Belmont Drought Response Desalination Plant

Comments in response to the Environmental Impact Statement (EIS), Nov 2019

1. Project Objective

One of the two stated project objectives is to "slow the depletion of existing water storages in the event of an extreme drought". This is considered too general, almost aspirational. Inclusion of some metrics either as part of the objective, or directly linked to key performance indicators, would make the objective more meaningful, definitive, and outcome focused in measuring operational project success.

2. Plant Capacity

The EIS states that the 15ML capacity plant will contribute 10% to 15% of the total supply under level three water restrictions. The 15 ML produced is only 11% of the stated level three estimated daily consumption of 138,000 ML. This is not a significant contribution especially when comparing to other desalination plants in Australia. While a 30 ML capacity plant (ie 100% capacity increase on the proposed 15 ML) would be desirable, a 50% capacity increase to 22.5 ML would at least achieve a 15% to 22.5% contribution to the estimated daily consumption. This assumes that the outlet diffusers can accommodate an outflow of 65-70 ML (combined brine and waste water), and that the dry weather existing waste water arriving at the Belmont plant is 22.5 ML or greater to ensure that the treated combined effluent (brine plus waste water) has the same saline content as the seawater.

Increasing the capacity to 22.5 ML would increase the estimated project cost in the order of 35-40% to a total value of about $125M which is not unreasonable. A desalination project which delivers 10% or less of the total water supply needs to be questioned as to whether the benefit can be economically, socially, environmentally, and resource allocation justified.

3. Water Intake

The EIS recommends seawater intake from a sub-surface saline aquifer. The modelling for the preferred horizontal intake arms alternative provides a predicted large range of intake rates for both single "three arm" and "five arm" intake structures. No modeling was carried out for multiple three and five arm intake structures with the predicted outcomes somehow being extrapolated from the single structures' data. As the proposed design is based on two "three arm" structures, the degree of uncertainty in achieving the required intake is further compounded. From the analysis presented there appears to be significant risk in ensuring that the 15 ML intake will be achieved.

Adoption of the "open seawater intake" option would remove the intake risk and uncertainty associated with the subsurface seawater intake options, and also negate the need to rely on the recharging of the aquifer following the cessation of the desalination plant operation to be ready for future re-commissioning.

4. Plant Operation Power Supply

It is noted that wind turbine power generation was not considered as an option to supply the up to 5 MW capacity required. Consider the following:

- The Hunter Water population base is approximately 600,000 which is 7.5% of the NSW population of nearly 4M
- NSW current coal and gas power generating capacity is between 10,000 and 12,000MW
- On a per head of population basis, the Hunter Water serviced area accounts for 900MW of the NSW coal/gas sourced capacity (ie 7.5% x 12,000MW)
- The power required for the proposed desalination plant is 5MW or between 0.5% and 1% of the total Hunter Valley requirement

This is not an insignificant draw on a declining base source of non-renewable energy supply. Furthermore, new energy consuming infrastructure should be looking towards renewable energy sources, or at least be non-renewable energy neutral. This aligns with the imperative to transition from renewable to non-renewable energy together with the broader community expectation of private and public sector entities meeting their societal environmental responsibilities.

Construction of two (or possibly three if the desalination plant capacity is increased to 22.5ML) 2MW wind turbines at a suitable off-site location at a cost of say $3M each would only add $6-9M to the estimated cost of the project. This cost could be offset by selling the power generated back into the market when the desalination plant is not required.

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2 Dec, 2019