Memorandum of Understanding
(MoU)

The Australasian Scientific Review of Reduction of Flows on Plumbing and Drainage Systems

The Plumbing Efficiency Research Coalition (PERC)
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2) Terms of Agreement
Memorandum of Understanding (MoU)

Between;

Australasian Scientific Review of reduction of flows on plumbing and drainage systems (ASFlow) Committee

The Plumbing Industry Commission (PIC) enters this MoU as Trustee for the National Plumbing Regulators Forum (NPRF).

For the purpose of this MoU, PIC is represented by ASFlow which is a subcommittee of NPRF.

And;

Plumbing Efficient Research Coalition (PERC)

This MoU will commence from December 3rd, 2010 and will continue to December 3rd, 2011 unless otherwise terminated as agreed by both parties.

This MoU provides the foundation for a co-operative relationship between ASFlow and PERC, for the purpose of researching the presence, nature, cause, effects and remedies to any issues arising from current and future reduction on flows and ultra low flow fixtures performance in sanitary plumbing and drainage systems.

3) Objectives of MoU

The objective of this MoU is to set out the scope of the research collaboration between the parties for studying the sanitary flow and addressing any consequences of reduced water usage from water conservation measures, reduction in water usage by plumbing fixtures, and other drivers to reduce household and commercial water usage.

4) Background

Legislation in Australia requires all new or redeveloped residential dwellings to use less, reuse or use reclaimed waters through sustainable practices. This legislation drives manufacturers to produce more water efficient products, by mandating efficiency Standards. Individual states require varying degrees of
water efficiency through development application which certifies the level of efficiencies to be incorporated in the development.

Plumbing regulators and industry stakeholders are mindful of the effects these reduced flow are having on sanitary plumbing and drainage systems. Australia applies the design requirement in AS/NZS 3500, which is still based on the traditional 12 Litre flush volume for water closets (toilets).

As drain line flows reduce through reduced flush volumes, introduction of waterless urinals, low flow rated taps and outlets, grey and black water separation and reuse, sanitary systems have reached their design performance limitations. Sanitary system failures are being reported across Australia.

There has been little research conducted on the cause and effect of reducing sanitary flows.

As a result of known system failures, regulators and industry stakeholders have formed a cooperative group under the NPRF Technical Committee to investigate the implications of;

- flow reductions in sanitary plumbing and drainage systems,
- the impact on drain line transportation of reduced fixture flows where grey water is removed from the system,
- feasibility of ultra low flow discharges and
- make recommendation to Standards for modification to design requirements to accommodate water efficient technologies,
- impacts on network utilities operator systems.

In the United States, with the enactment of the Energy Policy Act of 1992, all water closets (toilets) manufactured in or imported into the United States were required to flush no more than a maximum average of 1.6 US gallons, effective January 1, 1994 for residential models and January 1, 1997 for all models. At that time, concern for drain line transport efficacy was voiced by many in the plumbing trade and those in various professional associations. However, early reporting and research on 1.6 gallon per flush (gpf) water closet models focused primarily on the flush efficacy of the various water closet models on the market in response to significant consumer complaints about poor flush performance. Since then, water closet manufacturers have made great strides in improving flushing performance. Intermittent and anecdotal complaints of drain line carry transport problems were not thoroughly researched and largely attributed to older or faulty sanitary drain lines.

Looking forward, newer technologies, such as non-water consuming and High Efficiency urinals (HEUs), lower flow rate faucets and increasingly efficient water consuming appliances will further reduce the amount of water discharged into sanitary waste systems. Equally significant are greywater reuse systems, systems within a residence collect discharged water from lavatory basins, clothes washers, bathtubs and shower fixtures for reuse, usually for irrigation purposes, is another emerging technology that significantly reduces waste water in residential sanitary drainage systems.
the commercial side, the emphasis upon water and energy use reduction has resulted in a proliferation of products in the medical and food service sectors that substantially reduce flows to the drain. Yet, to date, an extensive research project of sufficient scope to be able to determine if significant problems could arise regarding drain line transport in these “efficient buildings” has yet to be conducted.

Hence, both the AS-Flow and PERC recognise the need for comprehensive research to be conducted on reduced flows in sanitary systems.

5) **Research Plan**

Investigate and collaborate or research on current Australian, US and overseas research activities to avoid duplication.

Review current knowledge on impacts of reduced flows on sanitary plumbing and drainage systems.

Identify and quantify knowledge gaps.

- Review and compare installation and design practices of sanitary plumbing and drainage systems in the U.S. and Australia to establish the degree of commonality.

- Conduct rigorous tests on the test rig at Canberra Institute of Technology Australia of known plumbing system failures, test variations to design and fitting performance to those scenarios.

- Undertake fixture testing for new water efficient fixtures i.e. low flush WC’s

- Undertake field-based testing of variations to current design practices.

- Communicate with overseas research groups on research methodologies.

6) **Standards**

- Plumbing Code of Australia (PCA) and Associated Standards
- The International Plumbing Code and Associated Standards
- The National Standard Plumbing Code and Associated Standards
- The Uniform Plumbing Code and Associated Standards

7) **Intellectual Property Rights**

If the parties undertake a joint project (including investigation and collaboration between the parties) or research under clause 5)
involving expenditure or creation of intellectual property rights then the parties will enter a formal agreement. For the purpose of this clause intellectual property rights means the rights according to the ‘intellectual property laws’ as defined herein.

8) General Principles

Both parties agree to the following general principles as outlined in clauses 8 & 9.

9) Exchange of information

Privacy and Confidentiality

In the spirit of the collaboration, except to the extent necessary to comply with any statutory requirements or government policy relating to the public disclosure of confidential information, neither party will make public, disclose or use any confidential information of the other party unless the other party gives its prior written consent.

Where there is a conflict between this MoU and other MoUs executed internally by either ASFlow or PERC, the MoUs executed internally by either party shall prevail.

All findings and reports shall be coordinated and reviewed by the representatives of ASFlow and PERC shown in Section 12 of this MoU. The representatives shall ensure that there is general agreement regarding the contents of the report among all participating ASFlow and PERC members prior to publication.

It is acknowledged by the parties that each party must comply with intellectual property laws of their country. For the purposes of this clause, ‘intellectual property laws’ includes all proprietary rights in relation to information and material such as copyright and neighbouring rights (including tapes, software and information contained on data bases), and all proprietary rights in relation to inventions (including patents) registered and unregistered trademarks (including service marks), registered designs, confidential information (including trade secrets and know how) and circuit layouts, and all other proprietary rights resulting from intellectual activity in the industrial, scientific, literary and artistic fields.

10) Communication

ASFlow; NPRF web site www.plumbingregulators.org

PERC: Under development

11) Representatives

For the purposes of this MoU, ASFlow and PERC are to appoint two persons from each organisation to act as its representatives.
12) Terms and Review of this MoU

This MoU will be reviewed every 12 months of its operation as of the date of signing.

Both parties will agree to the timeframe of any process of review, amendment or replacement.

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<thead>
<tr>
<th>Signed for ASFlow</th>
<th>Signed for PERC</th>
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<tbody>
<tr>
<td>Name: Jeff Clark</td>
<td>Name: Peter DeMarco</td>
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<tr>
<td>[Signature]</td>
<td>[Signature]</td>
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<tr>
<td>Title: Chairman ASFlow Committee</td>
<td>Title: Chairman, PERC Technical Committee</td>
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<tr>
<td>Date: 3-12-2016</td>
<td>Date 12/3/2016</td>
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13) Contact List

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<tr>
<th>MOU Representative</th>
<th>ASFlow Position title</th>
<th>Primary / secondary contact details</th>
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