

Review Comments by Governments on Second Order Draft of Volume 5 of 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories

Comment ID	Volume	Chapter	From line	To line	Comment	Country	Response	Authors note
5220	5	2	122	134	In the text (as in lines 146 to 147) you added information on VSS (and TSS), and type of sludge (raw/stabilized). But in table 2.4 A there is no link with this information although it is said that "it is good practice to differentiate [...]". So I don't really understand what for this information on TSS and VSS is provided. If it is for referencing purpose of the DOC values, it could be more transparent just to add the information as a note in the table 2.4A. Moreover, if it is good practice to differentiate between raw and stabilized sludge, UNFCCC reviews will expect annex 1 countries to do it. Please could you provide separate defaults values for carbon content, nitrogen content and DOC ?	France	Accepted	See comment 4918
5218	5	2	128	128	It is indicated in the text that it is "good practice to split between "BIODEGRABLE" and "FOSSIL" shares...". Do you mean between "biogenic" and " fossil" ? I guess yes (for CO2 emissions purpose), so it will be more transparent and consistent with the other part of the GL to use this wording "biogenic".	France	Accepted with modification	See comment 4916
904	5	2	139	139	Data in Table 2.3 for some region are more than 100% when add composition together (off by 0.1-0.2%).	Thailand	Accepted with modification	Footnote number 2 below the table explains the reasons for such discrepancy.
6424	5	2	139	139	These data might also be reconsidered. Due to its previous carbon pricing policy, Australia put a lot of work into composition estimates. Estimates used in Australia are: food 0.35; paper & cardboard 0.13; garden and park 0.165; wood 0.01; textiles 0.015; sludge 0; nappies 0.04; rubber & leather 0.01. Inert waste fractions can be derived from the national waste report workbook ('other national data'): metals 0.03; plastics 0.12; glass 0.04.	Australia	Rejected	The data used for Australia in table 2.A.2 is from the 2018 NIR of Australia. The proposed reference by the reviewer is from 2008 and therefore is not upto date compared to the 2018 NIR.
6426	5	2	139	139	Inert waste fractions can be derived from the national waste report workbook ('other national data'): metals 0.03; plastics 0.12; glass 0.04.	Australia	Rejected	The data used for Australia in table 2.A.2 is from the 2018 NIR of Australia. Although the proposed reference is a recent one, the 2018 NIR of Australia is more recent and for consistency purposes, it is appropriate to use the same reference for all waste composition values.
6792	5	2	144	145	It may be useful to consider the carbon content in sludge in more details taking into account new information from the Chapter 6 and Annex 6A.1 Volume 5 on fossil carbon content in wastewater and sludge.	Russian Federation	Accepted with modification	Annex 6.1 was reviewed and carbon content of sludge was confirmed as correct.
6794	5	2	146	147	TSS and VSS are characteristic of sludge from all wastewater treatment operations, not only from wastewater plants. It is also may be important to note that VSS in general case can also include soluble particles.	Russian Federation	Accepted with modification	The section 2.3.2 was fully redrafted to clarify the TSS and VSS issues.
6796	5	2	148	153	It is proposed to rewrite this paragraph omitting the information included in the Table 2.4A	Russian Federation	Accepted	The section 2.3.2 was fully redrafted.
6798	5	2	154	157	The proposed method for calculating DOC content in sludge should be checked because most of the carbon usually is contained in VSS (may be differ only for some types of industry sludge) so calculated results for DOC would be lowered.	Russian Federation	Accepted with modification	The total carbon is used, including carbon in inorganic fraction of sludge. Most of the degradable carbon is contained in VSS.
6800	5	2	156	157	According to the definition VSS is measured in mg/l so it would be better to reformulate this paragraph by clarifying the use of percentages.	Russian Federation	Accepted with modification	The VSS used is a percentage of TSS. This approach allows comparison of sludges with various VSS in mg/l.
6802	5	2	156	157	It is proposed to clarify whether it is possible to use these values in the calculations by default and also whether the value of carbon content be different in raw and stabilized sludge.	Russian Federation	Accepted with modification	Session 2.3.2 was revised and provides clear guidance on the use of VSS. In addition, Table 2.4A divides domestic sewage sludge into treated and untreated sludge to avoid confusion
6804	5	2	161	162	It is proposed to check difference in data for sludge carbon content in the Table 2.4(New) Chapter 2 and Table 5.2 (UPDATED) Chapter 5 Volume 5 and explain or change them.	Russian Federation	Accepted	Value in table 5.2 was updated.
6806	5	2	161	162	There is a difference in the unit for DOC between the title of the Table 2.4A and the corresponding table column (percent of dry matter and fraction) that should be corrected. Also using different units for DOC and other sludge components can be a reason for mistakes.	Russian Federation	Accepted	Text in the table was updated.
7644	5	2	161	162	DOC fraction default value has changed significantly (too much) for domestic sewage sludge in Table 2.4A (now 0.16, earlier 0.4-0.5 in 2006 IPCC Guidelines). In addition, the difference between carbon content and DOC fraction is too large for domestic sewage sludge and for WWT sludge in paper industry. Please check/revise	Finland	Accepted with modification	DOC in domestic sewage sludge was verified. The value of DOC in paper industry was revised according to literature. Carbon content of domestic sludge was separated into treated and untreated process for clearer guidance.

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6808	5	2	177	181	In the current version of Chapter 4 (Volume 5) the appropriate process for anaerobic sludge stabilization is called "Anaerobic digestion" (and in the Chapter 6 also) so it would be better to indicate it in this text more clearly.	Russian Federation	Accepted	The terminology was cleared the term anaerobic digestion is used in the guidelines.
6810	5	2	177	181	In the Chapter 4 (Volume 5) is stated that "when sludge from wastewater treatment is transferred to an anaerobic facility which is co-digesting sludge with solid municipal or other waste, any related CH4 and N2O emissions should be reported under this category, biological treatment of solid waste. Where these gases are used for energy, then associated emissions should be reported in the Energy Sector" so the existing text should be supplemented by this information.	Russian Federation	Noted	Box 2.1 A was reviewed and not appear in the final draft.
1824	5	2	188		In the 10th and 11th rows of the table, 'Hong Kong' and 'Macao' are inaccurately worded. It is suggested to rephrase the former as "Hong Kong, China", and the latter as "Macao, China".	China	Accepted	In accordance with UN classification for geographic regions, 'Hong Kong' will be changed to 'Hong Kong Special Administrative Region, China' and 'Macao' will be changed to 'Macao Special Administrative Region, China'.
5222	5	2	189	189	In order to increase the transparency of annex 2A2, please add a table including the title of column at the beginning of each column.	France	Accepted	Corrected as suggested.
5224	5	2	189	189	Table 2A2 : Please consider that, for many countries, the default value for the category "other" is very high. Considering the list of of waste (ligne 122), this category is supposed to include "(2) garden waste", "(6) nappies" and "(11) other (e.g. ash, dirt, dust, soil, electronic waste). So, this category covers type of wastes very different in terms of DOC, carbon content (FC) and fossil carbon content (FCF) (see 2006 GL, vol 5, Chap 2, table 2.4) and therefore in terms of CH4 emission . There is a riskq that countries make a link between the "other" category in the composition table (2A2) and the "other, inert waste" category in table of default values proposed in the the2006 GL . This would result in an underestimation of emissions.	France	Accepted	Please see comment 4922.
5226	5	2	189	189	Waste composition provided for France is supposed to come from Dong Qing Zhang et al. (2010) "Municipal solid waste management in China: Status, problems and challenges". This document does not include any waste composition for France. Please check the references.	France	Accepted	Please see comment 4924.
6428	5	2	289	289	Change: 'Approved CDM methodology' to: 'The approved CDM methodology'.	Australia	Accepted	SOD Volume 5 Chapter 2 from lime 191-395 are references section. This comment is belong to Chapter 3 which is revised as suggested in the final draft.
6430	5	2	293	293	Change: 'Aerobic pathway' to: 'The aerobic pathway'.	Australia	Accepted	SOD Volume 5 Chapter 2 from lime 191-395 are references section. This comment is belong to Chapter 3 which is revised as suggested in the final draft.
6432	5	2	300	300	Change 'woking' to 'working'	Australia	Accepted	SOD Volume 5 Chapter 2 from lime 191-395 are references section. This comment is belong to Chapter 3 which is revised as suggested in the final draft.
6434	5	2	301	301	Change 'duffusively' to 'diffusively'	Australia	Accepted	SOD Volume 5 Chapter 2 from lime 191-395 are references section. This comment is belong to Chapter 3 which is revised as suggested in the final draft.
6436	5	2	307	307	Change: 'Anaerobic pathway' to: 'The anaerobic pathway'. (In general, the new text would benefit from a spellcheck and edit by a native English speaker.)	Australia	Accepted	SOD Volume 5 Chapter 2 from lime 191-395 are references section. This comment is belong to Chapter 3 which is revised as suggested in the final draft.

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5214	5	2	62	62	Table 2.1 - note 2 : "the per capita values should be multiplied with the population WHOSE WASTE IS COLLECTED [...] this encompasses ONLY urban population." In the view of an inventory compiler for waste, capacity building to non annex 1 countries, this is not complete: rural population is also generating waste (maybe with another generation rate than urban one). These waste, even when not collected, are in some cases discharges in collective dumps out of the villages where anaerobic decomposition definitely occurs. These emissions must be considered in the inventory to ensure completeness. Otherwise there is an underestimation. Therefore, in this view, the production ratio has to be multiplied with the TOTAL national population AND, the fact that a part of rural waste may not be disposed in dump/landfills could be considered using the parameter "fraction of MSW disposed to SWDS" (and therefore has to reflect that a part of national waste is not collected) OR could be considered using an additional national parameter "fraction of waste collected").	France	Noted	See comment 4912 above.
5216	5	2	62	62	Do the proposed default generation rates correspond to waste generated by the national population only ? What about very touristic areas/countries (islands especially) where a fraction of waste is generated by tourists ? Not considering tourists in the estimation of the amount of waste disposed in landfills may lead to an underestimation.	France	Noted	See comment 4914 above.
6582	5	2	64	64	Unnecessary 1 or 1 after "material recovery"	United Kingdom (of Great Britain and Northern Ireland)	Accepted	The "1" has been deleted.
6790	5	2	79	80	Information on the carbon content in sludge is also used in the Chapter 5 Volume 5.	Russian Federation	Accepted	Text has been modified to refer to chapter 5, volume 5
6422	5	2	99	99	The data presented for waste generation in Australia and New Zealand are not accurate. Better numbers, at least for Australia (which is 80% of Australia and New Zealand) are: MSW generation 0.57 t/person; fraction open dumped 0; fraction to landfill 0.58; fraction incinerated 0; fraction composted 0.21; fraction to other 0.21.	Australia	Accepted with modification	The data in table 2.1 are provided for the year 2010 for all countries for consistency purposes in the table. In case the country has more updated data as with the case of the quoted reference which provides data for the year 2016, countries may use such update data for years beyond 2010 while compiling their inventories to enhance the estimate of their time series.
6584	5	2	99	99	The text mentioned italics in table 2.1, but the table doesn't have any	United Kingdom (of Great Britain and Northern Ireland)	Accepted	The text has been modified to clarify that for developing countries using regional waste generation rates provided in the updated Table 2.1 and for developing countries in italics in the Table 2 A.1, the generation rates should be multiplied by the urban population only to obtain the total waste generated in the country since these rates assume that the waste is generated by urban population only and not rural population.
7646	5	3	152	153	It would be much better if the types of waste in Table 3.0 were according to Table 3.3 in 2006 IPCC Guidelines (grasses should be moderately decomposable and textiles and paper are missing now).	Finland	Noted	The waste types in Table 3.0 are classified based on the degradability of waste whereas those in Table 3.3 of 2006 IPCC Guidelines were classified based on their degradation rate (k value). Those two classification may not necessary match each other. For example, grass is reported to be highly decomposable but its degradation rate is only moderate. Paper and textile are included in the table under moderately decomposable waste category.
6812	5	3	165	166	The description of Facultative lagoons (first note 1, now at the bottom of the page) would be better to move inside of the Table 6.1.	Russian Federation	Accepted	The text has been updated.
4796	5	3	175		A guidance to adopt new MCFs by management status is necessary for the actual estimation of emissions from this category. 1) To adopt MCFs of well-managed site, periodical monitoring of management status for each disposal site is thought to be necessary. When there is not any information for management status of disposal sites, MCFs should be treated conservatively as "poorly managed". Clearly describing is better.	Japan	Accepted	Agree that the proving the "appropriateness" should be only achieved by monitoring or other relevant management data. We have added corresponding sentence in this part.

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5234	5	3	191	191	3 categories of SWDS have been added in the table. The "poorly managed semi-aerobically SWDS" is defined with very detailed managing conditions. These conditions may be known at the level of one site but could not be estimated at the national level. Even if a questionnaire is sent to the SWDS (for those which are not closed yet) the fraction of waste disposed in such condition may evolve from one year to another. Do you have examples of countries, having such a precise and exhaustive historical dataset of managing parameters of its landfills ? ...so, the criteria defining if a site is "poorly managed" is too "micro" (level of a site) and should be more "macro" to become really applicable by inventory compilers.	France	Noted	In the countries that dispose the waste into SWDS with different type of management, such as Japan, survey on the ratio of each category of management is conducted and the results are reflected to their inventory.
6438	5	3	286	289	Wastewater treatment and processing plant design has produced many different styles and layouts of wastewater treatment systems. The use of a single emission factor does not reflect the reality of each treatment plant's operational dynamic. Perhaps a range of Emission Factors and Methane Correction Factors should be provided to allow a tailored calculation that is more appropriate to each style and type of treatment plant?	Australia	Accepted with modification	Where there are sufficient data to do so, we have provided emission factors and/or methane correction factors (MCFs) in Chapter 6, Table 6.3 for additional types of treatment systems, as well as a range associated with updated MCFs. We have now added ranges to the emission factors presented in the table as well.
6442	5	3	286	289	Currently the methods to calculate methane production rely on measures of COD/BOD multiplied by emission/correction factors. Is it clear that the tier 3 method allows for direct measurement of methane from a facility or sub-facilities? Technology allows the mapping of gas flux in 3D providing a more accurate measure of the true fugitive emissions and sources.	Australia	Accepted	Updated Figure 6.2 identifies Tier 3 where facility-specific data and a country-specific method are available.
6440	5	3	290	293	Nitrogen removal by means other than sludge is not considered in the calculation of N ₂ O emissions from a wastewater treatment plant. For example in Europe algal ponds are removing nitrogen from wastewater. If algae (Nitrogen) is removed from a treatment plant how can this reduction in nitrogen load be factored into the calculation for N ₂ O production in the wastewater treatment plant unless the nitrogen rich algae are considered sludge?	Australia	Rejected	N ₂ O emission factors have been provided based on the monitoring data of full-scale wastewater treatment plants. Unfortunately, we could not find literature reporting N ₂ O emissions from algal pond systems. However, the amount of nitrogen removed as a solid like algae could be taken into account in the calculation of N ₂ O emission from wastewater effluent discharged to aquatic environments (updated equation 6.8).
6444	5	3	290	293	Technological improvement in instrumentation and measurement has greatly increased the accuracy of measurement in the wastewater industry. As well as reducing the cost of installing automated flow/gas concentration/realtime chemical analysis metering. Currently the methods to calculate N ₂ O production rely on measures of Nitrogen entering and leaving the treatment plant/receiving environment multiplied by emission factors. Is it clear that the tier 3 method allows for direct measurement of N ₂ O from a facility or sub-facility. Direct measurement methods would provide a more accurate measurement of N ₂ O production from each treatment plant and hence inter-plant performance comparisons could lead to optimisation of underperforming wastewater treatment plants.	Australia	Accepted	Direct N ₂ O measurement in each facility is good practice. We have modified the decision tree to more specifically note the use of direct measurement data.
4798	5	3	334	336	The title of Appendix should be changed from "Information on Estimation of CH ₄ " to "Basis for future methodological development on Estimation of CH ₄ " in order to clearly indicate the position of Appendix as technical information for future methodological development.	Japan	Accepted with modification	This appendix handles the information for future development of methodology rather than the basis. Since FOD parameters supported by direct measured data are encouraged to use in 2006 IPCC Guidelines in order to develop the methodology. Therefore we have added the link to it in the sentences to make it
6586	5	3	51	51	Define the acronym SWDS	United Kingdom (of Great Britain and Northern Ireland)	Rejected	It is given in Chapter 1.1, Volume 5.
5228	5	5	111	111	"estimated" should be completed by "and reported"?	France	Accepted with modification	We have changed in line with comment 1704.
5232	5	5	183	183	Could you precise if the default CH ₄ EF proposed in the table 5.3A (new) correspond to EF for the destruction step (gasifier, pyrolysis reactor) or to the complete plants including the energy recovery system ? It is not clear for me as in the pyrolysis scheme you are presenting an "EXTERNAL" energy use of the pyro-gas and in the gasification scheme you are presenting that emissions are from the "energy recovery system". However, you are proposing an EF for both system. In order to increase transparency, you may add the "CO ₂ , N ₂ O, CH ₄ " flow.	France	Accepted	Same as comment number 4930.
5230	5	5	96	96	"commingled" could be replaced by "mixed" ?	France	Rejected	See response to Comment 4928

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914	5	6			Table 6A.2 do not have proper heading.	Thailand	Accepted	Table headings have been adjusted.
7648	5	6	127	154	Methane emission from wastewater discharge (domestic and industrial) to waterways (lakes, reservoirs and others) should be mentioned as a new emission source.	Finland	Accepted	Changes compared to the 2006 Guidelines have been updated and are now located in Section 6.1.5.
910	5	6	162		Solid line in Figure 6.1 may not clearly distinct.	Thailand	Accepted	Figure has been updated.
912	5	6	162		Figure 6.1 has some unusual connecting lines for sludge flow.	Thailand	Accepted	Figure has been updated.
6814	5	6	165	166	Detailed description of emission potential for Septic tanks in the Table 6.1 is lacking.	Russian Federation	Accepted with modification	Table 6.1 has been revised to include an entry for septic tanks (without dispersion fields) and septic systems (including a septic tank and a soil dispersion system). The description of emissions potential for each of these pathways has been improved and further discussion is included in the chapter text.
6816	5	6	165	166	It is proposed checking the use of terms "recovered" and "flared" in the Table 6.1 as according to IPCC guidelines CH4 can be at first recovered and then flared or combusted (for heat/electricity).	Russian Federation	Accepted	Only the amount of CH4 recovered or flared is important for the calculation. How to use the CH4 is just additional information. So the sentence has been revised to avoid confusion.
6818	5	6	165	166	It is proposed to add more clear explanations how to divide sludge treatment between onsite and located elsewhere and add this information to the other relevant Chapters of the Volume 5 also.	Russian Federation	Rejected	The division of emission reporting between on-site sludge treatment and sludge treated elsewhere is not a new issue introduced in the refinement and is therefore out of scope of the refinement. It is impossible to give general advice on whether sludge is treated on site or elsewhere since this depends on local practice and circumstances.
6820	5	6	185	186	The description of Facultative lagoons (first note 1, now at the bottom of the page) would be better to move inside of the Table 6.1.	Russian Federation	Accepted	The text has been updated.
6822	5	6	191	192	It is not clear to which category should be classified unmanaged SWDS with depths 5 m or greater but with low water table in the Table 3.1.	Russian Federation	Noted	No action can be taken because comment is out of scope of 2019 Refinement.
7660	5	6	213	219	The matter that sludge removal is needed in the calculation method to describe the situation when organic matter that would normally be removed by the system instead pass through and are discharged to the aquatic environment is false. Instead, this matter is described accurately when measured BOD load values into waterways are used (instead of Table 6.13 and Equation 6.3D). Particularly, these measured values are monitored in many countries since the permission procedures obligate that.	Finland	Accepted with modification	Countries possessing data on the BOD of treated wastewater from plants are welcome to use this in a tier 3 method of their choosing. The guidelines cannot describe every potential tier 3 method nor point out every place they can be used. This text relates to the Tier 1 method. Equation 6.1A has been revised to include TOW_EFFtreat to provide an explicit way to estimate the discharge of organic matter to waterways in the absence of plant data. For overloaded plants, additional methane emissions are expected from both the plant and the receiving environment. Updated equation 6.1 and new equation 6.1A will reflect this situation. Countries with the ability to do so can replace the estimated TOW_EFFtreat with monitoring data for more accurate results.
6824	5	6	259	268	There is no explanation how to consider emissions from wastewater discharges that are not enter aquatic environment (for example, some industrial wastewater, effluents from septic tanks and latrines).	Russian Federation	Accepted	Emission factors for CH4 and N20 emissions from discharges that do not enter aquatic environments have been added to Tables 6.3 and 6.15 for domestic WW and to Table 6.8 for industrial WW. In addition, discharge to non-aquatic environments has been added to Table 6.1.
6826	5	6	289	292	It is proposed to check using of terms "recovered" and "flared" because according to guidelines CH4 can be first recovered and then flared or combusted (for heat/electricity).	Russian Federation	Accepted with modification	Only the amount of CH4 recovered or flared is important for the calculation. How to use the CH4 is just additional information. So the sentence has been revised to avoid confusion.
6828	5	6	293	294	If data in the Table 6.13 include loss of organic matter to sludge and they are default then default data for sludge removal as 0 is mostly incorrect or need additional explanation.	Russian Federation	Accepted	The new approach presented in this refinement is not based on default S=0 and the text has been updated to reflect this.
6830	5	6	310	324	It is proposed to consider adding additional steps for calculating emissions according to the methodology given in the Chapters 3, 4, and 5 (Volume 5) but included in this sector.	Russian Federation	Accepted with modification	The text gives clear references which methodology to use based on the treatment systems used on site. In addition, Step 4 has been added to the text instructing how to estimate emissions from anaerobic digestion.
4802	5	6	329, 564, 62		In the termination of the decision trees, there are a description of "Are activity data available to categorize discharge by type of waterbody?" or "Are activity data available to categorize discharges to hypoxic environments?" when we use Tier 1a emission factors. 1) It is necessary to provide a guidance to categorize and collect activity data for each waterbody to which wastewater is discharged.	Japan	Accepted	We have revised our previous approach and have now provided additional guidance on the types of activity data which allow for receiving environments to be categorised as "nutrient-impacted" or otherwise. We have also provided guidance on the types of activity data and where to find existing data (including examples of existing databases online for some global regions) to help classify wastewater discharge receiving environments by type ("nutrient-impacted" or "non-impacted"). The methodology has also been revised to a Tier 3 method and provided with new guidance as above.

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6832	5	6	387	406	There is no explanation how to consider emissions from wastewater discharges that are not enter aquatic environment (for example, some industrial wastewater, effluents from septic tanks and latrines).	Russian Federation	Accepted	Emission factors for CH4 and N2O emissions from discharges that do not enter aquatic environments have been added to Tables 6.3 and 6.15 for domestic WW and to Table 6.8 for industrial WW. In addition, discharge to non-aquatic environments has been added to Table 6.1.
6834	5	6	438	439	It is proposed to consider the possibility of adding specific emission factor for sludge digestion in Chapter 4, because value for DOC and N content in sludge is significantly differ from the one adopted in the existing evaluation used in the Table 4.1.	Russian Federation	Rejected	The DOC of sludge was updated and considering the range of emission factor we do not consider to introduce a specific parameter for sludge.
6836	5	6	438	439	It is proposed to check difference in data for sludge carbon content in the Table 2.4(New) Chapter 2 and Table 5.2 (UPDATED) Chapter 5 Volume 5 and explain or change them.	Russian Federation	Accepted	Value in table 5.2 has been changed in relation to table 2.4A (New)
7656	5	6	453	501	The method for calculating activity data is incorrect. Sludges removed mainly at the end of the process cannot have considerable effects on emissions occurring mainly at the beginning of the process. The incoming load to wastewater plants without any sludge removals describes the activity needed for wastewater plants much better and at least, it does not lead to underestimated emissions. In addition, it is hard to think that sludge removal activity data in different stages (Table 6.12) could be obtained in any country.	Finland	Noted	The Eq. 6.1 applied on aerobic WWTP assumes that organics removed as sludge were converted to sludge through aerobic process, thus only remaining organics may be a source for emissions. We are not requesting countries to obtain the data suggested, but to provide characterisation of data on sludge they use for emission estimation.
6838	5	6	469	470	It would be better to add information is these data in the Table 6.12 for dry or wet sludge.	Russian Federation	Accepted	All data are based on dry mass of sludge and the table has been revised to make this clear.
7654	5	6	502	513	Please reconsider Equation 6.3C. As there are no definition or guidance what the sludge removal instructions should be like, the parameter F i.e. the fraction of the population managing their septic system in compliance with these (undefined, national?) instructions remains undefined and fuzzy.	Finland	Rejected	Equation 6.3C proposed a default tier 1 methodology to estimate the amount of TOW removed as sludge in septic tanks. Septic tanks/systems typically include instructions on the frequency of sludge removal depending on the size of the tank and the number of people connected to the tank. In the absence of country-specific information, it is considered in the methodology that 50% of the population manage their septic tanks in compliance with the sludge removal instructions (F=0.5). This explanation was provided from line 471 to 478 of the SOD but some modification were made in the final version.
7658	5	6	515	529	It should be mentioned that instead of Equation 6.3D and Table 6.13 directly measured BOD values into waterways should/could be used in countries having comprehensive statistics.	Finland	Accepted with modification	If users have facility-specific data and/or a country-specific method, then you should be using higher tier methods (Tier 2 or 3). This is now clarified in the decision tree Figure 6.2
6840	5	6	528	529	It is not clear how data from the Table 6.13 take into account the removal of organic matter with sludge as in the lines 293-294 it is considered that default for sludge removal is 0 (except for septic tanks). So using them with the real data for sludge removal need additional explanation.	Russian Federation	Rejected	Default S=0 is no longer applicable and the text has been revised (see introduction to chapter 6). The text after the table states that the data "include loss to sludge and biological decomposition."
6842	5	6	561	562	It would be better if industry type classification in the Table 6.14 coincide to industry type classification in the Table 6.9 or additional explanation should be added.	Russian Federation	Rejected	Regarding the values on table 6.14, and upon further review of the data source, we have determined these values represent emission factors for specific industry wastewater treated in an anaerobic digester, and have removed them from the chapter.
6844	5	6	568	568	There is no explanation how to consider emissions from wastewater discharges that are not enter aquatic environment.	Russian Federation	Accepted	Emission factors for CH4 and N2O emissions from discharges that do not enter aquatic environments have been added to Tables 6.3 and 6.15 for domestic WW and to Table 6.8 for industrial WW. In addition, discharge to non-aquatic environments has been added to Table 6.1.
6846	5	6	583	591	There is no explanations how to consider emissions from wastewater discharges that are not enter aquatic environment (for example, effluents from septic tanks and latrines), especially taking into account information in the lines 238-239 and 243-244 Chapter 6 Volume 5.	Russian Federation	Accepted	Emission factors for CH4 and N2O emissions from discharges that do not enter aquatic environments have been added to Tables 6.3 and 6.15 for domestic WW and to Table 6.8 for industrial WW. In addition, discharge to non-aquatic environments has been added to Table 6.1.
6848	5	6	618	620	It is proposed to clarify the need for summarizing results for wastewater treatments and from effluent because according to the IPCC Guidelines N2O emissions from wastewater treatment effluent are indirect and emissions from wastewater treatment plants is direct.	Russian Federation	Accepted with modification	Emissions from effluent are no longer referred to as indirect emissions as in the 2006 Guidelines to avoid confusion with indirect emissions of N2O from deposition of nitrogen compounds. Emission from effluent is considered as direct emission.

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4800	5	6	677	678	In the new table 6.15, definition of "Hypoxic" is unclear and arise confusion when a Party selects appropriate methodology. Therefore, quantitative criteria of "Hypoxic" should be provided in the table 6.15.	Japan	Accepted with modification	We have revised our previous approach and have now provided additional guidance on the types of activity data which allow for receiving environments to be categorised as "nutrient-impacted" or otherwise. We have also provided guidance on the types of activity data and where to find existing data (including examples of existing databases online for some global regions) to help classify wastewater discharge receiving environments by type ("nutrient-impacted" or "non-impacted"). The methodology has also been revised to a Tier 3 method and provided with new guidance as above. We have also added the terms "hypoxia" and "nutrient-impacted" to the glossary.
6850	5	6	713	717	It would be useful to add explanation that data from Household Surveys can contain information not about all consumed protein in a country but consumed only in households.	Russian Federation	Accepted with modification	The Household Surveys in FAO database do not present sufficient information on protein consumed and reference to them was deleted from the text.
6852	5	6	723	724	It is not clear what set of data from the Table 6.16 inventory compliers will need to use if activity data based on protein available is multiplied by default data for fraction of protein consumed (from the lines 716-717).	Russian Federation	Accepted	The section was reformulated, parameters were simplified, and method of emission estimation was adjusted.
6854	5	6	723	724	In-sink disposal and waste bin disposal in the Table 6.16 need more clear indication in the text (especially terminology "waste bin"). Also it is not clear how to use two Fnon-con factors in the Equation 6.10	Russian Federation	Accepted	The section was reformulated, parameters were simplified, and method of emission estimation was adjusted.
7650	5	6	729	753	It should be mentioned that instead of Equation 6.8 and Table 6.17 directly measured N values into waterways should/could be used in countries having comprehensive statistics.	Finland	Accepted with modification	If users have facility-specific data and/or a country-specific method, then you should be using higher tier methods (Tier 2 or 3). This is now clarified in the decision tree Figure 6.2
6856	5	6	766	768	There is no explanation how to consider emissions from wastewater discharges that are not enter aquatic environment.	Russian Federation	Accepted	Emission factors for CH4 and N2O emissions from discharges that do not enter aquatic environments have been added to Tables 6.3 and 6.15 for domestic WW and to Table 6.8 for industrial WW. In addition, discharge to non-aquatic environments has been added to Table 6.1.
6858	5	6	777	779	It is proposed to clarify the need for summarizing results for wastewater treatments and from effluent because according to the IPCC 2006 guidelines N2O emissions from wastewater treatment effluent are indirect and emissions from wastewater treatment plants is direct.	Russian Federation	Accepted with modification	Emissions from effluent are no longer referred to as indirect emissions as in the 2006 Guidelines to avoid confusion with indirect emissions of N2O from deposition of nitrogen compounds. Emission from effluent is considered as direct emission.
6860	5	6	804	807	There is no explanation how to consider emissions from wastewater discharges that are not enter aquatic environment.	Russian Federation	Accepted	Emission factors for CH4 and N2O emissions from discharges that do not enter aquatic environments have been added to Tables 6.3 and 6.15 for domestic WW and to Table 6.8 for industrial WW. In addition, discharge to non-aquatic environments has been added to Table 6.1.
7652	5	6	850	863	It should be mentioned that instead of Equation 6.14 and Table 6.17 directly measured N values into waterways should/could be used in countries having comprehensive statistics.	Finland	Accepted with modification	If users have facility-specific data and/or a country-specific method, then you should be using higher tier methods (Tier 2 or 3). This is now clarified in the decision tree Figure 6.2
6862	5	6	947	950	The purpose of this statement is unclear, it is necessary to clarify the need for calculation or remove it.	Russian Federation	Accepted with modification	This text was incorrectly labelled as an Annex in the second order draft and this has now been corrected to an Appendix in the final draft, therefore the statement remains relevant for future Guideline development
906	5	Annexes			Annex 2A.2 should have table heading similar to Table 2A.1.	Thailand	Accepted with modification	Correction has been made.
908	5	Annexes			Thailand data in Annex 2A.2 are not officially updated and not originally from corresponding agency in Thailand.	Thailand	Accepted	Updated with data from Pollution control department from Thailand.

Comment ID	Volume	Chapter	From line	To line	Comment	Country	Response	Authors note
1784	General				<p>The Chinese government appreciates and thanks the Bureau members, Lead Authors and the TSU of the Intergovernmental Panel on Climate Change (IPCC) for the Methodology Report of 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories for their hard efforts to prepare this report. In order to make the IPCC assessment report more scientific, comprehensive and balanced, and taking into full account the rationality and operability of the reported findings when they are applied, the national government has put forward the following comments in the hope that they can be adopted in the revision process.</p> <ol style="list-style-type: none"> 1. Erroneous statements of China's sovereignty. There are common sense errors concerning Hong Kong and Macao, China, in the report (Vol. 5, Chapter 2, page 188). Correction must be made to all these errors, including but not limited to those mentioned in proposed amendments in the review comments, and it is hoped that such errors will no longer occur in future reports. 2. Some of the formulas in the report are not rigorous or normative. As it is a widely used methodology report, accurate formulas are especially important. Considering the problems of ambiguity, inconsistent citation and dimensional errors in some of the formulas in the report, it is suggested to correct them altogether. 3. The readability of the report to be increased. There are many problems in the report in terms of linguistic logic, consistency and text editing, especially errors in serial number when mutual or cross quotations occur between unrevised and revised parts. At the same time, for the newly added chapters such as texts on GHG concentration measurement and inversion models, it is suggested to give them the science-based definitions, and indicate the formulas involved and their sources, as well as their application range and uncertainty. For example, 419-420, 540-546 and 607 in Ch-6, Vol1. It is suggest that the overall revision be made to increase the readability of the report. 4. With regard to newly added or revised texts, it is suggested to cite more literature from developing countries to improve the integrity and practicality of the guidelines. 	China	Accepted with modification	<p>Copied from "General" comments.</p> <p>1) These have been corrected in table 2A.1 2) Noted 3) Noted 4) In chapters 2 and 5 references from developing countries have been introduced.</p>