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Independent Pricing and Regulatory Tribunal
Po Box K35
HAYMARKET POST SHOP NSW 1240

14 March 2018

Dear Sir / Madam

RE: Issues Paper – Review of Water Utilities Performance Indicators

Introduction

The Independent Pricing and Regulatory Tribunal (IPART) is currently conducting a review of the performance indicators collected from public water utilities (PWUs) and the *Water Industry Competition Act 2006* (WIC Act) licensees, which IPART regulates.

The legislated responsibilities detailed in the *Fire Brigades Act 1989* pertaining to the protection of life, property and the environment mean that Fire & Rescue NSW (FRNSW) has significant community safety obligations. Many of these obligations are dependent on the adequate provision of water from reticulated water networks and, as such, FRNSW is a key stakeholder of the various NSW PWUs and *WIC Act* licensees.

FRNSW has considered IPART's 'Issues Paper relating to the Review of Water Utilities Performance Indicators' and welcomes the opportunity to provide comment. In formulating this response, the following documents have been considered:

- *A plan for growing Sydney*. NSW Government Planning and Environment.
- *Draft Greater Sydney Region Plan*. Greater Sydney Commission.
- *Compliance and Enforcement Policy*. IPART.

This submission makes specific comment on two questions asked in the IPART discussion paper. These questions are as follows:

- (4) *Do stakeholders agree that it is appropriate for water utilities providing the same service to be subject to the same performance indicators?*
- (13) *Do stakeholders agree with our initial view that there is no need for any additional performance indicators for water pressure?*

This submission addresses one of IPART's key items, that being '*understanding stakeholder views on the performance indicators they would find useful, the benefits and costs associated with them and our approach to collection*'.



FRNSW's submission provides an overview of the key issues FRNSW believes need to be understood by IPART when considering FRNSW comments on the performance indicators applying to PWUs and *WIC Act* licensees. These focus on the form of development being undertaken in Sydney (and more broadly across NSW) and the relationship between the performance of the reticulated water supply and the type of fire hydrant system installed in a Class 2 to 9 building.

Development and Water Supply Performance

1. A snapshot of development in Sydney

The Department of Planning and the Environment's *Metropolitan Housing Monitor* highlights the differing forms of dwellings currently being constructed within the greater Sydney region, these being multi-unit development and detached housing. The snapshots below highlight that multi-unit development is the dominant form of construction in the 'eastern city', the 'north district' and the 'south district', while detached housing is the dominant form in the 'western city'. Note: See Figure 1 to Figure 4 below.

These differing urban forms and the locations in which they're developed means that in most instances, multi-unit developments are undertaken on brownfield sites that are serviced by existing water infrastructure, while detached dwellings are typically built on greenfield sites serviced by new water infrastructure.

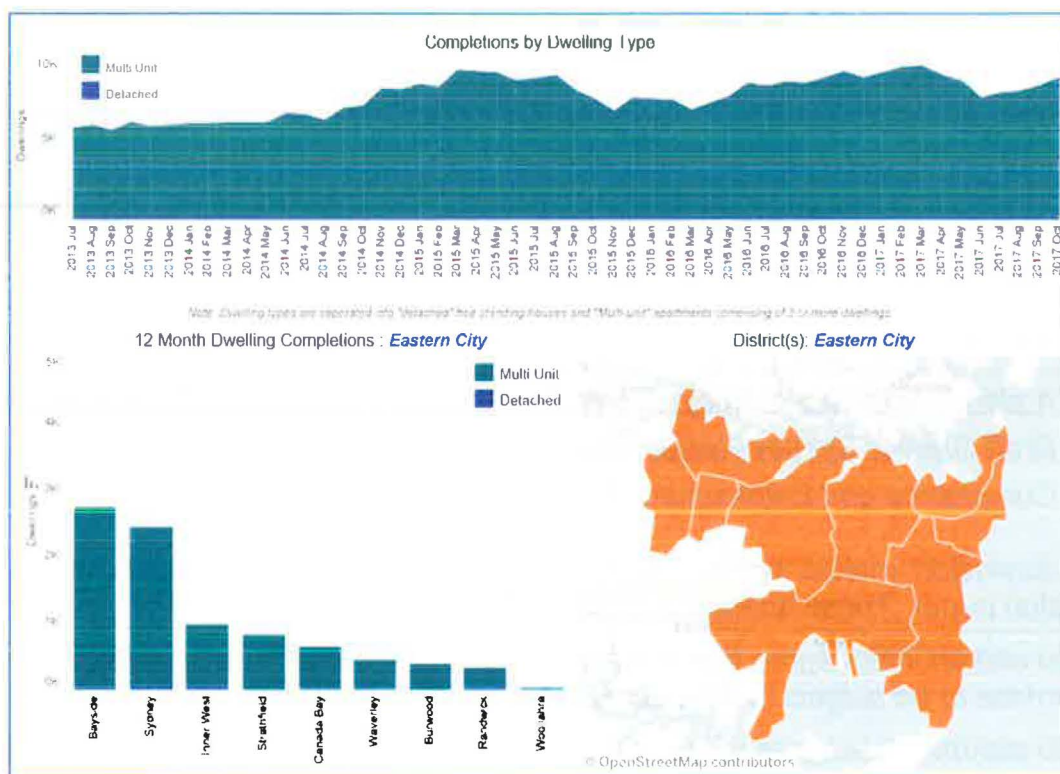


Figure 1 - Dwelling Completions: Eastern City

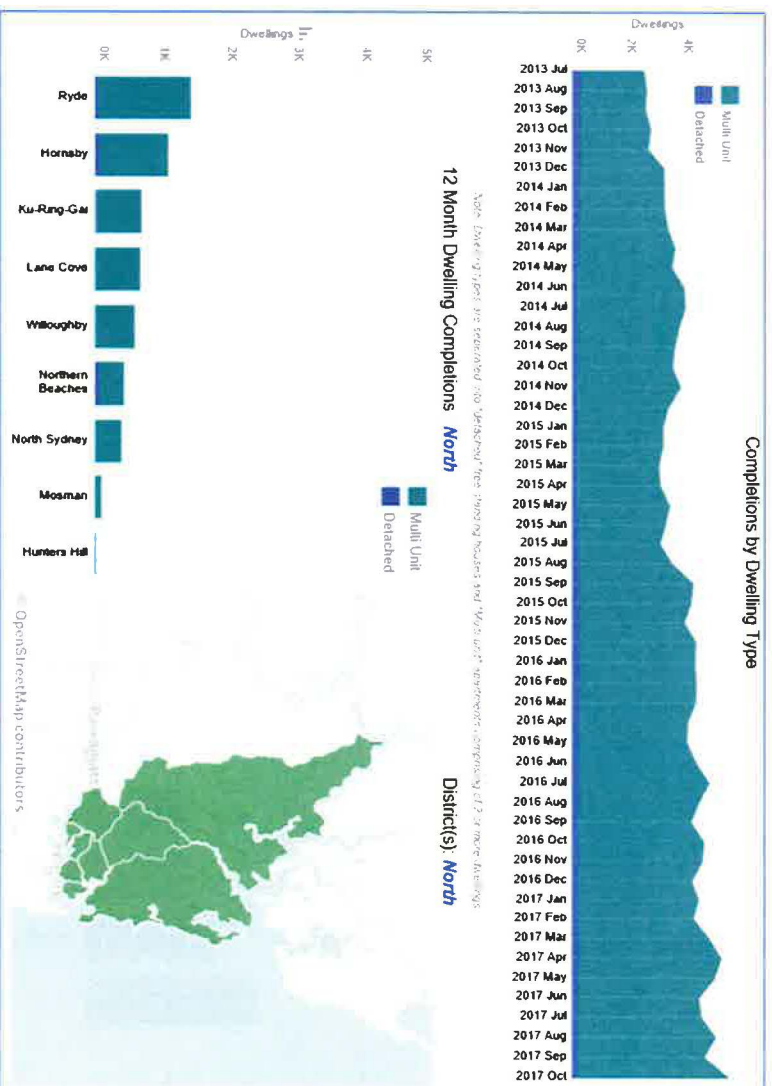


Figure 2 - Dwelling Completions: North District

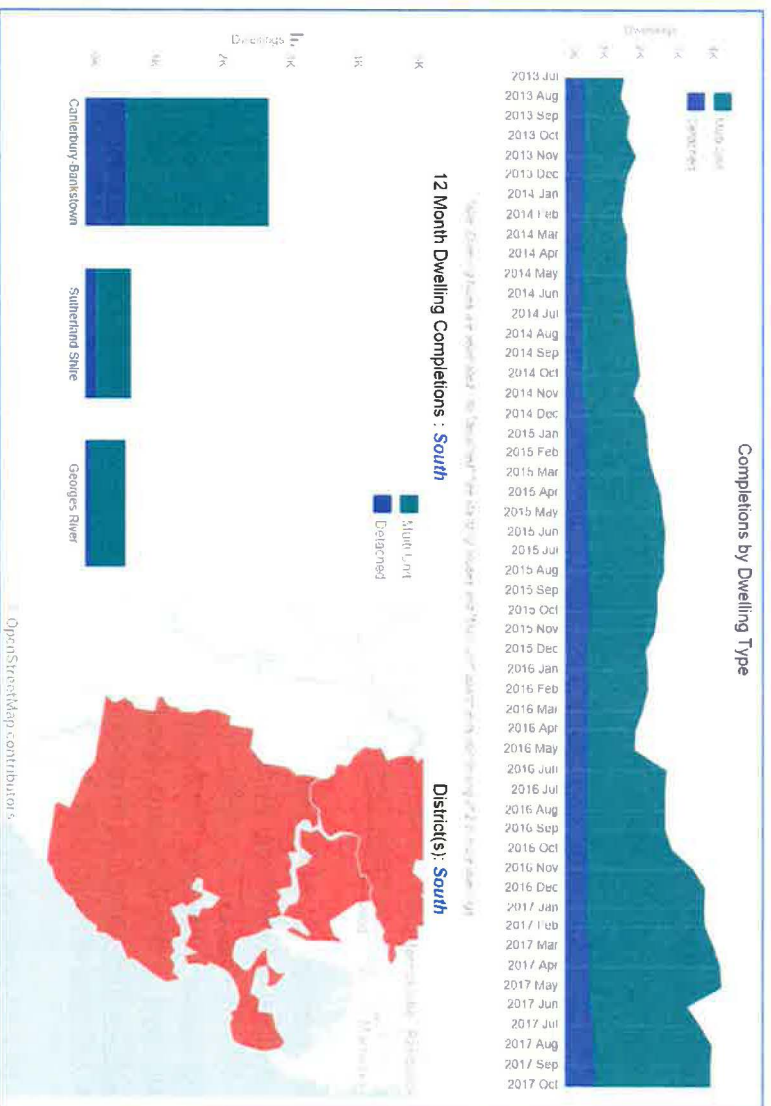


Figure 3 - Dwelling Completions - South District

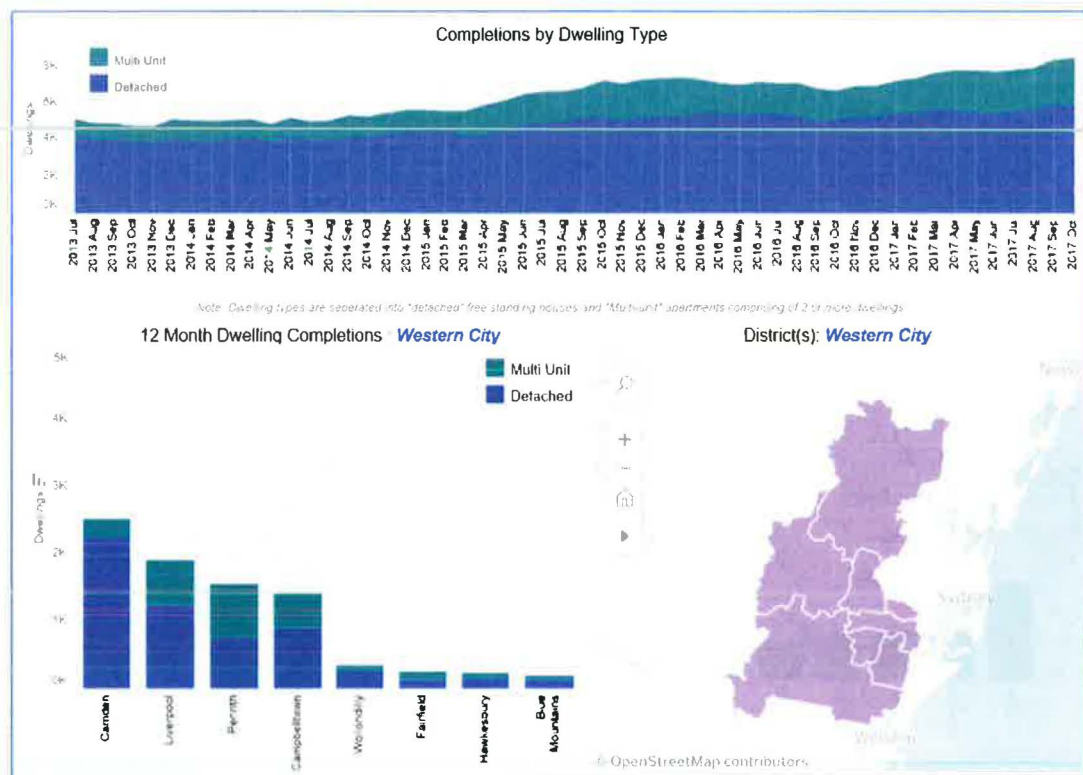


Figure 4 - Dwelling Completions - Western City

The implications of existing water infrastructure in brownfield sites serving multi-unit developments will be explored below.

2. The National Construction Code

Before the National Construction Code (NCC) can be applied in any state or territory, it is required to be referenced by that jurisdiction's legislation. In NSW, the *Environmental Planning and Assessment (EPA) Act and Regulation* are the enabling legislation.

The NCC is a performance-based code that contains all the Performance Requirements (PRs) for the construction of buildings. One of the ways to meet these PRs is to develop a Deemed-to-Satisfy (DtS) solution.

The DtS provisions of the NCC detail a prescriptive set of requirements for all building types, with each of these building types being provided with a classification (Class 1 to Class 10) by the NCC (refer to Appendix 1 for a detailed description of the various building classifications). The differing levels of fire protection detailed in the NCC can be attributed to the differing level of life safety risk associated with each building type. To highlight this variation, the fire hydrant system requirements for a detached dwelling (Class 1a) and a multi-unit development (Class 2) will be discussed.

Under the provisions of Volume 2 of the NCC, which deals with Class 1a and Class 10 buildings, no fire hydrant systems provisions are detailed. As such the detached housing currently being constructed throughout the areas serviced by the various NSW PWUs and *WIC Act* licensees would not be required to be provided with a fire hydrant system. Notwithstanding this, protection from fire for these dwellings is provided by the street hydrants installed on reticulated water networks.

Under the provisions Clause E1.3 of Volume 1 of the NCC, a Class 2 to Class 9 building with a floor area greater than 500 m² and where a fire brigade is available to attend is required to be provided with a fire hydrant system complying with the requirements of Australian Standard AS 2419.1. All of the multi-unit development complexes having a floor area greater than 500 m² currently being constructed in areas served by the various NSW PWUs and *W/C Act* licensees would be required to be provided with a fire hydrant system complying with AS 2419.1.

3. *Australian Standard AS2419.1 – Fire Hydrant Installations*

Under the provisions of AS 2419.1, fire hydrant coverage to a building may be provided from the available street fire hydrants and if this is not possible through the provision of an on-site fire hydrant system.

For low rise multi-unit developments, the desired hydrant solution is to provide fire hydrant coverage from the available street fire hydrants. Where this is not possible, an on-site solution is required. For mid- and high-rise multi-unit development, an on-site fire hydrant system is always required.

Where an on-site fire hydrant system is required, in all instances the cost of this system and therefore the cost of this aspect of development can be directly related to the characteristics of the nearest available town main. This is best understood by reviewing the underlying design principles in AS 2419.1. The simplified principles detailed in AS 2419.1 can be summarised as follows:

- where pressure is an issue, an on-site pump is required to be installed,
- where flow is an issue an on-site tank and pumps is required to be installed

Where on-site pumps or on-site tanks and pumps are required, the cost of installing a fire hydrant system increases significantly. In this regard, apart from the cost of having to install these items (significant in themselves), space within the development (net lettable area) is lost to accommodate an on-site tank and pumproom.

4. *Existing reticulated water supply infrastructure performance*

As indicated in Section 1, most new multi-unit developments in Sydney (and possibly across NSW) are being built on brownfield sites that would typically be served by existing water infrastructure. In this section, the factors influencing the performance of existing water infrastructure are discussed.

The current and future performance of existing water supply infrastructure can be attributed to the approaches taken by water agencies (such as Sydney Water) to extend the life of their existing water infrastructure and the demand (and increasing demand) being placed on this infrastructure by changes in state and local planning laws and increased population growth.

Across broad areas of the Sydney water network (and possibly throughout NSW) existing cast iron water mains, some of which were laid a century ago, have been lined with cement. FRNSW understands cement lining was undertaken to ensure cast iron mains would continue to be suitable for use with potable water and to extend the life of these mains. While these are considered positive community benefits, the problem of this approach has been that the internal diameter of these mains was significantly decreased and the 'roughness' of the internal lining of the pipe was significantly

increased. When taken together, these factors contribute to a decrease in the overall performance of these mains through a decrease in flow and loss of pressure.

More recently though, the favoured approach by Sydney Water (and it is assumed other water agencies) to extend the life of their existing infrastructure and possibly to meet water conservation targets is to reduce the pressure throughout their network to limit the number of pipe breakages. While the reduction in pipe breakages is again considered a positive community benefit, this approach also results in a decrease in overall network performance and the available pressure and flow.

The third factor significantly impacting on the performance of existing water supply infrastructure is the demand being applied to the system through changed planning laws and increased population growth. Figures 1 to 4 highlight the significant number of dwelling completions in the Greater Sydney area that are a direct result of changes to planning law and increased population growth. While other centres across NSW may not experience the same level of growth as Sydney, the implication for all existing water infrastructure, as with Sydney, is that where increased demand occurs over time there is likely to be a decrease in water supply performance.

5. Implications of existing water infrastructure performance

Due to an apparent disconnect between the rate of renewal of urban planning (rapid) and water agencies upgrading existing water infrastructure (slow), the implications of performance in existing and new developments will be looked at.

5.1 Existing development

For building owners of existing multi-unit dwellings (or other Class 4 to 9 buildings), any decrease in pressure and/or flow in the existing water infrastructure has significant implications for the 'wet fire systems' (fire hydrant or fire sprinkler system) that may serve their building. Depending on the issue and type of fire hydrant system serving the building, this may result in the building owner being required to install or upgrade an on-site fire hydrant system to include on-site tanks and/or pumps.

For buildings undergoing a fire safety upgrade due to Council issuing a Fire Order, FRNSW Fire Safety Unit now sees an increased number of instances where the nearest available town main has been unable to provide the required pressure or flow or any reasonable measure of flow and/or pressure to an existing building. For the building owners (and Council) to finalise this type of order, an on-site fire hydrant system incorporating on-site tanks and pumps would be required.

In Sydney, the 'Eastern City' and 'North District' are areas of particular concern for buildings requiring a fire safety upgrade, particularly where compliance with the NCC requirements for fire hydrants is sought. Statements of available pressure and flow from these areas have been included in Appendix B. For each of the statements provided, the design of an on-site fire hydrant system (as discussed in Section 3) would require an on-site tank and pump. Additionally, the on-site tank would need to have a large bore suction connection, which has implications for fire brigade intervention time.

An initial investigation by FRNSW at one location determined the more cost effective solution to limited pressure and flow in an existing town main was to upgrade the existing water supply infrastructure. This is better for building owners and the

community than the provision of an on-site fire hydrant system with tanks and pumps for each individual building in that location. Additionally, a fire hydrant system that more appropriately facilitated fire brigade intervention activities is more likely to be provided if the existing water supply infrastructure was upgraded.

For existing buildings, the other key question is where to put these additional items. Finding space to install of fire hydrants, fire brigade booster assembly, on-site pump or on-site tank and pumps, may be very difficult in an existing building.

5.2 New development

Many of the NCC compliance problems confronted by existing building owners in providing a fire hydrant system are also confronted by developers of new buildings. The major difference here, however, is that it's easier to find space for the installation of on-site fire hydrant systems. Costs associated with the installation of any on-site pumps or on-site tanks and pumps can be accommodated more readily through the transference of costs to the buyers of these properties. Despite this, any new building will eventually become an older building and will become subject to the performance (and possibly declining performance) of the nearest available town main.

FRNSW Operational Effectiveness

This section discusses the impact that the performance of a water network has on the operational effectiveness of FRNSW at extinguishing fires in multi-unit buildings.

As the property and life losses experienced by the community from fire can be related to the time taken for FRNSW to intervene, the importance of installing the most appropriate fire hydrant system to help minimise fire brigade intervention time cannot be overstated.

Under the provisions of AS 2419.1, two different forms of fire hydrant booster assembly are provided: one that enables the attending fire brigade to access the primary water supply using layflat 'soft' canvas hose; and the other requiring the use of 'semi-rigid' large bore hose (see Figure 5 and Figure 6 below). Booster assemblies that allow for the use of 'soft' layflat canvas hose are preferred, as they enable rapid connection to the booster assembly and minimise fire brigade intervention time. For this type of system to be installed, the nearest available town main would need to be able to provide the required flow and pressure.

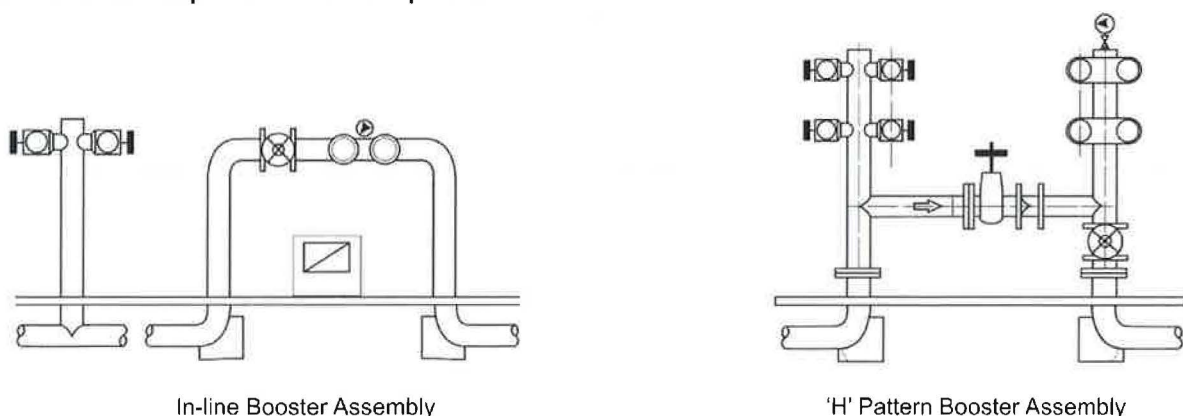


Figure 5 – Fire brigade boosters that provide for the use of layflat canvas hose

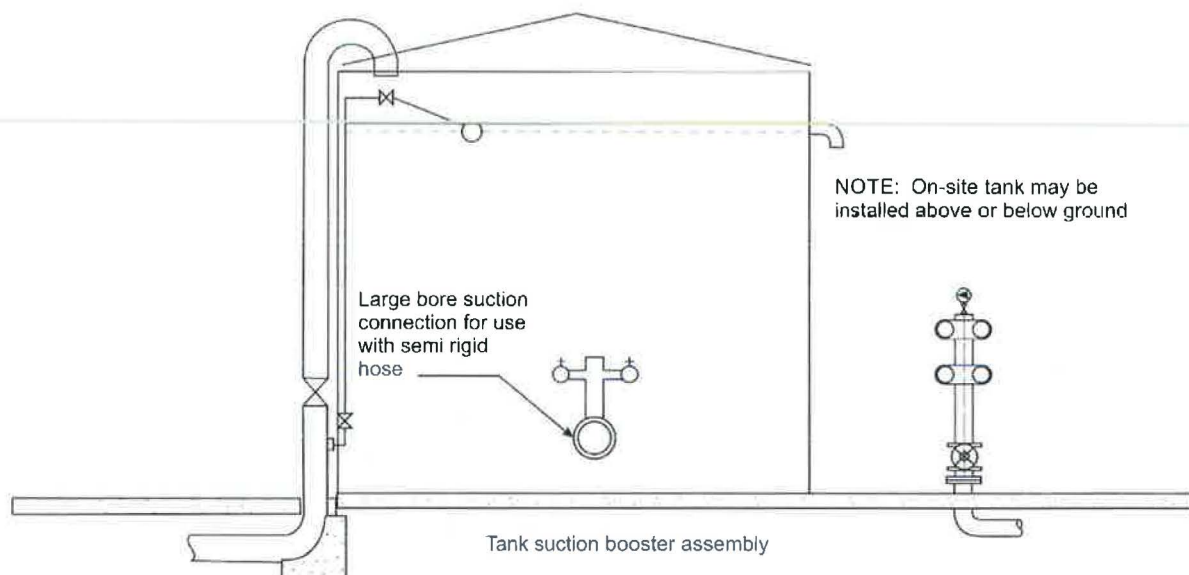


Figure 6 – Tank suction booster assembly provides for the use of semi-rigid large bore hose

Due to a concerning trend, FRNSW is now seeing tank suction booster assemblies. This is generally considered to be an 'industrial solution', although installed in multi-unit residential complexes due to the limited flow available in the nearest town main.

FRNSW believes the installation of these systems in multi-unit development complexes should be minimised through better planning and funding decisions. A possible means of improving this decision-making process would be to include 'a water flow rate' as a water utility performance indicator.



Figure 7 - Tank suction booster assembly serving a Class 2 building

The general public's opinion

Over the last decade, FRNSW has linked with several Councils to help find a resolution to their outstanding fire orders. In almost all instances, the community has expressed

the consistent view that they should not have to bear the cost of what they perceive is a water infrastructure-related issue.

Feedback on performance indicators

Detailed below is FRNSW's response to two questions from the IPART's issues paper. The questions selected have been identified as relevant to the legislated responsibilities of FRNSW and the issues discussed above.

Q4 Do stakeholders agree that it is appropriate for water utilities providing the same service to be subject to the same performance indicators?

As existing water supply infrastructure is used to serve development throughout NSW, FRNSW recommends that an appropriate and similar set of performance indicators is applied to all PWUs and *WIC Act* licensees. It is hoped that the problems confronted by existing building owners and developers can be more readily addressed.

Q13 Do stakeholders agree with our initial view that there is no need for any additional performance indicators for water pressure?

As discussed in the previous sections, the availability (and future availability) of an appropriate pressure and flow within a water supply network has significant implications for FRNSW operations. As well, the maintenance and continuing provision of existing 'wet' fire systems like fire hydrants and the type of 'wet' fire systems installed in new buildings. As such the requirement for Hunter Water and Sydney Water to report on water pressure alone without an associated flow value seems misleading as the implications for the maintenance and continuing provision of existing 'wet' fire systems or the design of a new fire service are significantly different where a pressure and flow of 150 kPa at 1 l/s available or a pressure and flow of 150 kPa at 10 L/s is available.

In light of the information detailed above, FRNSW recommends IPART include in their list of performance indicators the requirement that all PWUs and applicable *WIC Act* licensees detail the areas of their water supply network where the pressure and flow is less than 150 kPa at 10 L/s. While FRNSW have considered IPART's obligation to ensure 'that the benefits derived from requiring water utilities to report on performance indicators should outweigh the costs of collection and reporting', it should be noted that FRNSW have not consulted with either PWUs or *WIC Act* licensees regarding the cost of reporting such an item. Notwithstanding this comment FRNSW is of the belief that the possible benefits that such a performance indicator would provide include:

- Enabling FRNSW to more informed preplanning decisions relating to response protocols in areas where the water infrastructure provides reduced pressure and flow.
- Enabling FRNSW Fire Safety Unit to provide a more informed service to planning bodies, industry and the community regarding the requirements for fire protection.
- Enabling planning bodies and consent authorities to make more informed decisions regarding new zoning areas.
- Enable consent authorities to make more considered decisions regarding the issuing of and compliance with Fire Safety Orders.

- There is a possibility to incentivise PWUs and *WIC Act* licensees to undertake water infrastructure improvements where a clear disconnect exists between the performance of their water infrastructure, land zoning requirements and the development occurring in areas of low pressure and flow.
- Enable regulators to make a more informed decision about the possibility of including a lagging indicator for flow in the operating licence of PWUs and *WIC Act* Licensees.

Conclusion and Recommendations

There has been, and it is highly likely for the foreseeable future there will continue to be significant multi-unit development in the brownfield areas of Sydney. It is also highly likely that this form of development will extend more broadly throughout the regional cities and towns of NSW. This has implications for the community, as in some brownfield areas there seems to be a disconnect between the rate of renewal of urban planning (rapid) and the water agencies upgrading existing water infrastructure (slow).

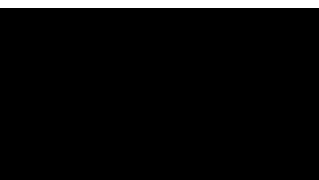
For developers, the attraction of brownfield sites is easily understood as they are typically close to transport infrastructure, schools, hospitals and other amenities. As such, these locations will always be desirable if there is ready access to facilities, mitigating some of the risk associated with development. As a consequence though, this form of development will continue to be dependent on existing water supply infrastructure that quite possibly may not have the capacity to service an ever-increasing demand. In this regard it is interesting to note that both Bondi and Dee Why, two active areas for development and urban renewal are serviced by very aged water infrastructure.

With consideration to the information detailed above FRNSW are of the opinion that the capacity and performance of existing water infrastructure has to be better understood to ensure that the community is provided with the most cost-effective solutions for development and fire protection. Currently, with no requirement by PWU's or *WIC Act* licensees to report on the available flow, the performance of existing water infrastructure cannot truly be understood.

To conclude; FRNSW strongly recommends that any future performance indicators for PWUs and *WIC Act* licensees includes a requirement to report areas within their networks that provide a pressure and flow less than 150 kPa at 10 L/s.

Should you require any further assistance, please contact me on [REDACTED]

Yours sincerely



Mark Whybro
Assistant Commissioner Community Safety