

# Technical Memorandum

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## Additional Flow Path Status

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Australian Wetlands Consulting (AWC) have been requested to provide a summary and response on the status of the Additional Flow Path (AFP) in response to questions from Byron Shire Councillors.

The operational context for the AFP is currently being determined. Assessment of the minimum and maximum flowrates to both the Melaleuca irrigation area and wetland cells will be informed by the recently completed Byron Bay Integrated Water Management Reserve (BBIWMR) water balance model and monitoring improvements. The AFP will be operated in response to environmental conditions, in particular net rainfall.

### Acronyms

AFP - Additional Flow Path

ASS – Acid Sulphate Soils

AWC – Australian Wetlands Consulting

BBIWMR – Byron Bay Integrated Water Management Reserve

BGL - Below Ground Level

WSUD – Water Sensitive Urban Design

### Current Status of the AFP Project

The AFP has been constructed and work is currently in progress to establish the required monitoring network to manage the release of effluent.

The AFP is intended to be operated under dry weather conditions. It is essential that an understanding of current flow via the Industrial Estate Drain be compiled.

One water level logger has been installed at the Bridge in the Industrial Estate Drain and a review of the data and rainfall is planned for May 2023.

Three additional loggers are also planned to be installed. One logger in Cell J and two within the 24ha effluent irrigation area. Due to the remote nature of monitoring within the 24ha effluent some technical issues have arisen. These require collaborative work to establish a robust, direct remote feed to SCADA to inform site operations. Presently, an assessment of the suitability of the interface for the remote loggers with the SCADA network is underway.

### **AFP Key Performance Indicators (KPIs) and Operational Protocols**

As the operation of the AFP is intended to be a “dry weather” release a weather monitoring system is also required. The operation of the AFP will include a decision hierarchy for water use through the BBIWMR that supports effluent reuse, management of ASS, and wetland function for water quality treatment. No effluent is to be released via the AFP during rainfall events to prevent exacerbation of flooding within the Industrial Estate.

Effluent irrigation to the 24ha aims to achieve the following:

- Maximise effluent reuse
- Avoid surface ponding
- Manage ASS (allow for periodic high-water tables)
- Groundwater level needs to be maintained at >600mm Below Ground Level (BGL).

### **Monitoring and Evaluation Approach**

An assessment of the current flow conditions in the Industrial Estate drain is to be completed to understand current stormwater movement through the network. This will also be used to clarify potential flow scenarios through both the existing Upper Union Drain release and Additional Flow Path. The main influence on flows into and out of the STP is rainfall. During dry summer conditions it is thought that approximately a third of the flows could be released via the AFP. The flow delivered to the AFP may be higher in winter when there is less opportunity for evaporation via the wetlands and 24ha.

Water level monitoring in the 24ha should trigger irrigation when the water level is BGL. This may require some further refinement as water level at the surface for extended periods will be problematic for tree health. Operation of the effluent irrigation area also needs to ensure a resting period (no irrigation) during late winter/early spring i.e., no irrigation or reduced irrigation for a period of 60 days meanwhile ensuring that the water level does not drop below 600mm BGL. Some years may require reduced irrigation due to high rainfall in the catchment and as a result high water tables.

A minimum water level in Cell I and J of 150mm is also required.

## Finalisation of AFP Commissioning

An approach to the finalisation of the AFP commissioning is to undertake a staged and incremental approach to release effluent as outlined below. This will allow for monitoring and assessment of the overall system to ensure a precautionary approach is undertaken. Effluent release via the AFP will be incrementally increased (refer Table 1 below). The caveat being that release is dependent on weather conditions being “dry”. This approach would allow Utilities to test and respond to any issues.

**Table 1 - AFP regime**

Weeks	Flow rate
1-6	0.1ML/day
6-12	0.25ML/day
12-24	0.5ML/day
24-32	0.75ML/day
32 onwards	1ML/day

## Key tasks and dates

Task	Roles/notes	Timeframe
1. Review water level data at Bridge monitoring location	Planit to provide data, AWC review	8-12 <sup>th</sup> May
2. Review rainfall data and correlate with water level data	AWC review	8-12 <sup>th</sup> May
3. Finalise monitoring locations in 24ha and Cell I and Cell J	Onsite with Safe Group and AWC	TBC
4. Supply and install of monitoring loggers		TBC
5. Survey in monitoring locations		TBC
6. Calibration of loggers		TBC
7. Trial flow delivery to the 24ha effluent irrigation area. View outlets and release locations in the 24ha	AWC, SAFE Group	15-19 <sup>th</sup> May
8. Trial of low flow ADWF release to AFP	Commencing with 0.1ML/day in dry weather	End of June

## Gaps in knowledge and risks

- Due to the operational interconnectedness between the AFP and the BBIWMR (constructed wetlands and 24ha irrigation site), and the diverse (and sometimes competing) set of objectives these systems aim to deliver (e.g., reduce effluent discharge vs. maintaining groundwater levels for ASS management), it is paramount that operational and monitoring arrangements can respond to this complexity.
- As monitoring data becomes available and loggers are installed in the 24ha and Cell J, the AFP operational arrangements will likely undergo refinements to complete commissioning of the system.
- Incremental approach in release will allow managed testing of impacts of different volumes of effluent discharge into the drainage network. Of fundamental importance is understanding existing hydrology

of the drainage network to ensure release of water through AFP supports the delivery of intended outcomes.

- Functional specification – there are currently a number of gaps in understanding how the whole system is going to work. For example, there is also potentially a need for level loggers in current drainage network (EPA 4)
- Ultimately the monitoring should allow for real time data to be provided on water levels in all release pathways including the AFP, Southern Drain, Wetlands and 24ha.
- Maintenance of AFP drain network, including WSUD assets, is key in ensuring adequate system function. This is likely to require adequate coordination between Utilities and the Works department.