



## FIELD TEST OF COMPATIBILITY OF NON-WOVEN PERSONAL WIPE MATERIALS

**Background:** Vancouver and many other municipalities throughout the U.S. are increasingly receiving more non-dispersible materials in sewerage systems and removing them from clogged pumps, collection wells, pipes and wastewater treatment plant screens. During a July 2012 meeting with representatives from Costco; a non-woven materials manufacturer; INDA (the trade association representing non-woven manufacturers); and several municipal agencies (including Orange County (CA) Sanitation District, Kirkland WA, King County WA and Vancouver WA), a question was raised regarding wastewater treatment plant staff's ability to identify the brand of such recovered materials, specifically wipes. Wipes are designed and manufactured with many different materials and formulations to create certain physical properties. Some products are acknowledged and labeled as non-flushable, while others are labeled as flushable, or otherwise safe for sewers.

With this question in mind, Vancouver staff set out to observe the fate of two identified wipe products, one labeled as flushable and the other labeled as non-flushable, in the sanitary sewer collection system. Staff would like to thank those involved in this test, from the original idea to this summary, for ongoing interest and efforts to seek solutions.

**Summary:** Kirkland Signature brand Moist Flushable Wipes and Pampers brand Baby Wipes were color-dyed and introduced into Vancouver's sanitary sewer system at three (3) manhole locations with varying distances from the city's municipal wastewater treatment plants. Vancouver Engineering Services staff observed and retrieved the dyed wipes from screening devices at the headworks of respective treatment plants (Westside and Marine Park wastewater treatment plants). Staff observed that both the Flushable and Baby wipes did not fully disperse in the sewer system. At Marine Park, where wastewater flows through screening devices after (downstream of) influent pumps, staff observed that some, but not all, of the Flushable wipes were torn and shredded. At Westside, where wastewater flows through screening devices before (upstream of) influent pumps, all collected Flushable wipes were fully intact. At both treatment plants, all collected Baby wipes were fully intact.

### Project Objective and Purpose

**Objective:** To determine compatibility of consumer non-woven wipes material in Vancouver's Publicly-Owned Treatment Works (POTW), including the collection system and wastewater treatment plant.

**Purpose:** The purpose of this test is to determine and document compatibility of these "flushable" products in a "real world", or more accurately, "real community" setting – the sanitary sewer system. The term "compatibility" is to be understood that non-food materials placed into the sanitary sewer (i.e. flushing) break down and disperse within a lateral or within one (1) minute after entering a public sewer; does not cause blockages in public sewer lines, pumps or other appurtenances; does not cause blockages in pipes at the wastewater treatment plant; does not cause pass-

through or interference with the processes at the treatment plant; does not cause the city to violate its NPDES permit limits and conditions.

### General Test Protocol Summary

For each round of tests, staff dyed 24 – 35 each of Kirkland Signature brand Moist Flushable Wipes and Pampers brand Baby Wipes in about three gallons of water-dye mix in buckets. The Flushable wipes were dyed dark red. The Baby wipes were dyed other colors, including orange and blue. The buckets of wipes were left to soak overnight. Total soak time was about 16 hours.

For each round of tests, the buckets of wipes were dropped into designated manholes (see Table 1 below), with the Flushable wipes first, and then within one minute, the Baby wipes. Time was recorded.

Staff then traveled to the respective treatment plant screens equipment and observed debris collected on the screens. When the dyed wipes appeared staff retrieved them using hand-held grabbers. Staff then rinsed the wipes with water and laid out on tarps or paper for observation.

Staff recorded "travel time", noted condition of the wipes and took pictures of them.

**Table 1 - Drop Locations**

<b>Date</b>	<b>Location</b>	<b>Distance to WWTP (lf)</b>	<b>Travel Time to WWTP (min)</b>	<b>Notes</b>
April 30	MH #12747	800	38	E-Interceptor to MP plant; about 4 MGD equivalent flow at time of test; wipes traveled through influent pump and then to screens
May 3	MH #1302	1,000	10 – 15	West Interceptor to WS plant; about 8 MGD equivalent flow at time of test; wipes collected at screens located upstream of influent pumps
May 10	MH #1891	5,000	45	West Lincoln Ave trunk line to Westside Interceptor to WS plant; about 8 MGD equivalent flow at time of test; wipes collected at screens located upstream of influent pumps

## **Conclusions**

- Both brands of dyed wipes did not disperse or otherwise break down as observed at Westside treatment plant screens.
- Dyed Baby wipes did not disperse or otherwise break down as observed at both treatment plants' screens.
- Dyed Flushable wipes were observed in both whole form and in shredded or torn form upon capture from the Marine Park plant WWTP screens. The wipes had traveled through Marine Park's influent pumps.

Figure 1 – April 26, 2013. Marine Park Wastewater Treatment Plant screenings

Dark Red – Flushable wipes.

Orange – Baby wipes.

White – Other; unidentified wipes.

MH #12747

Travel time – 38 minutes



Figure 2 – Westside Wastewater Treatment Plant screens  
May 3, 2015





Figure 3- Westside Wastewater Treatment Plant screenings

Dark Red – Flushable wipes.

Orange – Baby wipes.

MH# 1302

Travel time 10 minutes



Figure 4- Westside Wastewater Treatment Plant screenings

Dark Red – Flushable wipes.

Light Blue – Baby wipes.

Half torn dollar bill on red wipes

MH #1891

Travel time – 45 minutes



Figure 5 – Packaging label for Kirkland brand moist flushable wipes

