

ANNEXURE 10

Effluent Disposal System Capacity Assessment

**prepared by
BPO Environmental Success**

**22, 24, 171 and 220
Bolong Road, Bomaderry**

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RE: Capacity assessment of ADI-BVF reactor

Dear Ming,

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Manildra is considering an expansion of the main factory in Nowra to process more flour. This expansion will increase the amount of wastewater generated at the site. Manildra is seeking a capacity assessment of the anaerobic ADI-BVF[®] reactor to treat the additional load.

Based on the information provided to BPO, it is estimated that the expansion will create additional 15-18% of load into the wastewater treatment plant with an average flow of 10,000 m³/d.

ADI-BVF[®] reactors are typically designed to operate at a Hydraulic Retention time (HRT) of 7-10 days and an Organic Loading Rate (OLR) of 0.5 – 1.0 kg COD/m³/day, depending on the digestibility of the feedstock.

The typical values for these two parameters measured at Manildra over the last 12 months are summarised below in Table 1. Table 1 also shows the new predicted process values. These are based on the assumption that the variability of the wastewater flows and organic load will remain the same after the expansion as it is now.

The performance of the ADI-BVF[®] reactor over the last 12 months has achieved 96% COD removal, which continues to outperform the design target of 90% COD removal.

Table 1: Current and predicted process parameters.

Parameter	Unit	Current Value	New Value	Design value
Flow	ML/d	8.4	10.0	9 – 12.8
HRT - Average	days	10.7	9.0	7 – 10
HRT - 90 th percentile	days	9.2	7.8	7 – 10
OLR – Average	kg COD/m ³ /day	0.6	0.7	0.5 – 1.0
OLR – 90 th percentile	kg COD/m ³ /day	0.9	1.1	0.5 – 1.0

Based on the predicted average loading values, the ADI-BVF[®] reactor will operate within the typical design range.

The 90th percentile of the Organic loading rate will be above the design range. The response of the reactor to peak loads will depend on the duration and the extent of the peaks. The above-design peaks at Manildra have predominantly been isolated events with less than 3 days duration. If this peaking nature is retained, then the digester is likely to handle the excess loads well.

Operation at a higher loading will require careful management of sludge inventory within the reactor so as to prevent solids carryover to the downstream membrane processes caused by an increased gas production.

The digester will also require an increased alkalinity supplementation in order to maintain optimum operating conditions within the reactor.

BPO recommends that process efficiencies within the factory are assessed and reviewed in order to identify the main sources of hydraulic and organic load peaks. The peaks can then be effectively managed by additional telemetry. This will reduce the risk of overloading of the ADI-BVF[®] reactor.

In conclusion, based on predicted average loading rates, the ADI-BVF[®] reactor will accommodate the increase in waste water volumes. During peak loads the reactor will require careful management to maintain optimum operating conditions for the biochemical reaction.

We hope the information in this document meets your immediate needs. Please do not hesitate to contact us if you have any questions or require further information.

Yours truly,



Alzbeta Bouskova

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cc. Sally Rosenberg – CEO, BPO Ltd.

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