Health care facility

Water supply and management checklist

Supporting material for WASH FIT improvements

Revised version

December 2024

Introduction

This short checklist is meant to be used as part of a wider quality improvement process, including through the Water and Sanitation for Health Facility Improvement Tool (WASH FIT). It focuses on water management and water quality and is meant to help guide those in charge of water services within health care facilities on key tasks and corrective actions.

Sections A and B of this checklist provide templates for systematically collecting and documenting key information on the water source(s) used in the health care facility and any water storage facilities available. Section C provides guidance on essential water quality monitoring and sanitary inspection activities and possible corrective actions that can be taken in response to problems identified. The Annexes contain templates on calculating water volume needs, recording monitoring checks and tracking corrective actions, and relevant sanitation inspection forms. In carrying out the activities, it is important that the specific person(s) are identified and named in order to ensure appropriate accountability and follow-up.

General information

Health facility name_____ Health facility city_____

State/District _____

Name of evaluator(s)_____

Date_____

A. Water Source

Develop an overview of all water sources of water used in the health care facility for different purposes. The uses may be permanent or temporary, and may be from the mains supply, local wells or boreholes in the community or on the site of the health care facility, or trucked water.

Treatment may be applied at the central level by the *Vodokanal* service provider if the supply is from a centralized system. Treatment may also be applied at the level of the health care facility, either in addition to centralized treatment or, for example, if a local, non-centralized source is used.

NOTE: It is important that those responsible for water services in health care facilities establish and maintain close communication with the local *Vodokanal* service provider to confirm the level of treatment provided by the central supply and to receive timely information on any incidents that may compromise water quality and safety.

Water source	**Type**	**Average volume (m3/week)**	**Purpose**	**Treatment onsite and/or offsite**	**Functionality**	**Water quality information**
	Borehole *Shallow well* *Trucked water* *Piped supply*	*Confirmed estimate*	*All uses* *Specific uses only, including drinking, technical/non potable*	*None/unknown* *Reverse osmosis* *Chlorination* *Boiling* *Other*	*Working at full capacity* *Partial capacity* *Not working*	*Available* *Not available*
#1 (name)						
#2 (name)						
#3 (name)						
#4 (name)						
Total available water (m3/week)				Note: Add all sources		
Total water needs (m3/week)				Note: Calculate based on services and needs (see Annex 2)		

B. Water Storage

Develop an overview of all water storage facilities used in the health care facility, including their current capacity and design. Such an overview will help to develop standard operating procedures (SOPs) for routine cleaning and maintenance activities to be used by facility staff to keep storage facilities clean and safe.

Water Storage	**Type** (Rooftop tank, barrel inside building, other)	**Volume** (L) Confirmed estimate	**Purpose** (All uses of specific uses only, including drinking, technical/non potable)	**Treatment onsite** (None/unknown, reverse osmosis, chlorination, boiling, other)	**Current capacity** (Full: >75%; half full 25-75%; limited: <25%; or non-functional)	**Storage covered** (Yes/no)
#1 (name)						
#2 (name)						
#3 (name)						
#4 (name)						

Total Available Water Storage (L)		Add all sources	
Total Water Storage needs (L)-See Annex 2 for reference table		Stored water should supply 48 hours of needs	

C. Regular operation and maintenance, operational monitoring and corrective actions

This sections provides an overview of the key preventative actions or operation and maintenance task as well as what to check and how often for operational monitoring. It also indicates the critical limits and what to if those limits are exceeded (e.g. corrective action). The suggested frequencies are based on normal operating conditions. In the event of partial or complete system failure due to power outage, attack or other cause, sudden change in staff availability, actions will need to be reduced with the priority on obtaining any supply of water. Water quality is the last section (C5) and actions are provided in a progressive order, starting with monitoring that can be done without any water quality testing supplies to monitoring turbidity, chlorine residual and pH to finally where resources and time allow, indicator bacteria monitoring. It is recommended to choose 4-5 critical points on which to conduct water quality checks with the possibility or rotating these points in larger facilities to obtain a more complete understanding of the water quality situation.

C1. Daily activities

System element	Operation and maintenance	Operational monitoring	Where	Critical limit (s)	Corrective action if acceptable limits are exceeded
Borehole/well	-Check and clean borehole facility, including area around seal	-Examine borehole cap to ensure it is tightly fitting	-At pump house	-Debris or materials blocking borehole facility -Borehole cap not tightly fitting	-Remove debris and ensure fencing secure -Add sealant to create a tight fitting borehole cap
	-Check pump is working, repair or replace damaged parts, clean and disinfect pump	-Pump operating at designated power/volume (view meter)	-At pump house	-No power or pumping -High pitched whining noises -Pump warm/overheating	-Determine if non-pumping related to power supply, damage to well or motor or other issue by checking key components of motor -If power issue, connect to back-up supply or work to secure additional power source (e.g. through generator)
		-Check oil levels	-At pump house	-Oil level below indicated range	-Add appropriate oil and volume
	-Network pipe cleaning -Inspect and maintain critical network components (break-pressure tanks, valve boxes, valves).	-Water from main pipe is flowing -Confirm with water supplier that water meets quality standards (e.g. for free chlorine residual, pH, *E. Coli*)	-At main inlet valve	-Low or no flow	-Check main valves and plumbing connections to ensure no leaks within facility -Call water supplier/Vodolkanal to inquire about disruption to services and confirm water quality supplied - If microbiological water quality is in doubt, boil or disinfect water used for drinking and medical purposes (see section C5 on water quality for details)

Taps	-Check all taps in facility for leakage and functionality	-Check all taps in facility for leakage and functionality	-Minimally all taps in bathrooms and select, priority care areas (e.g. intensive care units, maternity units).	-Any water leaking from taps	-Determine what is causing the leak; tighten and/or install replacement parts
	-Check to see sinks draining properly by filling with some water and allowing to drain	-Flow rate of water leaving sink -Debris or any object in drain preventing flow	-See above	-Water doesn't drain or drains very slowly	-Clean drain area using pipe cleaner -Remove sink trap underneath sink and remove any trapped material
Plumbing	-Check to leaks throughout system at critical points (e.g. valves, under sinks, etc)	-Check valves where main supply connects to storage for leakage - Check showers, handwash stations, eyewash stations are functioning correctly and not leaking	-All main valve connections -All showers, handwash and eyewash stations	-Any water leaking from taps	-Determine what is causing the leak; tighten and/or install replacement parts
	-Check toilets to see flushing properly and no leaking tanks	-Proper/expected functioning of toilets	-All toilets	-Any clogged or leaking toilet	-Unclog using plunger or other tool; if still clogged inspect plumbing to determine cause
Drinking-water containers	-Inspect containers for signs of damage, leaks, etc	-Check containers have water, are visibly clean, securely covered and not leaking. - Check that the containers have not been used to store liquids other than drinking-water (including water of lesser quality, detergents, oils, medical-related liquids etc.)	-All containers	-containers empty/no water	-if containers filled manually, check with personnel in charge on why not full and develop plan/actions to ensure regular filling and checking

C2. Weekly Activities

System element	Operation and maintenance	What to monitor	Where	Critical limit (s)	Corrective actions if limits are exceeded
Piped supply from municipal network	-Check to see pipes well buried (to prevent freezing/thawing)	- Check to see pipes well buried (to prevent freezing/thawing)	-Throughout system until pipes enter building	-Pipes exposed	-Replace any eroded earth around exposed pipework
Other (i.e. trucked water)		-Water arrives on schedule and with agreed volume -Confirm with water supplier that water meets quality standards (e.g. for free chlorine residual, pH, *E. Coli*)	-At agreed time/place	-Water does not arrive or arrives in insufficient amounts -Water quality data indicates contamination	-Discuss with health facility management and supplier if agreed schedule/quantity/quality is not being met to decide upon appropriate action - If microbiological water quality is in doubt, boil or disinfect water used for drinking and medical purposes (see section C5 on water quality for details)
Plumbing	-Check septic system for standing water, sludge level	-Check for standing water around septic tank and leach-field	-Septic tank surroundings	-Standing water	-Determine cause of standing water; put in place measures to facilitate drainage
Water storage tanks within facility or on facility grounds	-Inspect tank and tank support base for signs of damage or failure	-Check tanks not leaking, securely covered (including tight fitting access hatches that are closed and locked, if present, and that access hatches are securely fitted and locked (if present).	All large storage tanks inside and on facility grounds.	-water leaking from tank -no cover	-Determine cause/location of leak; repair/replace parts as needed -Close valve to tank to prevent further water entering and leaking -Replace cover
		- Visually check that any overflow pipes or air vents have a functioning vermin-proof screen.	All large storage tanks inside and on facility grounds.	-screens torn or broken	-Replace broken screens
		- Visually check the inside of the tank to ensure there are no visible signs of contamination (e.g. floating material, animal activity, sediment buildup)	All large storage tanks inside and on facility grounds.	-interior of tanks visibly dirty	-Completely draining and clean with detergent and disinfect tanks annually, or more frequently if there is an adverse event (e.g. damage/attack to water supply or tank, indication of contamination based on visual indication

					of the and/or water quality testing-see Section C5 for details)

C3. Monthly or Annually Activities

System element	Operation and maintenance	Operational monitoring	Where	Critical limit (s)	Corrective action if acceptable limits are exceeded
Borehole/well	-Perform detailed inspection of borehole, including screen, for signs of damage **(Annually)**	-Monitor water yield and use to identify changes in production/yield	-At pump house	-Sediment blocking screen -Yield less than expected	-Unclog screen -Rehabilitate borehole (e.g. replace eroded earth around borehole) -Conduct more extensive check of all engine
Plumbing	-Check septic system for standing water, sludge level	-Level of sludge below baffles or not more than 1/3 of tank volume	-Within septic tank	-Higher than expected sludge level	-Arrange for de-sludging service

C5. Water quality monitoring and testing

This section summarizes the key water quality monitoring tasks which are presented in an incremental approach, starting with visual and physical inspections. Where there are resources and available time/staff, pH, turbidity and free chlorine residual should be regular monitored and corrective actions taken if expected values are not met. The most advanced water quality monitoring and testing would include fecal indicator bacteria testing (E. Coli). In addition, depending on the source water quality and agricultural and industrial activities, nitrates may be of concern especially in facilities where water is used to make formula for infants who are at risk of . Finally, lead examinations and actions are highlighted where there lead plumbing may be used and simple tests on temperature and flow may be done to assess optimal conditions and risk of Legionella.

Item/Action (listed incrementally, starting with basic and more advanced)	What to monitor	Where	When	Critical limit (s)	Corrective actions if limits are exceeded
-Visual and physical inspections	- check the taste and odour of the water	-Priority taps[1] -All water storage tanks -All drinking-water containers	-Daily	- The following observed during visual inspection of the water may indicate problems with the water quality: cloudiness (e.g. turbidity); milkiness (e.g. air in the pipes); red/orange tinge or sediment (e.g. iron); brown/black tinge or sediment (e.g. manganese), blue (e.g. copper); eggy odour (e.g. hydrogen sulphide); metallic taste (e.g. general metal contamination)[2].	-For turbidity allow water to settle and decanter (if storage tank or drinking-water containter); before using check to see if sufficient chlorine residual is present -For sediment or other noticeable color for storage tanks and drinking water containers, clean with detergent and disinfect
-Basic quality parameters	-free chlorine residual	-Priority taps -All water storage tanks -All drinking-water containers	-Daily	-free chlorine residual < 0.2 mg/l	-Adjust chlorination to achieve 0.5 mg/l as a precautionary measure
	-turbidity	-Priority taps -All water storage tanks -All drinking-water containers	-Daily	-turbidity > 5 mg/l	-for drinking water containers let water settle and decanter after at least 2 hours; ensure chlorine residual is >=0.5 mg/l
	pH	-Priority taps -All water storage tanks -All drinking-water containers	-Daily	-pH < 6.5 or pH > 8.5	-Adjust pH to achieve range between 6.5 and 8.5
-fecal indicator bacteria testing	-check concentration of *E. coli* (mg/L)	-Priority taps -All water storage tanks -All drinking-water	- Monthly	-> 0 mg/l	-if sufficient water, flush affected water from the pipes and or storage tanks and re-test for *E. Coli* - stop using water for drinking or medical uses until zero *E. coli* is found in the system and a

[1]

[2] Note that there may be multiple causes and/or other causes than those indicated in parentheses.

		containers			sufficient free chlorine residual (> 0.2 mg/l) is recorded. -For point of use drinking water containers explore locally available and affordable treatment options that effectively remove bacteria, protozoa and viruses[3]
-Nitrate testing[4]		-Priority taps -All water storage tanks -All drinking-water containers	-As needed; annually	> 50 mg/l (nitrate)	-stop using water for drinking and medical purposes; seek another water source that meets limits for nitrate or install reverse osmosis or ion exchange system to remove nitrates -before using water test to ensure it is within critical limits
-Lead inspection and testing[5]		-Priority taps -All water storage tanks	-As needed	> 10 mgl/l[6]	-Replace pipes and piping components with low-lead or lead free alternatives (e.g. PVC, uPVD). If lead present and pipes not replaceable in short term, precautionary SOPs may be introduced to promote flushing at critical points.
-Assessing Legionella conditions (temperature, water flow)		-Priority taps -Select water storage tanks	-As needed	< 20 C or > 45 C	-increase power/temperature of hot water heater to achieve > 45 C; if not possible, consider heating less volume of water to achieve higher temperature -check that there are no “dead ends” or areas of low flow; if water supply has been stopped because of attack, lack of power, flush system before using water again.

[3] Refer to the WHO International Scheme to Evaluate Household Water Treatment Options as well as the Ukraine Emergency Water Treatment Standards for performance criteria as well as a list of global products that effectively remove viruses, protozoa and bacteria from drinking water. https://www.who.int/tools/international-scheme-to-evaluate-household-water-treatment-technologies/products-evaluated

[4] Methaemoglobinaemia (also known as blue baby syndrome) is complicated by the presence of microbial contamination and subsequent gastrointestinal infection, which can increase the risk for this group significantly. Authorities should therefore be all the more vigilant that water to be used for bottle-fed infants is microbiologically safe when nitrate is present at concentrations near or above the guideline value. In addition, because excessive boiling of water to ensure microbiological safety can concentrate levels of nitrate in the water, care should be taken to ensure that water is heated only until the water reaches a rolling boil.

[5] Refer to WHO Technical Brief on Lead on how to conduct testing for lead, and remedial actions to consider if present. https://www.who.int/publications/i/item/9789240020863

[6] It is important to note this is a provisional value (as of 2011) as there is no safe level of lead, especially for small children and immunocompromised individuals. Every effort should be made to maintain lead levels in drinking-water as low as reasonably practical and below the guideline value of 10 mg/l when resources are available.

Annexes

Annex 1. Key Resources

WHO/UNICEF, 2022. Water and Sanitation for Health Facility Improvement Tool (WASH FIT). See technical fact sheet #3, plumbing, and Annex 7, sanitary inspection forms. https://www.who.int/publications/i/item/9789240043237

WHO, 2022 . Guidelines for drinking-water quality fourth edition, 2nd Addendum. World Health Organization: Geneva. https://www.who.int/publications/i/item/9789240045064

WHO, 2024. Guidelines for drinking-water quality: small water supplies. World Health Organization: Geneva. https://www.who.int/publications/i/item/9789240088740

WHO, 2024. Sanitary inspection package for drinking-water supplies. World Health Organization: Geneva. https://www.who.int/teams/environment-climate-change-and-health/water-sanitation-and-health/water-safety-and-quality/water-safety-planning/sanitary-inspection-packages

WHO, 2024. WHO International Scheme to Evaluate Household Water Treatment Technologies. https://www.who.int/tools/international-scheme-to-evaluate-household-water-treatment-technologies/products-evaluated

WHO, 2024. Ukraine WASH Readiness Checklist. (publication forthcoming).

Annex 2. Table to estimate water needs

Type of service	**Water needs (L)**	**# patients/week**	**Need x patient**	**Total (L)**
Outpatient	5/consultation			
Inpatient	40-60 /day			
Operating theater or maternity	100/intervention			
Severe acute respiratory disease isolation center	100/patient/day			
Wet supplementary feeding center	15/consultation			
Inpatient therapeutic feeding center	30/consultation			
			Total	

Annex 3a: Operational monitoring template: observations

Operational monitoring template-observationsLocation (Add name/place)	***Observations***				***Actions***		
	Date	**Condition**	**Corrective actions needed**	**Responsible person**	**Date**	**Corrective actions taken**	**Responsible person**
Water Source #1_____							
Water Source #2_____							
Water Source #3_____							
Storage Tank #1_____							
Storage Tank #2_____							
Storage Tank #3_____							
Tap #1_____							
Tap #2 _____							
Tap #3 _____							
Drinking-water station #1_____							
Drinking-water station #2_____							
Drinking-water station #3_____							

3b. Operational monitoring template water quality

Source Water

D: Daily, M: Monthly, A:Annual

Date /time	Source water #1 _____(name)				Source water #2 _____(name)				Source water #3 _____(name)				Correction action /comments	Completed by:
	Turbidity[D] (NTU)	pH[D]	Free Chlorine[D] (mg/L)	e. Coli[M] (mg/L)	Turbidity[D] (NTU)	pH[D]	Free Chlorine[D] (mg/L)	e. Coli[M] (mg/L)	Turbidity[D] (NTU)	pH[D]	Free Chlorine[D] (mg/L)	e. Coli[M] (mg/L)		
Critical limit	**> 5**	**< 6.5 or > 8.5**	**< 0.2**	**>0**	**> 5**	**< 6.5 or > 8.5**	**< 0.2**	**>0**	**> 5**	**< 6.5 or > 8.5**	**< 0.2**	**>0**		

Tap Water

D: Daily, M: Monthly, A:Annual

Date /time	Tap water #1 _____(name)				Tap water #2 _____(name)				Tap water #3 _____(name)				Correction action /comments	Completed by:
	Turbidity[D] (NTU)	pH[D]	Free Chlorine [D] (mg/L)	e. Coli[M] (mg/L)	Turbidity[D] (NTU)	pH[D]	Free Chlorine [D] (mg/L)	e. Coli[M] (mg/L)	Turbidity[D] (NTU)	pH[D]	Free Chlorine [D] (mg/L)	e. Coli[M] (mg/L)		
Critical limit	**> 5**	**< 6.5 or > 8.5**	**< 0.2**	**>0**	**> 5**	**< 6.5 or > 8.5**	**< 0.2**	**>0**	**> 5**	**< 6.5 or > 8.5**	**< 0.2**	**>0**		

Drinking-water containers

D: Daily, M: Monthly, A:Annual

Date /time	Drinking-water container #1 _____(name)				Drinking-water container #2 _____(name)				Drinking-water container #3 _____(name)				Correction action /comments	Completed by:
	Turbidity[D] (NTU)	pH[D]	Free Chlorine [D] (mg/L)	e. Coli[M] (mg/L)	Turbidity[D] (NTU)	pH[D]	Free Chlorine [D] (mg/L)	e. Coli[M] (mg/L)	Turbidity[D] (NTU)	pH[D]	Free Chlorine [D] (mg/L)	e. Coli[M] (mg/L)		
Critical limit	**> 5**	**< 6.5 or > 8.5**	**< 0.2**	**>0**	**> 5**	**< 6.5 or > 8.5**	**< 0.2**	**>0**	**> 5**	**< 6.5 or > 8.5**	**< 0.2**	**>0**		