

Wipe Material Composition in Wastewater Blockages and Screens

NOTE: THIS PROJECT IS AN INITIATIVE OF THE WATER SERVICES ASSOCIATION OF AUSTRALIA. MORE DETAIL ON WSAA WIPE INITIATIVES IS AVAILABLE FROM:

<https://www.wsaa.asn.au/media/water-and-wipes-industries-come-together-tackle-issue>

IF YOU INTEND TO USE THIS METHODOLOGY PLEASE CONTACT WATER NEW ZEALAND or WSAA. WE WILL BE INTERESTED IN YOUR RESULTS.

1 Overview

1.1 Objective

This procedure sets out the process for the determination of material found to be blocking sewer pipes and coarse screens. Currently there are limited data on the nature of these materials within Australia. Obtaining more information will allow the industry to better understand the extent of the problem, characterise the materials that are responsible for the interferences and provide quantitative information to ultimately solve the problem.

1.2 Scope

These are empirical tests and there is no laboratory accreditation for this test.

Wipes are non-biodegradable, nonwoven fabrics that don't break down in wastewater systems. Many water utilities across the country have experienced an increase in pump blockages and increase loading at the Wastewater Treatment Plant screens that correlate with a rise in disposable wipe usage. These wipes can get stuck either in an individual's sewage pipes or a community's wastewater system. These can cause blockages and overflows into customers' properties or the environment.

This test is designed to determine, on a volume basis, what percent of the material blocking our community wastewater collection systems is composed of wipes. Sorting the wipes will initially be done by size as this is presently international best practice. Unfortunately, review of product has found that there is an overlap in some size categories, complicating analysis.

1.3 Sample Preservation and Holding Times

Samples are to be taken at blockage sites in 44 litre plastic boxes with snap lock lids. To ensure safe transport and sample handling these buckets are not to be filled over 50 % full. These samples are to be analysed within 24 hours of receipt at the laboratories. For this reason, it is necessary to ensure that the laboratory has prior knowledge of sample receipt times. Samples may be stored at between 1 and 6 °C prior to measurement.

Samples may be disposed in the sample buckets into domestic waste bins following measurement.

1.4 Safety

Personal protective equipment for working with wastewater samples include: rubber gloves (to minimise needle stick injuries), goggles or face shield, rubber aprons and laboratory coat. Staff undertaking this work must familiarise themselves with procedures for the control of infectious

disease risks. For the sake of group amenity, as many tasks as possible should be conducted outside or in a well ventilated fume cabinet.

2 Test method

2.1 Apparatus

- 2.1.1 Camera,
- 2.1.2 44 Litre lock lip lid container,
- 2.1.3 Water hose,
- 2.1.4 Wastewater Disposal Sink
- 2.1.5 Tarp to protect surfaces and arrange materials
- 2.1.6 Tape measure
- 2.1.7 Data entry forms
- 2.1.8 White Plastic Tray
- 2.1.9 Tongs
- 2.1.10 Spatula
- 2.1.11 Forceps
- 2.1.12 Trolley
- 2.1.13 Wide mesh screen (25 mm)
- 2.1.14 Non-dispersable Wipe Reference Folder.
- 2.1.15 Apron, rubber.

2.2 Procedure

2.3.1 Washing samples (to remove non-blocking matter)

- 2.2.1.1 Samples will be in 44 L containers and will require two man lift. Preferably trolleys should be used to move samples.
- 2.2.1.2 Before washing lay out the tarp so that washed material may be placed on it for sorting.
- 2.2.1.3 Place the wide mesh screen over the top of the sink and put on PPE.
- 2.2.1.4 Use tongs or your rubber-gloved hands to take small samples (i.e. < 125 g) and spread these over the screen.
- 2.2.1.5 Gently (to avoid splash back) wash the material to remove biodegradable and material that does not cause system blockages. Using gloved hands or forceps to pull material apart while washing. Place the segregated material in piles according to the following categories:
 - a. Paper towels;
 - b. Feminine hygiene products;
 - c. Personal hygiene wipes;
 - d. Flushable wipes;
 - e. Household cleaning wipes;
 - f. Baby Wipes
 - g. Nappies;

- h. Other - all other material not intended for disposal in a sewage system including but not limited to condoms, floss, branches, roots, bottles, plastic packaging, plastic material, etc.

2.3.2 Sorting for Quantification and Reference Matching

- 2.2.2.1 Divide the material into small piles of like material. Each pile should be roughly the size of a coffee cup.
- 2.2.2.2 Much of the paper material and nonwoven fabric material will be in small shredded torn bits. Count bits larger than 75 mm as a single entity for quantification.
- 2.2.2.3 Count individual piles to provide a volume estimate. Record numbers on data sheet.
- 2.2.2.4 Go through each pile and count individual components. In most cases, it is impossible to distinguish between personal hygiene wipes and flushable wipes. As the net effects of these materials on the wastewater system are similar they may be combined for the tally. Record numbers on data sheet.
- 2.2.2.5 Distinctive wipes and random (approx. 5 %) of whole wipes are to be dried in the Biosolids oven on a tray at 40 °C. These are to be compared against reference collection for positive identification.

2.3 Identification Clues

- 2.3.1 When you're looking to document flushable wipes (FW), set the minimum item size to less than 7.5 square cms in size.
- 2.3.2 Look at fibre length to tell the difference between paper towels and flushable wipes. Paper towels are all wood pulp = very short fibres, and if you tear a hole in the product, no fibres will stretch across the hole you just poked. With most flushable wipes, there are still a few synthetic or long fibres in the substrate, and you'll a few sticking into the hole you poked.
- 2.3.3 Most FW have some fibres that are a little bit shimmery. The exception to this is Kimberly-Clark's FW fabrics, which don't have any shimmer.
- 2.3.4 Layers: Most FW will have two layers. Most PTs are single-ply.
- 2.3.5 Anything with colour on it is a paper towel. No FW have colours.
- 2.3.6 Look for perforated edges on the scraps – these will be paper towels.
- 2.3.7 Anything with a brown tint (not from the sewage) is a commercial paper towel

2.4 Reporting of results

The results from the counts are to be made as data tables.

The results from the piles are to be expressed in % units to 2 significant digits. These are to be compared in graphical format to facilitate understanding.

3 Context

3.1 Definitions

For the purposes of this method the following definitions and abbreviations apply:

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| Personal Hygiene Wipes | Wipes designed for general sanitary cleaning (face and hands) on adults or for cleaning babies and infants following defecation. Some of these products have design features (colour or embossed patterns) that facilitate identification. These wipes are intended only for solid waste disposal. |
| Flushable Wipes | Commercial wipes intended to clean one's self following using the toilet. Manufacturers claim that this product is flushable and suggest using no more than two sheets at one time. |
| Toilet Paper | Toilet paper is a tissue paper product primarily used for personal hygiene. Toilet paper is designed to decompose in wastewater treatment systems including septic tanks, whereas some other bathroom and facial tissues are not. |
| Paper Hand Towels | Classification category that encompasses paper hand towels, napkins, kitchen towels and other paper sheets. |
| Feminine Hygiene Products | Materials associated with managing the menstrual cycle that includes tampons, feminine pads, liners, tampon applicators and the wrappers for these products. |
| Household Cleaning Wipes | Hard Surface/floor cleaning wipes, strong nonwoven articles with a sheet size that exceeds 300 x 300 mm. |

3.2 Responsibilities

| Position | Responsibility |
|--------------------|--|
| Laboratory Manager | Ensure that Non-Conformance and Corrective Action Procedures are followed to identify and correct processes in the laboratory that may affect the quality of work performed. |
| Laboratory staff | Must follow this document as instructed. |