

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
PG				Ge	Submitting comments on the International Wastewater Services Flushability Group (IWSFG) Standard in this public comment period in no way represents participation in the development process of the IWSFG Standard or PAS test documents. Nor does commenting imply agreement with any content; where portions of the IWSFG documents have not been commented upon, consent with the content therein is not implied.		
PG				Ge	The IWSFG Standard and the associated Publicly Available Specification (PAS) documents do not outline an approach for determining compatibility with wastewater infrastructure. The IWSFG documents lack any content or context regarding infrastructure issues currently experienced by wastewater utilities. Further, the IWSFG documents contain no data, examples or details regarding issues that can be attributed to flushable wipes. Therefore, the IWSFG documents provide no justification for the proposed requirements for flushable products, and as such, the IWSFG Standard represent arbitrary performance requirements that are unfounded and unrelated to issues faced by wastewater utilities. The IWSFG documents do not contain sufficient documentation or information to establish why the IWSFG documents have been developed, or what results the IWSFG documents seek to achieve regarding flushable wipes beyond vague performance concepts.	Provide written justification for the IWSFG Standard, including reference to all data and examples of infrastructure issues attributable to flushable wipes.	
PG				Ge	Based on the results of field testing and forensics conducted by a range of stakeholders, all available evidence continues to reinforce the fact that flushable wipes are compatible with wastewater infrastructure.	Provide evidence of impact to wastewater infrastructure that has been demonstrated to be the result of flushable wipes. Note to Entry: Recovery of intact wipes from field studies is insufficient evidence. This testing	

¹ Adapted from the ISO/IEC Commenting template. ² Te = Technical, Ge = General, Ed=Editorial

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
						<p>contradicts the premise of the IWSFG Standard, specifically because the testing demonstrates the ability of flushable wipes to move with solids, which is the critical aspect for compatibility with wastewater infrastructure.</p> <p>From Section 19.14 "Flow in Gravity Sewers" in <i>Water-Resources Engineering</i> (4th Edition, McGraw-Hill, pg. 693):</p> <p>"To prevent the settlement of wastewater solids, the velocity in a sewer flowing full should be not less than about 2 ft/sec (0.6 m/sec). Such a sewer flowing one-sixth full will have a velocity of 1 ft/sec (0.3 m/sec), which is reasonably adequate. This is especially important in sanitary sewers, for decomposition of settled wastes results in undesirable conditions."</p>	
PG				Ge	The IWSFG documents specify that toilet paper was utilized for benchmarking the acceptance criteria of the PASs. No details regarding the processes that were followed in developing the benchmarks have been provided in association with the IWSFG documents. Reference to the historical performance of toilet paper is insufficient justification for establishing benchmark performance, and is particularly imprecise given the wide range of types and characteristics of toilet paper found globally.	Provide details of all benchmark testing conducted by the IWSFG to allow for independent validation and verification of the reproducibility of laboratory tests and acceptable criteria proposed by the IWSFG.	
PG				Ge	The IWSFG documents lack technical details linking the performance of any product (including toilet paper utilized as a benchmark) in any of the IWSFG PAS test methods, and the compatibility of that product with any portions of wastewater infrastructure.	Provide details of all testing (laboratory and field) where the established benchmarks were verified as appropriate and necessary for the protection of infrastructure.	
PG				Ge	The IWSFG documents contain multiple technical errors that render the documents unfit for publication or use as laboratory test methods	Fix contradictions, error and omission of all Publicly Available Specification (PAS) test methods.	

¹ Adapted from the ISO/IEC Commenting template. ² Te = Technical, Ge = General, Ed=Editorial

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
					without significant revision. For example, IWSFG-PAS-5A-Aerobic-Biodisintegration-Test-2017 contains no laboratory controls for evaluating if the test results are acceptable- this is critical error and omission, and renders the method unusable as written.		
PG				Ge	Given the extent of the revisions necessary, the IWSFG Standard and associated PASs should be resubmitted for a second public comment period once all errors and omissions have been rectified.	Fix contradictions, error and omission of all Publicly Available Specification (PAS) test methods and resubmit for a second public comment period.	
PG				Ge	The IWSFG documents contain no details regarding the processes that were followed in developing the IWSFG Standard and Publicly Available Specification (PAS), or the processes that will be followed for inclusion of public comments. Transparency regarding the processes that the IWSFG are following, including how the input of a range of stakeholders will be included, is necessary to understand whether the IWSFG standard has been developed appropriately.	Provide details of all test method and document development and approval processes being followed by the IWSFG.	
PG				Ge	The International Standards Organization (ISO) provides the following information regarding a Publicly Available Specification: "Publicly Available Specifications have a maximum life of six years, after which they can be transformed into an International Standard or withdrawn." https://www.iso.org/deliverables-all.html#TR .	Clarify if the IWSFG documents were developed in accordance with an ISO process, or if not, if they were developed using an ISO framework. Provide the life cycle of the IWSFG PAS documents, including the maximum life of the IWSFG PASs.	
PG				Ge	While the Draft status of the IWSFG Standard and PAS documents is acknowledged, significant editing of both general and scientific content of the documents is required. The lack of editorial and scientific rigor of the documents makes commenting ineffective at this stage of development.	The IWSFG Standard and PAS documents should be recalled, revised then resubmitted for a second public comment period; the documents are not in a condition suitable for public review.	
PG				Ge	The IWSFG Standard and each of the IWSFG PAS test methods contain numerous errors, as well as inter-method and intra-method contradictions	Revise all PAS test methods.	

¹ Adapted from the ISO/IEC Commenting template. ² Te = Technical, Ge = General, Ed=Editorial

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
					regarding critical technical details, that render the methods incapable of interpretation, let alone use as written. A laboratory, whether they were ISO-accredited or not, would be incapable of conducting the PAS tests as currently written.		
PG				Ge	The PASs contain numerous instances where different and contradictory "Acceptance Criteria" are provided, rendering the PAS unusable as currently written.	Revise PASs to eliminate contradictory procedures and "acceptance criteria".	
PG				Ge	<p>Misuse of the word "standard," and variations thereof, occurs frequently throughout the texts. The documents assembled by the IWSFG are neither a Standard, nor are they Publicly Available Specifications developed, for example, in accordance with the process set forth by the British Standards Institute (BSI). Revise all instances to utilize an appropriate term such as "Guideline" or equivalent. Alternatively, provide details of the national or international standards organization that is accrediting the documents as "standards" or as "Publicly Available Specifications." This is a critical element for understanding how the standard and associated PASs have been developed.</p> <p>Note to Entry:</p> <p>The first sentence of the British Standards Institute (BSI) definition of a standard requires agreement-not among a single organization or group of common stakeholders- but among "manufacturers, sellers, buyers, customers, trade associations, users or regulators." The full definition reads (https://www.bsigroup.com/en-GB/standards/Information-about-standards/what-is-a-standard/): "In essence, a standard is an agreed way of doing something. It could be about making a product, managing a process, delivering a service or supplying materials – standards can cover a</p>	<p>Clarify if the IWSFG has developed Standard 1 and the associated PAS documents in accordance with a standard process in accordance with a third-party certification body (ISO or BSI, as examples).</p> <p>In the interest of transparency, clarify the stakeholders groups and organizations that participated in the development of the IWSFG Standard and PAS documents.</p>	

¹ Adapted from the ISO/IEC Commenting template. ² Te = Technical, Ge = General, Ed=Editorial


Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
					<p>huge range of activities undertaken by organizations and used by their customers. Standards are the distilled wisdom of people with expertise in their subject matter and who know the needs of the organizations they represent – people such as manufacturers, sellers, buyers, customers, trade associations, users or regulators... They are designed for voluntary use so it's up to you – you're not forced to follow a set of rules that make life harder for you, you're offered ways to do your work better. Standards are knowledge. They are powerful tools that can help drive innovation and increase productivity. They can make organizations more successful and people's everyday lives easier, safer and healthier."</p> <p>Note to entry: use of the word, or quotation of the word "Standard" or similar in comments does not imply agreement with the use of the term in the IWSFG Standard 1 or PAS tests.</p>		
PG				Ge	Per the BSI definition of the term "standard" (https://www.bsigroup.com/en-GB/standards/Information-about-standards/what-is-a-standard/) that the IWSFG Standard and PAS documents are voluntary, and that the IWSFG neither possesses, nor is chartered to develop, mechanisms for enforcing these documents.	Clarify.	
PG				Ge	<p>Misuse of the word "require," and variations thereof, occurs frequently throughout the texts. The IWSFG documents can in no way require any action.</p> <p>Per the BSI definition of the term "standard" (https://www.bsigroup.com/en-GB/standards/Information-about-standards/what-is-a-standard/): "They are designed for voluntary use..."</p>	Revise to "recommend" or similar.	

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
					Note to entry: Use of the word, or quotation of the word “requirement” or similar in comments does not imply agreement with the use of the term in the IWSFG Standard 1 or PAS tests.		
PG				Ge	Contradictory use of words and phrases “test standards” “established IWSFG standard” or “Publicly Available Specification.”	Clarify the proper terminology to describe the documents the IWSFG has produced.	
PG				Ge	It is unclear from the documents if a national or international standardization body has certified, or will certify, the “established IWSFG standard.”	Clarify if a national or international standardization body has certified, or will certify, the IWSFG documents.	
PG				Ge	The goal of the IWSFG, as contained in IWSFG Standard 1 is to (emphasis added): “...identify those products that do not meet these test standards ,” implying that the PAS documents are “test standards.”	Clarify the nature of the PAS documents as “test standards” or as “Publicly Available Specifications.”	
PG				Ge	The “goal of the IWSFG” as described in the IWSFG Standard 1 document (“to identify those products that do not meet these test standards,”), differs from the “goal of the IWSFG” as stated in all the PAS documents: <ol style="list-style-type: none"> 1. PAS-0, PAS-1, PAS-2C, PAS-3A, PAS-5A, PAS-3B, PAS-3C, PAS-4, PAS-5B: “...established IWSFG standards” 2. PAS-2A: “...these tests” 3. PAS-2B: “...the IWSFG’s standards” 	Clarify and rectify inconsistencies. Specifically, whether the PAS are “test standards” “established IWSFG standards” “tests” or “IWSFG’s standard.” If deemed “standards,” clarify the national or international standards body that has accredited the PASs. Provide all documentation supporting the establishment of the PASs as standards.	
PG				Ge	The IWSFG Standard or PAS documents contain no documentation of operational issues that have been experienced by IWSFG members, or the utilities they represent, that have been caused by flushable wipes. Further, no justification for how those issues would be resolved as a result of implementation of the IWSFG Standard and PASs	Delete all content that if based on opinion of what is acceptable to individuals without any supporting data, test results or justification of any kind beyond anecdote. Provide documentation of operational issues that have been experienced by IWSFG members, or	

¹ Adapted from the ISO/IEC Commenting template. ² Te = Technical, Ge = General, Ed=Editorial

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
					<p>for flushable wipes is provided.</p> <p>The IWSFG Standard clearly states that the purpose and intent of the standard is “to establish for the manufacturers the limits of what is acceptable to wastewater services for discharge via toilets into the wastewater transport and treatment systems.” It is critical to note that this statement from the IWSFG does not outline specific product attributes or performance that are required for products to be compatible with wastewater infrastructure, which would be the appropriate approach for setting limits. The IWSFG Standard therefore represents an opinion on what is acceptable to certain individuals without any justification beyond anecdote. This is an unscientific process and is an unsuitable basis for establishing what is intended to be an international standard.</p> <p>Note to Entry:</p> <p>Consider Maximum Occupancy requirements as set out in state or local fire codes. For example, appended below is the Certificate of Operation for Place of Assembly in a building in New York City with a placeholder for the “Number of Persons” that are lawfully allowed to occupy the place of assembly:</p>	<p>the utilities they represent, that have been caused by flushable wipes.</p> <p>Clarify how those issues would be resolved as a result of implementation of the IWSFG Standard and PASs for flushable wipes.</p>	

1 Adapted from the ISO/IEC Commenting template. 2 Te = Technical, Ge = General, Ed=Editorial

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
					 <p>(From: https://www1.nyc.gov/site/buildings/business/place-of-assembly.page)</p> <p>Per the NYC Department of Buildings: “•A Place of Assembly (PA) Certificate of Operation is required for premises where 75 or more members of the public gather indoors or 200 or more gather outdoors, for religious, recreational, educational, political, or social purposes, or to consume food or</p>		

¹ Adapted from the ISO/IEC Commenting template. ² Te = Technical, Ge = General, Ed=Editorial

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
					<p>drink.</p> <ul style="list-style-type: none"> •In order to have a legal Place of Assembly, certain Fire and Building Code requirements must be fulfilled." <p>By way of example, for a place of assembly where the "Number of Persons" has been established at 100 persons per Fire and Building Code requirements for the New York City Department of Buildings, the entity responsible for the place of assembly could arbitrarily decide to set the "Number of Persons" at a number less than the value on the Certificate of Operation, for example determining that the "Number of Persons" that they will allow to occupy the room at 80 persons, or 20 less than the number permitted. It is possible that the entity responsible for the place of assembly could have based this lower number on the premise that the lower number (80 persons) was safer, based on their opinion regarding the number of individuals they wish to have occupy the place of assembly at any one point in time. This, however, does not make the number set in accordance with the NYC Fire & Property Maintenance Codes (100 persons) incorrect or unsafe. Establishing a value lower than a threshold value without evidence supporting the change in no way invalidates or alters the original value.</p> <p>Note to Entry:</p> <p>For example, consider the height requirements of Commercial Motor Vehicles (CMVs) in the United States. Were the Federal Department of Transportation (DOT) to utilize the same approach for setting height restrictions for CMVs that the</p>		

¹ Adapted from the ISO/IEC Commenting template. ² Te = Technical, Ge = General, Ed=Editorial

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
					<p>IWSFG has attempted for flushable products, the height limit for CMVs would be set at the height of the lowest bridge or other overhead crossing found globally. Clearly this approach would be inappropriate. Note that the Federal DOT in the United States doesn't even set a height requirement, instead ceding that responsibility to the States: "There is no Federal vehicle height requirement for CMVs. Thus, States may set their own height restrictions. Most height limits range from 13 feet, 6 inches (4.11 meters) to 14 feet (4.27 meters), with exceptions granted for lower clearance on particular roads." (From: https://ops.fhwa.dot.gov/freight/publications/size_regs_final_rpt/). First, note that there is no national height requirement in the United States for CMVs, due to the variability in infrastructure found throughout the continental United States. Second, and importantly, note that the height limits are not based on what is acceptable to the Federal DOT. Rather, these limits are set based on compatibility with infrastructure at the State level. Last, note that the worst-case scenario (for example 13 feet, 6 inches, or even lower for specific routes with lower overhead clearance) is not utilized to set CMV height nationally.</p> <p>Note to Entry:</p> <p>Similarly, consider the weight requirements of CMVs. "The bridge formula was introduced in 1975 to reduce the risk of damage to highway bridges by requiring more axles, or a longer wheelbase, to compensate for increased vehicle weight. The formula may require a lower gross vehicle weight, depending on the number and spacing of the axles in the combination vehicle." From (https://ops.fhwa.dot.gov/FREIGHT/sw/overview/ind</p>		

¹ Adapted from the ISO/IEC Commenting template. ² Te = Technical, Ge = General, Ed=Editorial

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
					ex.htm). As with CMV height limits, weight limits are set based on compatibility with infrastructure (in this example to reduce the risk of damage to highway bridges) not based on what is acceptable to the Federal DOT. Further, note that there exist State exemptions and variations: "In addition to the general standards described here, federal law includes provisions, exemptions, and variations applicable to particular states, routes, vehicles, or operations." Again, as with height limits, it is acknowledged that given the variability in infrastructure that exceptions and/or variations to the limits are necessary for specific instances. Further, and importantly, these exceptions have not utilized to set worst-case limits on weight limits for CMVs nationally.		
PG				Ge	<p>The IWSFG has provided no details regarding the process utilized to establish baseline performance. Specifically, no data regarding the performance of toilet paper in the PAS tests has been included in the documents available for public review. Further, no references to supporting documentation, test results, or other relevant substantiation demonstrating how and why toilet paper performance is required for infrastructure compatibility were provided for review. Without such documentation, IWSFG Standard 1 is a collection of unproven assumptions and untested hypotheses. As such, a thorough and complete review of the IWSFG Standard 1 cannot be conducted without access to relevant test results/data utilized to establish toilet paper as the benchmark in the IWSFG PAS tests.</p> <p>Note to Entry: Specifically with regards to the performance of toilet paper, the anecdotal performance of toilet paper is insufficient information for establishing a benchmark for testing. The assertion that "Since toilet papers historically</p>	<p>Clarify the process utilized to establish baseline performance for the IWSFG standard and PASs.</p> <p>Provide reference to information that details how toilet paper performance, as measured via the PAS tests and correlated to operations and maintenance data for wastewater systems, is necessary, and represents an upper limit of, compatibility with wastewater infrastructure.</p>	

1 Adapted from the ISO/IEC Commenting template. 2 Te = Technical, Ge = General, Ed=Editorial

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
					<p>have not caused clogging, or plugging, problems in wastewater systems” is vague and unsupported by any scientific data or reference, and therefore in unacceptable as the basis for establishing a benchmark for performance. Data establishing how toilet paper performance relates to infrastructure compatibility has not been provided, and as such, there is no evidence available to place toilet paper performance in context.</p> <p>Note to Entry: Provide details of benchmarking conducted, specifically the methodology utilized. See definition from ISO 17258:2015(E) Statistical methods — Six Sigma — Basic criteria underlying benchmarking for Six Sigma in organisations; First edition; 2015-01-15</p> <p>“Benchmarking is frequently used in various domains in connection with business activities. The Six Sigma methodology requires an evaluation step using a benchmarking process. In other words, a method for the comparison of levels of quality, performance, and productivity with the state-of-the-art is required. This International Standard establishes what to compare and develops a methodology to conduct a correct comparison between an organization’s levels of quality, performance, and productivity.</p> <p>The numbers given by the benchmarking can be integrated into any improvement programme to quantify any progress. They can also be used by other assessment processes in the organization such as regulation compliancy or financial performance evaluation.</p>		

1 Adapted from the ISO/IEC Commenting template. 2 Te = Technical, Ge = General, Ed=Editorial

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
					<p>Benchmarking is the whole process of collecting and processing data and information and comparing the results. The benchmark is the reference point for comparison.</p> <p>The main point of this benchmarking methodology, based on transparency and the universal principle of evaluation, is to give confidence to its calculating procedures and the results, so that comparisons between organizations are accepted by all parties.”</p>		
PG				Ge	<p>In a letter dated June 22, 2017, the Chief Executive Officer (CEO) of the National Association of Clean Water Agencies (NACWA) wrote the following regarding the IWSFG:</p> <p>“The International Water[sic] Services Flushability Group (IWSFG), made up of wastewater utilities from around the world, has developed draft flushability standards that will ensure flushable wipes are in fact safe for sewer systems. The draft standards will be published soon for public comment. Many wipes manufactured in Japan will pass these draft standards...”</p> <p>NACWA, a member of the IWSFG, appears to indicate in this letter that, in addition to toilet paper, benchmarking was done using Japanese wipes.</p> <p>Note to Entry:</p> <p>Similarly, a “Letter to the Editor” of the Northwest Current was published in December of 2016, jointly authored by the CEO of NACWA, and the General Manager of DC Water, and included the following: “While wipes sold in the U.S. would likely not meet standards set by D.C., Japanese and Spanish manufacturers produce wipes that are truly flushable, breaking down quickly after entering the</p>	<p>Revise all text referencing benchmarks to provide details of all benchmarking activities conducted for establishing IWSFG Standard 1.</p> <p>Provide the results of all testing of Japanese wipes conducted by the IWSFG in establishing IWSFG Standard 1 and associated PASs.</p> <p>Provide the list of all ISO-accredited laboratories that conducted the testing utilizing the IWSFG PAS tests on behalf of the IWSFG to which NACWA refers in the June 22, 2017 letter.</p> <p>Provide the results of all testing of Japanese and Spanish wipes conducted by the IWSFG in establishing IWSFG Standard 1 and associated PASs prior to December 2016.</p> <p>Provide the list of all ISO-accredited laboratories that conducted the testing utilizing the IWSFG PAS tests on behalf of the IWSFG to which NACWA and DC Water prior to December 2016.</p>	

1 Adapted from the ISO/IEC Commenting template. 2 Te = Technical, Ge = General, Ed=Editorial

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
					sewer.” This implies that as early as December of 2016 that benchmark testing of wipes from Japan and Spain was being conducted.		
PG				Ge	The IWSFG Standard and associated PAS documents do not account for all pathways in wastewater infrastructure. Significant omissions include the lack pump testing, and the inclusion of only passing references to septic tanks, and only where septic tanks are described as a source of discharges to wastewater treatment plants. This is a significant oversight by the IWSFG.	Revise the IWSFG Standard 1 and associated PAS documents to demonstrate how the IWSFG documents account for compatibility with all relevant wastewater pathways including pumps (including household pumps where materials will commonly enter the pump intact) and septic tanks (as wholly self-contained treatment units, not as precursors to municipal wastewater treatment).	
PG				Ge	Variations of the IWSFG and PAS documents can be developed by the IWSFG members, but no process is identified for how those would be available for review.	Provide details on the process for public commenting on alternate versions of PAS methods. Provide access on the IWSFG website to any country-specific alternate versions of PAS methods that currently exist but have not been made available for public comment.	
PG				Ge	There is significant overlap of content (both verbiage and technical details) between the IWSFG documents and the current draft of the Technical Report being developed by Working Group 10 (WG10) of Technical Committee 224 (TC224) within the International Standards Organization (ISO). For example: the “Purpose” provided in the “Forward[sic]” of each PAS (“the hydraulic, mechanical and environmental conditions of drain lines, various onsite treatment and wastewater collection and treatment systems as well as the receiving waters for treatment plant effluents”), bears a strong resemblance to the Title (“...the hydraulic, mechanical and environmental conditions generally found in wastewater transport systems from toilets through to wastewater treatment plants, and the related context.”) and Scope of the draft ISO TC224 WG10 Technical Report (“...the broad	Provide a background section including details on the authors and review committee with respect to the drafting and review processes for the IWSFG documents. Provide copies of any relevant communication with ISO stakeholders where the use of draft versions of intellectual property being developed as part of a multi-stakeholder process in TC224 WG10 by the IWSFG is licensed or otherwise allowed or condoned. Provide an explanation for how the IWSFG documents contain nearly identical language with the current draft of the Technical Report being drafted in ISO TC224 WG10. Provide an explanation for how specific technical details, including test durations, endpoints and acceptance criteria, are identical in both the	

¹ Adapted from the ISO/IEC Commenting template. ² Te = Technical, Ge = General, Ed=Editorial

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
					<p>hydraulic, mechanical and environmental conditions found globally in wastewater transport and treatment systems and their components...")</p> <p>Further, note the similarities between the Introductions of the ISO TC224 WG10 Technical Report ("provide the basis for wastewater services to delineate the qualities and characteristics of discharges to the wastewater system.") the Purpose of the IWSFG Standard ("criteria for the quality and characteristics of product that may be disposed via the toilet.")</p> <p>Further note there exist common technical details between the ISO TR ("The current practice of using 6 mm perforated plate screens appears to have optimized the mechanical condition of screening inlet works at treatment plants") and the IWSFG documents ("Then the content of the beaker is poured onto a 6.3 mm perforated sieve to confirm its disintegration."). Further examples exist of identical technical details in both the ISO TR ("the Technical Report recommends that designs for grill or pump encounters under continuously flowing conditions should be 2 hours.") and with corresponding language from the IWSFG documents ("Place a single preconditioned test specimen into each box, place lids on the boxes and oscillate the mixture for 120 minutes.").</p> <p>Copyright issues notwithstanding, note that the work of the ISO group is in draft form, and the process has not resulted in consensus agreement among the participating experts.</p>	<p>IWSFG and ISO documents.</p> <p>Provide copies of any relevant communication with external (non-IWSFG) stakeholders, where content of the IWSFG Standard and PAS tests is licensed or otherwise allowed or condoned.</p>	
PG	4		Paragraph	Ge	<p>Per the British Standards Institute (BSI) definition of the Publicly Available Specification (PAS) process, the public comments must be addressed to ensure that the content is satisfactory to "a wide range of stakeholders." From BSI</p>	<p>In keeping with the designation of these documents as PAS, confirm the IWSFG will modify the Standard and associated PASs to the satisfaction of a wide range of stakeholders.</p>	

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
					(https://www.bsigroup.com/LocalFiles/en-GB/PAS/The%20PAS%20Process/BSI-PAS-0-2012-Principles-of-PAS-standardization-UK-EN.pdf): "Final consensus and publication: Comments arising from the public consultation are discussed by the steering group, with the aim of achieving a document underpinned by consensus (see 4.6)...In common with all BSI standardization documents, publication is subject to approval by the Director of Standards who will seek evidence that the final text of the document commands support from a wide range of stakeholders."		
PG	4			Ge	The PAS process is intended to be transparent.	Given that the PAS process is intended to be transparent, provide details regarding the process the IWSFG will follow for revising the documents.	
PG	6-7		Copyright Notice	Ge	IWSFG has attempted to copyright material that is currently under copyright protection. For example, consider the following definition from BSI (https://www.bsigroup.com/LocalFiles/en-GB/PAS/The%20PAS%20Process/BSI-PAS-0-2012-Principles-of-PAS-standardization-UK-EN.pdf): "2.2 essential intellectual property rights (essential IPR) intellectual property rights that have been included within a PAS such that it would be impossible to implement the PAS without making use of those rights, and the only way to avoid an infringement of the rights in respect of implementation of the PAS is therefore to request a licence from the owner."	Provide evidence of consent/license on the IWSFG for all copyrighted content the IWSFG has utilized that was not developed by the IWSFG.	
PG	16		Forward [sic]	Ge	General and technical content in the IWSFG Standard and associated PASs, and the current Draft Technical Report (TR) from TC224 WG10, share a common source. The "purpose" included in the forward[sic] of the IWSFG Standard 1 contains language identical to	Describe how the membership of the IWSFG differs from the wastewater stakeholders in International Standards Organization (ISO) Technical Committee (TC) 224 Working Group 10 (WG10). Declare for all common details between the IWSFG and ISO documents, if the IWSFG or ISO	

¹ Adapted from the ISO/IEC Commenting template. ² Te = Technical, Ge = General, Ed=Editorial

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
					the Scope of the ISO TC224 WG10 TR.	are the rightful copyright owners.	
PG	16		Forward [sic]	Ge	<p>Sentence describing wastewater services is hyperbole.</p> <p>Expectations of the IWSFG are irrelevant to the document.</p>	<p>Delete the following sentence: "Wastewater services are organizations acting for the public good as a public service. The group expects the manufacturers and distributors of their products to act in a socially responsible and environmentally sustainable manner by adhering to the established standards."</p> <p>If the sentence is retained, for context, provide the IWSFG's position on "blending," specifically how the practice of blending protects the public good and represents environmentally sustainable operation by wastewater services.</p> <p>Note to entry:</p> <p>"The [US Environmental Protection Agency] EPA issued guidance in the mid-2000s banning a technique used by some utilities in which some wastewater is routed around the treatment process before being blended with treated flows and then discharged into areas in the receiving waters known as mixing zones. The practice is used to keep the high volumes of wastewater, such as those during storms, from overwhelming the treatment plant. The agency said blending and the use of mixing zones violate the Clean Water Act." (from: https://www.bna.com/wastewater-practice-mostly-n57982084593/). "Opponents argue that the blending ban raises costs for wastewater utilities." (From https://www.wateronline.com/doc/epa-s-wet-weather-policies-debated-in-court-0001)</p>	
PG	82-85	1	Introduction	Ge	Hyperbole. Wastewater services operate wastewater infrastructure. As noted in comments regarding Line 16, wastewater services also undertake actions that have economic drivers that are neither for the public good, nor to protect the	Revise to read: "Wastewater services operate wastewater infrastructure."	

¹ Adapted from the ISO/IEC Commenting template. ² Te = Technical, Ge = General, Ed=Editorial

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
					environment. Wastewater services operate wastewater infrastructure within budgetary and technological, not ideological, frameworks.		
PG	89-92	1	Introduction	Te	Example is vague and only tangentially related to the issues currently faced by wastewater utilities.	Delete and replace with an estimate of annual costs associated with maintenance, rehabilitation and replacement of wastewater infrastructure (i.e., an actual sewer system and wastewater treatment plant). If retained, provide a reference to the source of the data for the calculation(s) utilized for determining the replacement value.	
PG	89-92	1	Introduction	Te	IWSFG Standard contains no details or evidence of impacts to wastewater infrastructure caused by flushable wipes. Note to Entry. An independent collection study conducted on behalf of the New York City Department of Environmental Protection and the New York City Law Department determined that less than 2% of materials recovered from the sewer were determined to be flushable wipes. Note to Entry. The collection study was conducted by independent consultants utilizing a procedure developed by the National Association of Clean Water Agencies (NACWA). Despite the use of NACWA protocol, the CEO of NACWA disparaged the study in a June 22, 2017 letter, providing no evidence for his derision, writing that “this study is an unreliable representation of the situation in sewer systems in D.C. and nationwide... The study consisted of an analysis of only two 5-gallon buckets of materials.” It is emphasized that this criticism from NACWA is puzzling, as it is directed at a study conducted in accordance with a protocol developed by NACWA. Note to Entry. The letter goes on to state that the	Members of the IWSFG have claimed in testimony that damages resulting from wipes cost utilities of up to \$1 billion dollars annually. Provide a detailed cost analysis of this estimate, including all sources of values utilized in calculations. Further, based on forensics and associated data, provide the costs specifically attributable to flushable wipes.	

¹ Adapted from the ISO/IEC Commenting template. ² Te = Technical, Ge = General, Ed=Editorial

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
					<p>study was “conducted after two days of heavy rainfall, which likely washed additional trash into [the] system.” This is an incorrect, and unscientific interpretation of how trash is transported during rainfall events in general, and the precipitation leading up to the collection study, in particular. First, heavy rainfall would <i>clear</i> the sewer of trash, due to a phenomenon referred to as a “first flush.” Were the rainfall to have been heavy, as described in the letter, a significant majority of the trash and other materials in the sewer would have been transported to the Wards Island pumping stations (or discharged to a receiving water body via a combined sewer overflow) well in advance of the collection study. Importantly, the precipitation in the two days preceding the collection was not “heavy.” In fact, evaluation of the rainfall in the days leading up to the collection study reveals that the storms were low-intensity- all having return frequencies of less than one-year (i.e., typical, not heavy precipitation). Precipitation in New York City on February 16th ended at approximately 4PM, or 14 hours before the Collection Study began on February 17th. Therefore, based on comparison to historic records, it can be concluded that flow would have returned to baseline levels during the evening hours of February 16th, well before the Collection Study. As a result, the materials collected, including trash on February 17th, represents typical loading to the New York City sewer system, unaffected by the precipitation. Further, it should be emphasized that the amount of trash in the sewer would in no way impact the number of flushable wipes present or recovered.</p> <p>Note to entry: The following table provides a comparison of the rainfall intensity on February 16, 2016 (the day before the Collection Study) to National Oceanic</p>		

1 Adapted from the ISO/IEC Commenting template. 2 Te = Technical, Ge = General, Ed=Editorial

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat																
					<p>and Atmospheric Administration storm return frequencies (i.e., 100-year storm). As shown, the rainfall was of low intensity when compared to 5-minute, 1-hour and 2-hour maximum intensities:</p> <table border="1" data-bbox="725 432 1254 767"> <thead> <tr> <th>Rainfall Intensity (in)</th> <th>February 16, 2016*</th> <th>1-year storm[@]</th> <th>2-year storm[@]</th> </tr> </thead> <tbody> <tr> <td>5-minute maximum (in)</td> <td>0.15**</td> <td>0.354</td> <td>0.424</td> </tr> <tr> <td>1-hour maximum (in)</td> <td>0.58</td> <td>1.07</td> <td>1.28</td> </tr> <tr> <td>2-hour maximum (in)</td> <td>0.86</td> <td>1.43</td> <td>1.69</td> </tr> </tbody> </table> <p>* - Weather History for KNYC- February, 2016; https://www.wunderground.com/history/airport/KNYC ** - Weather History for KLGA- February, 2016; https://www.wunderground.com/history/airport/KLGA [@] - National Oceanic and Atmospheric Administration – National Weather Service; Hydrometeorological Design Studies Center; Precipitation Frequency Data Server; NOAA ATLAS 14 POINT PRECIPITATION FREQUENCY ESTIMATES: NY</p> <p>Note to Entry: Further evaluation of the rainfall on February 16, 2016 is possible through comparison to previously recorded rainfall in New York City- specifically, use of data from a rainfall event recorded on June 2, 1996 at the Manhattan Pump Station (available in the <i>Landside Modeling Report, Volume 6; Newtown Creek WPCP; Final</i>; The City of New York, Department of Environmental Protection, Bureau of Engineering Design & Construction; October 2007;</p>	Rainfall Intensity (in)	February 16, 2016*	1-year storm [@]	2-year storm [@]	5-minute maximum (in)	0.15**	0.354	0.424	1-hour maximum (in)	0.58	1.07	1.28	2-hour maximum (in)	0.86	1.43	1.69		
Rainfall Intensity (in)	February 16, 2016*	1-year storm [@]	2-year storm [@]																				
5-minute maximum (in)	0.15**	0.354	0.424																				
1-hour maximum (in)	0.58	1.07	1.28																				
2-hour maximum (in)	0.86	1.43	1.69																				

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat															
					<p>Page 4-49). Note that on June 2, 1996, despite a rainfall event that was three-times larger than the rainfall on February 16, 2016, baseline flow resumed after 8 hours. Therefore, it can be concluded that flow during the February 17, 2016 collection study was at or near baseline conditions. This is confirmed by the information provided by NYCDEP, which determined that flow during the collection study was nominally higher (~7%) versus flow recorded the previous week.</p> <table border="1"> <thead> <tr> <th>Metric</th> <th>June 2, 1996</th> <th>February 16, 2016</th> </tr> </thead> <tbody> <tr> <td>Rainfall Total (in)</td> <td>3.1</td> <td>1.02</td> </tr> <tr> <td>Rainfall Duration (hr)</td> <td>11</td> <td>2</td> </tr> <tr> <td>Peak Rainfall (in/hr)</td> <td>0.43</td> <td>0.58</td> </tr> <tr> <td>Rainfall Average (in/hr)</td> <td>0.12</td> <td>0.4</td> </tr> </tbody> </table>	Metric	June 2, 1996	February 16, 2016	Rainfall Total (in)	3.1	1.02	Rainfall Duration (hr)	11	2	Peak Rainfall (in/hr)	0.43	0.58	Rainfall Average (in/hr)	0.12	0.4		
Metric	June 2, 1996	February 16, 2016																				
Rainfall Total (in)	3.1	1.02																				
Rainfall Duration (hr)	11	2																				
Peak Rainfall (in/hr)	0.43	0.58																				
Rainfall Average (in/hr)	0.12	0.4																				
PG	89-92	1	Introduction	Te	<p>Example is vague and only tangentially related to the issues currently faced by wastewater utilities.</p> <p>All available evidence from collection studies and system monitoring has demonstrated that flushable wipes are compatible with infrastructure.</p>	<p>Provide data detailing impacts to wastewater infrastructure caused by flushable wipes.</p> <p>Alternatively, provide references to available collection studies and/or operations and maintenance costs over a period of 15 years (the relevant timeframe as noted in Line 94) that demonstrates impact known to have resulted from flushable wipes.</p>																
PG	93-96	1	Introduction	Te	Vague	Provide data regarding the hygiene products market on which this statement is based.																
PG	97-98	1	Introduction	Te	Incorrect. The toilet is a disposal unit. The issue to be addressed is the improper disposal of products neither designed, marketed or intended to be	Delete.																

¹ Adapted from the ISO/IEC Commenting template. ² Te = Technical, Ge = General, Ed=Editorial

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
					flushed.		
PG	99-101	1	Introduction	Te	Hyperbole. Sewers are designed to transport solids along with wastewater. This language in Lines 99-101 appears to attempt to claim that sewers are incapable of processing and treating any “additional” products, thereby implying that sewers have a design limit for the quantity of products they can convey- this is incorrect and not supported by standard sewer design. Sewers and treatment plants are limited in their hydraulic capacity, and treatment plants are further limited with respect to loading of organic material.	Provide references to sewer design and/or studies that establishes the upper limit of solids a sewer is designed to convey, and additionally supports the claim that wastewater infrastructure is not “capable of handling these additional “flushed” products.”	
PG	107-110	1	Introduction	Te	Assertions are vague, unreferenced and unsupported. Anecdotal.	Provide reference to data supporting the implication of impacts to the aquatic environment and biosolids directly attributable to flushable wipes. Further, provide reference to data supporting the compatibility of cellulose with the aquatic environment and biosolids.	
PG	107-110	1	Introduction	Te	Lacks appropriate details and references.	Provide references to sources/data containing the rate of the breakdown of “natural cellulose products” in wastewater treatment plants and various receiving environments.	
PG	107-110	1	Introduction	Te	Clarification necessary.	Confirm that the IWSFG has determined that “natural cellulose products, chemicals, fragrances and bonding agents” do not impact collection and treatment systems, and do not adversely affect either the aquatic environment, or land to which biosolids are applied. Provide all data and references on which these determinations are based. Note if these are risk-based determinations.	
PG	114-115	2	Purpose	Te	Overlap of language between IWSFG Standard and ISO TC224 WG10 Technical Report.	Provide an explanation for the similarities between the language in the IWSFG standard 1 and the	

¹ Adapted from the ISO/IEC Commenting template. ² Te = Technical, Ge = General, Ed=Editorial

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
						ISO TC224 WG10 Technical Report documents seeking to establish “criteria for the quality and characteristics of products.” Further, declare IWSFG’s understanding if that phrase is the intellectual property of ISO or the IWSFG.	
PG	119	2	Purpose	Te	Vague. As defined, wastewater services refers to “services provided by wastewater utilities acting for the public good as a public service.” This implies acceptability to an entity or persons, and it is noted that the concept of what is acceptable to a person or group of persons can change over time or be biased by any number of factors, and is therefore an unscientific and inappropriate metric for establishing a testing framework. Note to Entry: Lines 200-201 provide a relevant example, where “what is acceptable to wastewater services” has changed with regard to flushability. In 2013, wastewater stakeholders, including members of the IWSFG, actively sought to prevent the use of the word “disintegration” in industry guidelines, instead actively lobbying for the inclusion of the term “dispersibility.” Yet, despite this previous position, IWSFG standard 1 contains the following language: “Note: The International Wastewater Services Flushability Group does not recognize euphemisms such as “dispersible.” This shift in what is “acceptable to wastewater services” clearly demonstrates why defining acceptability based on the opinion of a collective of individuals is inappropriate, as positions and opinions change over time.	Provide specific data and related analyses describing how the “limits of what is acceptable to wastewater services” relate to compatibility with wastewater infrastructure.	
PG	119	2	Purpose	Te	Vague. Note to Entry: The IWSFG has provided no details regarding the process utilized to establish baseline performance. Specifically, no data regarding the	Remove reference to “wastewater services.” Revise to read: “limits of what is compatible with the wastewater system.”	

¹ Adapted from the ISO/IEC Commenting template. ² Te = Technical, Ge = General, Ed=Editorial

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
					<p>performance of toilet paper in the PAS tests has been included in the documents available for public review. Further, no references to supporting documentation, test results, or other relevant substantiation demonstrating how and why toilet paper performance is required for infrastructure compatibility were provided for review. Provide reference to information that details how toilet paper performance, as measured via the PAS tests and correlated to operations and maintenance data for wastewater systems, is required to ensure compatibility with wastewater infrastructure. Without such documentation, IWSFG Standard 1 is a collection of unproven assumptions and untested hypotheses. As such, a thorough and complete review of the IWSFG Standard 1 cannot be conducted without access to relevant test results/data utilized to establish toilet paper as the benchmark in the IWSFG PAS tests.</p> <p>Note to Entry: Specifically with regards to the performance of toilet paper, the anecdotal performance of toilet paper is insufficient information for establishing a benchmark for testing. The assertion that “Since toilet papers historically have not caused clogging, or plugging, problems in wastewater systems” is vague and unsupported by any scientific data or reference, and therefore is unacceptable as the basis for establishing a benchmark for performance. Data establishing how toilet paper performance relates to infrastructure compatibility has not been provided, and as such, there is no evidence available to place toilet paper performance in context.</p> <p>Note to Entry: Provide details of benchmarking conducted, specifically the methodology utilized. See definition from <i>ISO 17258:2015(E) Statistical methods — Six Sigma — Basic criteria underlying</i></p>	<p>Provide the scientific basis for the establishment of the “limits of what is acceptable” to wastewater infrastructure (the wastewater system, as defined in the IWSFG documents) based on laboratory results of the benchmark materials using the IWSFG PAS tests.</p>	

¹ Adapted from the ISO/IEC Commenting template. ² Te = Technical, Ge = General, Ed=Editorial

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
					<p><i>benchmarking for Six Sigma in organisations</i>; First edition; 2015-01-15 (emphasis added):</p> <p>“Benchmarking is frequently used in various domains in connection with business activities. The Six Sigma methodology requires an evaluation step using a benchmarking process. In other words, a method for the comparison of levels of quality, performance, and productivity with the state-of-the-art is required. This International Standard establishes what to compare and develops a methodology to conduct a correct comparison between an organization’s levels of quality, performance, and productivity.</p> <p>The numbers given by the benchmarking can be integrated into any improvement programme to quantify any progress. They can also be used by other assessment processes in the organization such as regulation compliancy or financial performance evaluation.</p> <p>Benchmarking is the whole process of collecting and processing data and information and comparing the results. The benchmark is the reference point for comparison.</p> <p>The main point of this benchmarking methodology, based on transparency and the universal principle of evaluation, is to give confidence to its calculating procedures and the results, so that comparisons between organizations are accepted by all parties.”</p>		
PG	121	2	Purpose	Te	The goal and/or purpose of the IWSFG, as contained in IWSFG Standard 1 is to (emphasis added): “...identify those products that do not meet these test standards ,” implying that the PAS documents are “test standards.”	Clarify the nature of the PAS documents as “test standards” or as “Publicly Available Specifications.”	
PG	123-124	2	Purpose	Te	This document is not a “Standard”	Revise to “guideline” or similar.	

¹ Adapted from the ISO/IEC Commenting template. ² Te = Technical, Ge = General, Ed=Editorial

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
PG	131-133	3	Scope	Te	Vague.	Clarify if toilet paper is included in the Scope	
PG	134-135	3	Scope	Te	Incomplete. Vague.	Provide a list of all third-party ISO-accredited laboratories currently conducting the PAS tests.	
PG	134-135	3	Scope	Te	Incomplete. Vague.	Provide a list of all third-party ISO-accredited laboratories that participated in the development of IWSFG Standard 1. Share summaries of relevant results from laboratory tests used to establish benchmark performance for the IWSFG Standard 1. Share testing to establish benchmarks for toilet paper, Japanese wipes and Spanish wipes.	
PG	146	4	Normative References	Te	Incomplete. Vague.	Provide a list of all third-party ISO-accredited laboratories that participated in the development of IWSFG Standard 1. Share summaries of relevant results from laboratory tests used to establish benchmark performance for the IWSFG Standard 1; in particular, testing to establish benchmarks for toilet paper, Japanese wipes and Spanish wipes.	
PG	146	4	Normative References	Te	Incomplete. Vague.	Clarify if a second PAS-2A, entitled PAS-2A(UK) exists. If so, provide the document for public comment.	
PG	160-161	6.1	Critical Criteria	Te	Vague. Insufficient details regarding use of toilet paper for establishing benchmark performance as noted in Lines 105-107 of PAS-3A: "...the IWSFG has benchmarked its tests for flushability to toilet paper performance..."	Revise the language in Lines 160-161 to clearly describe the process undertaken to benchmark the tests using toilet paper. Clarify if the purpose of the IWSFG Standard and associated PASs is to establish test methods for the evaluation of toilet paper.	
PG	161	6.1	Critical Criteria	Te	Vague. As defined, "wastewater services" refers to "services provided by wastewater utilities acting for the public good as a public service."	Revise paragraph to focus on compatibility with wastewater infrastructure, or the "wastewater system" not "wastewater services."	

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
PG	168	6.1	Critical Criteria	Te	Vague. The IWSFG has neither the expertise nor the authority to set global criteria for the protection of human health.	Clarify if the term "health" refers to human health. Clarify by what means the IWSFG has the expertise or the authority to set global criteria for the protection of human health.	
PG	168	6.1	Critical Criteria	Te	The IWSFG has neither the expertise nor the authority to set global criteria for environmental protection. Note that wastewater services are regulated by various authorities (the United States Environmental Protection Agency, for example) that set criteria for environmental protection. This is confirmed by the statement from the Lines 227-231, which reads: "Any product including any components thereof or substances (such as bonding agents and lotions) used within or on the product that are banned for environmental and human health reasons by the national legislation of a country where the product is to be marketed, is NOT FLUSHABLE by this standard."	Delete Related, delete PAS-1. If Lines 168 and PAS-2 are retained, clarify by what means the IWSFG has the expertise or the authority to set global criteria for the protection of the environment.	
PG	175-176	6.1	Critical Criteria	Te	Contradictory. Section 6.2 states that only one of the disintegration tests must be passed. As such, the statement, "Failure to meet any of the critical criteria as shown in section 6.2 means that the product will not be recognized by wastewater services as being flushable..." is incorrect and misleading.	Revise to state that a product can fail to meet the critical criteria for two IWSFG PAS tests and still be recognized as flushable by IWSFG.	
PG	184-187	6.3	Conformity Assessment	Te	Clarify. IWSFG Standard 1 contains the following: "The conformity assessment and certification of flushable products shall be undertaken only by third party processes, provided by organizations accredited to ISO/IEC 17025:2005 <i>General requirements for the competence of testing and calibration laboratories.</i> "	Confirm that all testing conducted for the development of IWSFG Standard 1 was done by laboratories accredited to ISO/IEC 17025:2005.	
PG	184-187	6.3	Conformity Assessment	Te	Clarify. IWSFG Standard 1 contains the following: "The conformity assessment and certification of flushable products shall be undertaken only by third	Provide the results of all testing conducted for development of benchmarks for IWSFG Standard 1 done by laboratories accredited to ISO/IEC	

¹ Adapted from the ISO/IEC Commenting template. ² Te = Technical, Ge = General, Ed=Editorial

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
			t		party processes, provided by organizations accredited to ISO/IEC 17025:2005 <i>General requirements for the competence of testing and calibration laboratories.</i> "	17025:2005. Provide all details of all experiments to allow for independent verification of the benchmarking tests. This will facilitate testing to verify the reproducibility and reliability of the tests for evaluating toilet paper as a benchmark.	
PG	200-201	6.4.1	Conforming Products	Te	Vague.	Confirm that all members of the IWSFG consider the term "disintegrate" to be the appropriate term to describe the process by which products break apart in a sewer, and do not recognize the term "disperse."	
PG	203-204	6.4.2	Non-Conforming Products	Te	The IWSFG document is not a Standard, as the documents (IWSFG Standard 1 and the PASs) were not developed as part of a standards development process. As such, there is no conformance requirements, nor labeling requirements.	Delete "shall" and similar language. Revise to indicate that these are suggestions.	
PG	233	7.1.2	Plastics	Te	Vague and undefined.	Define "plastic material"	
PG	233	7.1.2	Plastics	Te	Contradictory. IWSFG standard 1 provides no provisions for a product that contains a "plastic" the meets the critical criteria (Section 6.2) for all IWSFG tests. Note to Entry: From <i>PLA and PHA Biodegradation in the Marine Environment</i> ; California Department of Resources Recycling and Recovery; March 2012 (emphasis added): "The California Department of Toxic Substances Control and California Department of Resources Recycling and Recovery (CalRecycle) initiated a research study with the California State University Chico Research Foundation to understand the biodegradation of polylactic acid (PLA) and polyhydroxyalkanoate (PHA) in the marine	Provide the rationale for declaring that a product that contains any "plastic" would not be suitable for flushing even if it meets the critical criteria for all IWSFG tests. Further, provide the rationale for not allowing any "plastic" that biodegrades at a rate equal to cellulose.	

¹ Adapted from the ISO/IEC Commenting template. ² Te = Technical, Ge = General, Ed=Editorial

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
					<p>environment and to study any chemical intermediates that might be released during biodegradation.</p> <p>The research goals were to determine the fate and persistence of PLA and PHA bioplastics during biodegradation in the marine environment. Tests were conducted per American Society of Testing and Materials (ASTM) standards for biodegradation specification and test method in the marine environment. In this study, we evaluated the biodegradation of PHA and PLA plastic samples in a simulated marine environment and conducted several tests to identify any stable hazardous byproducts of biodegradation.</p> <p>ASTM standards require testing of plastic samples in a simulated marine environment for six months while at 30C. The specified temperature in the ASTM test method is warmer than representative ocean temperatures along the California coast. After six months of testing, results showed that 38 percent and 45 percent, respectively, of two PHA samples and 38 percent of cellulose sample (positive control) biodegraded into carbon dioxide. Only 3 percent of the PLA sample and 3 percent of polyethylene plastic bag (negative control) biodegraded into carbon dioxide.</p> <p>Although not required by ASTM, the biodegradation testing was extended from six months to 12 months in this study so we could understand the behavior of PHA and PLA after extended periods in ocean water. After 12 months, the biodegradation results show that 52 percent and 82 percent of two PHA samples and 52 percent of cellulose sample (positive control) biodegraded into carbon dioxide. Also, after 12 months of testing, 8 percent of the PLA sample and 6 percent of the low density</p>		

1 Adapted from the ISO/IEC Commenting template. 2 Te = Technical, Ge = General, Ed=Editorial

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
					<p>polyethylene (LDPE) plastic bag (negative control) biodegraded into carbon dioxide. Neither PLA nor polyethylene claim to biodegrade in the marine environment. These two plastics were used for comparison with PHA marine biodegradable plastics.</p> <p>Thus, PHA samples biodegraded in a similar manner as cellulose in the marine environment and at a higher rate than PLA.”</p> <p>Note to Entry. It is acknowledged by the authors of the report that the temperature of the ASTM method exceeds that of ocean water in Southern California. This does not make the test or test result invalid. On the contrary, it is noted that all materials were tested at the same temperature, so that direct comparison of PLA and PHA to cellulose is possible despite the higher temperature.</p>		
PG	233-234	7.1.2	Plastics	Te	Incomplete.	Provide an accepted amount of plastic that is not intentionally added to the product, recognizing the likelihood of contamination during sample acquisition and testing. Provide appropriate references.	
PG	232-257	7.1.2 – 7.1.4	Plastics, Regenerate d Cellulose, and Other Materials	Te	The language contained in lines 227-231 represents the extent to which the IWSFG can address Safety in the Environment and Human Health; specifically, the IWSFG can point to existing national regulations.	<p>Refer to any other information provided by the IWSFG regarding safety in the environment and human health as IWSFG's opinion or recommendation.</p> <p>If language is retained provide references. See comments below regarding Lines 238-254 regarding current references.</p>	
PG	235-254	7.1.3	Regenerate d Cellulose	Te	Unsupported. Laboratory test results (using both the INDA/EDANA FG-505A and OECD 301B tests) and field testing results for substrates containing regenerated cellulose have consistently demonstrated that regenerated cellulose degrades biologically at a rate similar to, and at times	<p>Delete.</p> <p>If retained, provide the results of laboratory testing conducted by, or on behalf of the IWSFG that shows regenerated cellulose does not degrade biologically.</p>	


¹ Adapted from the ISO/IEC Commenting template. ² Te = Technical, Ge = General, Ed=Editorial

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
					<p>exceeding, the rate of the degradation of pulp fibers. This is further supported by references in the literature to the biological degradation of regenerated cellulose under various conditions. This evidence contradicts the entire premise of the IWSFG position on regenerated cellulose.</p> <p>Note to Entry: The presence of fibers assumed to be regenerated cellulose from field samples is not evidence that regenerated cellulose cannot be degraded biologically. Insufficient information regarding the fibers observed is available to make such a determination. Note that nearly all of the fibers recovered in published studies have been dyed various colors, indicating that the fibers, regardless of their composition, likely originated from clothing, and not from wipes of any kind.</p> <p>Note to Entry: There is no evidence that regenerated cellulose “is of increasing concern due to their potential take-up in the food chain” as noted in PAS-0. In fact, the Reference (#2) cited in PAS-0 to prove this point contains the exact opposite conclusions. Specifically, the following conclusions were reached by the authors of Reference #2 (and Reference #53 within Reference #2):</p> <ol style="list-style-type: none"> 1. The [viscose] fibers are quickly evacuated through normal digestion processes by the invertebrates. 2. The viscose fibers are not transmitted from lower to higher trophic levels. 3. Viscose fibers are digestible and degradable. This favors nonaccumulation or transmission 4. Viscose fibers have been shown to biodegrade under a range of tests and conditions. 		

1 Adapted from the ISO/IEC Commenting template. 2 Te = Technical, Ge = General, Ed=Editorial

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
					5. Rayon fibers, which have a low crystallinity and a low degree of orientation, showed the highest biodegradability in most cases, compared to cotton, including in an activated sewage sludge test.		
PG	256	7.1.4	Other materials	Te	Contradictory	Provide IWSFG's position on the use of minerals (including clay) in cosmetics and cleansers that go down the drain via the sink.	
PG	261-270	7.2	Criteria Two: Toilet and Drain Line Clearance	Te	Contradictory	The acceptance criteria is contradicted in multiple locations within both PAS-2A and PAS-2B.	
PG	278-288	7.2.3	Drain Line clearance – Snagging	Te	PAS-2C was deemed inadequate for inclusion in IWSFG Standard 1.	Delete. If Lines 278-288 are retained, change the phrase from "To be acceptable" to "It is suggested."	
PG	293-294	7.3	Criterion Three: Disintegration	Te	Contradicts Lines 175-177 from Section 6.1	Revise to read "a flushable product can fail two of the three disintegration tests and still qualify as a flushable product per the IWSFG."	
PG	290-354	7.3	Criterion Three: Disintegration	Te	Eliminate duplicate criteria for disintegration tests.	For all disintegration methods, select a single pass criteria.	
PG	290-354	7.3	Criterion Three: Disintegration	Te	Proposed criteria lack appropriate justification and are unsupported.	Delete.	
PG	292-294	7.3	Criterion Three: Disintegration	Te	The PAS-3 series tests do not "set out... maximum fragment size." Clarify the maximum fragment size proposed by IWSFG for disintegration. Attached below is a photograph of a one-ply toilet	Clarify or delete. If no maximum fragment size is provided, delete Lines 292-294. If this "maximum fragment size" differs from the 6.3mm endpoint required in the PAS test methods, provide an explanation, including the results of	

¹ Adapted from the ISO/IEC Commenting template. ² Te = Technical, Ge = General, Ed=Editorial

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
					<p>paper after 30 minutes in the PAS-3B slosh box test.</p> <p>Per PAS-3B, this sample was pre-conditioned and as such this photograph represents the condition of the toilet paper after being flushed through a toilet, transit through a 24-meter drainline, sitting in room temperature tap water for 15 minutes, and 30 minutes of agitation in room temperature tap water in the slosh box.</p>  <p>Note that based on the 1" x 1" grid drawn on the bottom of the slosh box there are a number of pieces of the substrate that have dimensions larger than 1" and are larger than 1" x 1" square.</p> <p>After 2 hours, the average percentage (n=3) of the</p>	<p>laboratory testing that were used to establish the relationship between "maximum fragment size" and the 6.3mm endpoint of the PAS-3 series tests.</p> <p>Provide the results of laboratory testing for all materials (including but not limited to toilet paper, wipes labeled as flushable and baby wipes) that were used to establish the relationship between "maximum fragment size" and the 6.3mm endpoint of the PAS-3 series tests.</p> <p>Based on testing using the PAS-3 series tests, the methods and the currently proposed acceptance criteria are inappropriate and require revision.</p> <p>Conduct an appropriate interlab testing program utilizing a range of products.</p> <p>Once complete, establish relationships between laboratory test method results and infrastructure compatibility issues experienced based on field studies and documented issues to determine appropriate test conditions and acceptance criteria.</p>	

1 Adapted from the ISO/IEC Commenting template. 2 Te = Technical, Ge = General, Ed=Editorial

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
					<p>initial dry weight of the sample passing the 6.3 millimeter sieve specified by PAS-3B was 79%.</p> <p>Therefore, based on the proposed PAS-3B acceptance criteria, this substrate (again, a single-ply toilet paper) would not be considered flushable in accordance with the IWSFG.</p> <p>In conclusion, based on the results of testing to evaluate the applicability of PAS-3B, the PAS-3B test should be withdrawn and critically reviewed before publishing for use.</p>		
PG	292-294	7.3	Criterion Three: Disintegration	Te	<p>Independent laboratory testing of multiple toilet paper samples was conducted at three laboratories to evaluate interlab variability of the proposed PAS-3 series tests.</p> <p>Five toilet papers were tested using the three PAS-3 series tests.</p> <p>Results:</p> <ol style="list-style-type: none"> Three of five toilet papers tested did not meet the acceptance criteria for all three PAS-3 series disintegration tests. Two of the three samples tested failed to meet the proposed acceptance criteria across all three laboratories, but did meet the acceptance criteria at one laboratory in one test. In summary, two substrates that failed to meet the proposed acceptance criteria for eight of nine tests conducted across three laboratories would, according to Section 7.3, be flushable. Put another way, two substrates that failed to meet the proposed acceptance criteria in 89% of tests conducted would meet the IWSFG criteria for dispersibility. 	<p>Based on an inter-lab evaluation of the PAS-3 series disintegration tests, the tests give inconsistent results across laboratories, and therefore are not suitable for publication as written- both the methods and the currently proposed acceptance criteria must be revised.</p> <p>Conduct an appropriate interlab testing program utilizing a range of products.</p> <p>Once complete, establish relationships between laboratory test method results and infrastructure compatibility issues experienced based on field studies and documented issues to determine appropriate test conditions and acceptance criteria.</p>	

¹ Adapted from the ISO/IEC Commenting template. ² Te = Technical, Ge = General, Ed=Editorial

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
PG	387-419	7.5.1 7.5.2	Aerobic Biodisintegr ation Anaerobic Biodisintegr ation	Te	No evidence provided supporting replacement of the 1mm sieve with a 600-micron sieve for PAS-5A and PAS-5B for evaluation of products, in particular for establishing benchmark performance of toilet paper.	Provide reference to laboratory testing conducted by an ISO-accredited laboratory on behalf of the IWSFG, demonstrating evidence supporting selection of a 600-micron sieve.	
PG	424-426		Bibliograph y	Te	<p>Contradictory. Reference 2 of the Bibliography (When Microplastic is Not Plastic: The Ingestion of Artificial Cellulose Fibres by Macrofauna Living in Seagrass Macrophytodebris, Environmental Science and Technology, 2015, 49, 11158-11166, American Chemical Society) contains the following conclusions, contradicting the IWSFG position on regenerated cellulose:</p> <ol style="list-style-type: none"> The fibers are quickly evacuated through normal digestion processes by the invertebrates. "Vagile P. oceanica litter macroinvertebrates show no significant seasonal, spatial, or color trends in the ingestion of viscose fibers. Even though 27% of sampled organisms contained 1 or more artificial fibers, the average amount of artificial fibers in each individual digestive tract was small (1.38 fiber) which is relatively low and could therefore indicate the small retention time of these fibers in the guts of the sampled invertebrates." The viscose fibers are not transmitted from lower to higher trophic levels. "It has recently been demonstrated by in vitro studies that microplastics can be transferred in invertebrates from one trophic level to another.^{50,51} Plastics can be translocated to consumer tissues and then be transmitted to the predator or directly be transmitted from the 	<p>Delete reference.</p> <p>If retained, modify text to reflect conclusions drawn in Reference #2 and associated references therein.</p>	

1 Adapted from the ISO/IEC Commenting template. 2 Te = Technical, Ge = General, Ed=Editorial

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
					<p>consumer's digestive tract to the predator's digestive tract.⁵¹ The observed viscose fibers thus do not seem to be transmitted from lower to higher trophic levels via predation.”</p> <p>3. Viscose fibers are digestible and degradable. This favors nonaccuulation or transmission. “One of the main possible explanations could be related to the lower retention time of the nonplastic observed fibers here in the gut. Indeed, cellulose, even of artificial origin like viscose, is more digestible and degradable⁵² than plastic. Some marine invertebrates are known to be able to digest cellulose, and this could explain both the faster digestive transit of the fibers^{45–47} and the absence of accumulation. The small average amount of AFs found in the invertebrates' gut contents also seems to favor this nonaccumulation or transmission.”</p> <p>4. Viscose fibers have been shown to biodegrade under a range of tests and conditions. “In addition, viscose fibers are known to degrade more rapidly (100% in 8 weeks) than cotton fibers, both by sunlight or in soil when buried.^{52–54}”</p> <p>Lines 424-426. Contradictory. Further, Reference #53 (Park, C. H.; Kang, Y. K.; Im, S. S. Biodegradability of cellulose fabrics. J. Appl. Polym. Sci. 2004, 94, 248–253), which is referenced within Reference 2 of the Bibliography (When Microplastic is Not Plastic: The Ingestion of Artificial Cellulose Fibres by Macrofauna Living in Seagrass Macrophytodetritus, Environmental Science and Technology, 2015, 49, 11158-11166, American</p>		

1 Adapted from the ISO/IEC Commenting template. 2 Te = Technical, Ge = General, Ed=Editorial

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
					<p>Chemical Society) contains the following conclusions, contradicting the IWSFG position on regenerated cellulose:</p> <ol style="list-style-type: none"> 1. Conclusion: “Rayon fibers, which have a low crystallinity and a low degree of orientation, showed the highest biodegradability in most cases” compared to cotton, including in an activated sewage sludge test. <p>“ABSTRACT: Biodegradability of cellulose fabrics was evaluated by use of a soil burial test, an activated sewage sludge test, and an enzyme hydrolysis. Surface changes after biodegradation were observed by optical microscopy. From X-ray diffraction analysis (XRD), changes in the crystallinities and the internal structures as a result of degradation were also investigated. It was shown that biodegradability decreased in the following order: rayon > cotton >> acetate. Rayon fibers, which have a low crystallinity and a low degree of orientation, showed the highest biodegradability in most cases. However, in spite of its low crystallinity, acetate fibers exhibited very low biodegradability, probably because of the presence of hydrophobic groups in its structure. On the other hand, linen showed an inconsistent behavior in that it had the highest biodegradability in the soil burial test, but a lower biodegradability than that of cotton in the activated sewage sludge test. XRD analysis revealed that there was a slight increase in the crystallinity of linen, cotton, and rayon fabrics at the initial</p>		

1 Adapted from the ISO/IEC Commenting template. 2 Te = Technical, Ge = General, Ed=Editorial

IWSFG Template for Reviewer comments and IWSFG secretariat observations¹

Document reviewed: IWSFG Standard 1: 2017 - Criteria for recognition as a flushable product.

Due Date: 2017-09-01

Initials	Line number (e.g. 17)	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment ²	Comments	Proposed change	Observations of the secretariat
					stage, but a continuous decrease thereafter. From the correlation analysis, it was revealed that the biodegradability of cellulose fabrics was closely related to the moisture regain of the fibers, which reflects the hydrophilicity and internal structure of the fibers at the same time.”		
PG	436-440		Bibliography	Ge	References not cited in the document.	Delete. If the references are retained, provide proper citations within the text.	

¹ Adapted from the ISO/IEC Commenting template. ² Te = Technical, Ge = General, Ed=Editorial