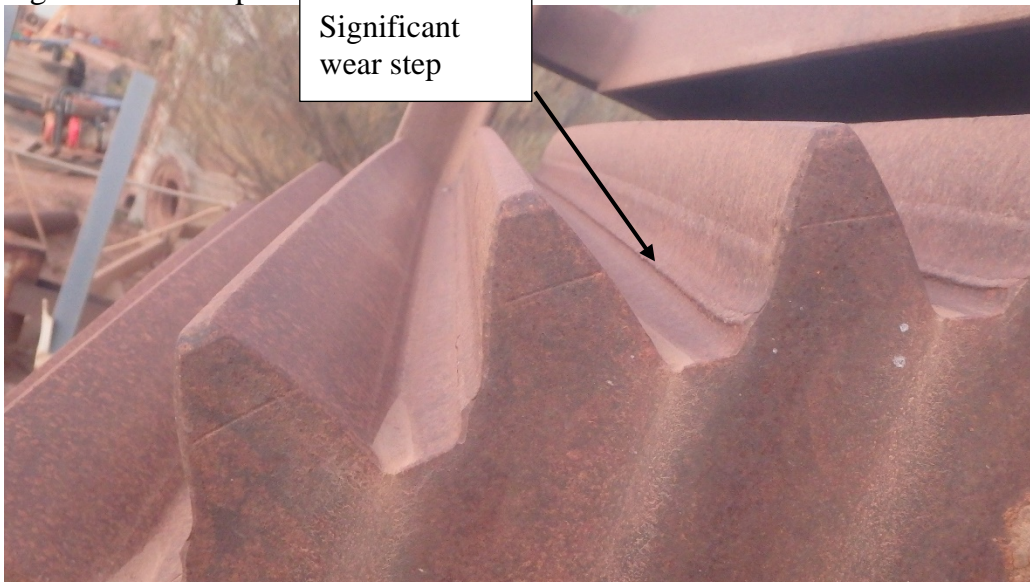




Fig 7 Pinion storage conditions



This pinion was obviously taken from service due to being significantly worn on one flank and it was obviously used on the other flank before being taken from service.

4.1 Recommendations:

1. Get a gear manufacturer or a specialist to measure the gear if the specific design details are not known.
2. Get a quote for the supply of a new pinion.
3. Clean up the existing used pinion; apply heavy duty corrosion inhibitor and store under cover.

4.2 Recovery strategy:

In the event of a sudden catastrophic failure of the current – in service pinion (a tooth breaks off or shaft snaps).

Use the “spare pinion” shown in Fig 7 to continue operation until a new pinion can be manufactured. The coupling is currently on the correct end of the shaft to make use of the less worn pinion flank.