EPA Region 8 Drinking Water Unit Finished Water Storage Tank Checklist

For either a Tank Inspection/Cleaning Report or an Unknown Integrity Significant Deficiency

Fill out one checklist per storage tank & submit labeled photos of each tank component with this form.

☐ **Inspection/Cleaning Checklist: Submit labeled photos of each cleaning/disinfection step.**

☐ **Unknown Integrity Checklist: Submit labeled photos of each tank component inspected.**

PWS Name:	PWS ID:		
Tank Name:	Tank ID:		
Proposed Cleaning/Inspection Date:	Actual Cleaning/Inspection Date:		
Name of Person Filling Out Form:	Title of Person Filling Out Form:		
I certify that this information is complete & accurate:		Date:	

Inspector Qualifications: *fill out regardless of which type of Checklist you are completing*
(answers to questions in this section should be "yes")

Name & contact information of inspector (if water system personnel) or inspection company:	
☐ Yes ☐ No	Has the inspector completed confined space training?
☐ Yes ☐ No	Did the inspector have a confined space entry permit?

I. Inspection/Cleaning Checklist

Cleaning & Disinfection Methods Used (See attached summary of AWWA C652 Disinfection Methods)

AWWA C652 states "*The record of compliance shall be the bacteriological test results certifying that the water held in the storage facility is free of coliform bacteria contamination.*"

Which cleaning method specified in AWWA C652 was used?

☐ Tank Drain & Clean (**attach System's Process report with Photos**)

☐ Divers (**attach Diver Report with Photos**)

If using a dive team, attach copies of all appropriate certifications.

Attach copies of all chlorine residual, turbidity & bacteriological analyses associated with this cleaning & inspection.

Which of the 3 basic disinfection methods of AWWA C652 was used (*see attached simplified AWWA C652 instructions*)?

☐ Method 1 ☐ Method 2 ☐ Method 3

Tank Cleaning Details

Describe any other items noted by the inspector that could cause finished drinking water contamination:

What repairs are suggested to prevent or eliminate the source of contamination?

Sediment depth in tank before cleaning (inches):

List objects found in the tank that may have introduced contamination into the system (e.g., debris, animals, etc):

If animal carcasses or other animal debris were found, was EPA notified immediately? ☐ Yes ☐ No
If not, why not?

Was the entry point for the carcass or debris eliminated? ☐ Yes ☐ No
Explain:

Attach tank as-built drawings or a sketch of the tank's configuration & dimensions including the location, layout & dimensions of all major components (i.e., access hatch, vent, overflow, drain)

Overall Tank Condition				
Significant Deficiency		**Required Correction**	**Proposed Completion Date**	**Actual Completion Date**
☐ Yes ☐ No	Are there issues with the tank foundation? Describe:	If "Yes", what repairs does tank inspector recommend?		
☐ Yes ☐ No	Does the tank appear structurally sound? If not, describe:	If "No", what repairs does the tank inspector recommend?		
☐ Yes ☐ No	Are there tank unprotected openings (breaches, leaks, daylight coming through tank in spots, etc).	If "Yes", explain type of breach & how it will be repaired.		
☐ Yes ☐ No	Is there corrosion developing in or on the tank?	If "Yes", explain where the corrosion is & how it will be repaired.		

II. Unknown Integrity Checklist

Unknown Integrity/Tank Inspection Checklist: Overflow				
Significant Deficiency		**Required Correction**	**Proposed Completion Date**	**Actual Completion Date**
☐ Yes ☐ No	Does the tank have an overflow separate from the vent?	If "No", explain deficiency & how it will be corrected:		
☐ Yes ☐ No	Does the tank overflow exit the tank below the tank vent?	If "No", explain deficiency & how it will be corrected:		
☐ Yes ☐ No	Is the overflow accessible for inspection?	If "No", explain deficiency & how it will be corrected:		
☐ Yes ☐ No	Is it equipped with #24-mesh non-corrodible screen OR is it a duckbill valve OR a sealed flapper valve with a screen inside (*EPA recommends #24-mesh*)?	If "No", explain deficiency & how it will be corrected:		
☐ Yes ☐ No	Using a duckbill or flapper? Give last inspection date. If using a flapper valve, what is the screen size	If not known, state when it will next be inspected.		
☐ Yes ☐ No ☐ NA ("NA" only applies if answering question below "Yes" or "No")	Does the overflow discharge 12-24 inches above an inlet structure, splash plate or riprap? What is the height?	If "No", modify overflow to provide for an appropriate discharge height & discharge material.		

☐ Yes ☐ No ☐ NA ("NA" only applies if answering question above "Yes" or "No")	Does the overflow have an air gap of 3 or more pipe diameters above any storm or sanitary sewer or drain entrance?	If "No", explain deficiency & how it will be corrected:		
☐ Yes ☐ No	Is the discharge dry? Is any water that exits the overflow able to flow rapidly & freely away to avoid ponding?	If "No", explain deficiency & how it will be corrected:		
☐ Yes ☐ No	Is there a blockage, a too-small overflow, a level control malfunction, or other issue that causes overflow through the hatch or vent, or continuous overflow? **Overflow structure capacity should at least equal maximum fill rate.**	If "Yes", explain what is causing the problem & how it will be repaired:		
☐ Yes ☐ No ☐ NA ("NA" only applies if tank is not in a properly constructed building)	If tank is in a properly constructed building, is the overflow designed such that an overflow event will not damage electrical or other vulnerable components in the building through splashing or flooding?	If "No", explain deficiency & how it will be corrected:		
☐ Yes ☐ No	Is the overflow discharge point visible?	If "No", EPA recommends moving it to a place where it is visible to allow inspection & emergency overflow event detection.		
☐ Yes ☐ No ☐ NA ("NA" only applies if tank is not in a properly constructed building)	If tank is in a properly constructed building, does the overflow discharge to an inside floor drain or through piping to outside?	If "No", explain deficiency & how it will be corrected:		

Unknown Integrity/Tank Inspection Checklist: Drain				
Significant Deficiency		**Required Correction**	**Proposed Completion Date**	**Actual Completion Date**
☐ Yes ☐ No	Is the drain accessible for inspection?	If "No", explain deficiency & how it will be corrected:		
☐ Yes ☐ No ☐ N A ("NA" only applies if answering question below "Yes" or "No")	Does the drain have an air gap of 3 or more pipe diameters above any storm or sanitary sewer or drain entrance?	If "No", explain deficiency & how it will be corrected:		
☐ Yes ☐ No ☐ NA ("NA" only applies if answering question above "Yes" or "No")	Does the drain discharge 12-24 inches above an inlet structure, splash plate or riprap? What is the discharge height & type of discharge material?	If "No", explain issue & how it will be corrected: RECOMMENDED, NOT REQUIRED.		
☐ Yes ☐ No	Is the discharge equipped with #24-mesh non-corrodible screen OR is it a duckbill valve OR a sealed flapper valve with a screen inside (*EPA recommends #24-mesh*)?	If "No", explain issue & how it will be corrected: RECOMMENDED, NOT REQUIRED.		
☐ Yes ☐ No	Is the discharge dry? Is any water that might exit the drain able to flow rapidly & freely away to avoid ponding?	If "No", explain issue & how it will be corrected: RECOMMENDED, NOT REQUIRED.		

Unknown Integrity/Tank Inspection Checklist: Air Vent				
Significant Deficiency		**Required Correction**	**Proposed Completion Date**	**Actual Completion Date**
☐ Yes ☐ No	Does the tank have a vent separate from the overflow?	If "No", explain how it will be corrected:		
☐ Yes ☐ No	Does the tank vent exit the tank above the overflow?	If "No", explain how it will be corrected:		
☐ Yes ☐ No	Is the vent covered with #24-mesh non-corrodible screen? Mesh Size:	If "No", explain deficiency & how it will be corrected:		
☐ Yes ☐ No ☐ NA ("NA" only if tank has a non-downturned vent)	**Downturned vent**: Is the vent ≥ 24" (*outdoor tank*) or 8" (*indoor tank*) above the nearest horizontal surface/roof?	If "No", reconfigure vent to provide proper air gap.		
☐ Yes ☐ No ☐ NA ("NA" only if tank has a downturned vent)	**Non-downturned vent** (***not allowed on buried tanks***): Does vent have a solid cover that terminates at its base?	If "No", explain deficiency & how it will be corrected:		
☐ Yes ☐ No ☐ NA ("NA" only if tank has a downturned vent)	**Non-downturned vent** (***not allowed on buried tanks***): Is screen ≥ 8" above the nearest horizontal surface/roof? What is the screen height?	If "No", explain deficiency & how it will be corrected:		

Unknown Integrity/Tank Inspection Checklist: Access Hatch				
Significant Deficiency		**Required Correction**	**Proposed Completion Date**	**Actual Completion Date**
☐ Yes ☐ No	Is hatch ≥ 4" above nearest horizontal surface/roof (***not required for above-ground indoor tanks***)? What is the height? _____	If "No", the hatch should be raised to the appropriate height above the nearest horizontal surface/roof.		
☐ Yes ☐ No	For **outdoor tanks**, is hatch ≥ 24" above natural ground surface (*sum of roof height above ground + at least 4" hatch height above nearest horizontal surface/roof*)? Height above nearest horizontal surface/roof?	If "No", raise the hatch to the appropriate height above the natural ground surface.		
☐ Yes ☐ No ☐ NA ("NA" only applies if answering the below question "Yes" or "No")	Does hatch have a shoebox lid with a 2" rim overlap (*not required if using another approved lid type*)?	If "No", install a properly designed lid & have it approved by EPA.		
☐ Yes ☐ No ☐ NA ("NA" only applies if answering the above question "Yes" or "No")	If lid is not shoebox-style, is it an approved watertight lid type with a neoprene rubber gasket? Describe lid type:	If "No", install a properly designed lid & have it approved by EPA.		
☐ Yes ☐ No	Is the hatch lid watertight & sealed with a neoprene rubber gasket?	If "No", investigate & repair the seal lack.		
☐ Yes ☐ No	Is the hatch locked, or in a secured area or locked building?	If "No", equip the hatch with a lock.		

AWWA C652 Tank Cleaning & Disinfection Simplified Instructions

All materials used shall comply with Safe Drinking Water & other federal regulation requirements for potable water systems. Water used for cleaning, solution preparation, & tank filling shall be potable water.

Scaffolding, planks, tools, rags, & other materials that are not part of the structural or operating facilities of the tank shall be removed. Then the surfaces of the walls, floor, & operating facilities of the storage facility shall be cleaned thoroughly using a high-pressure water jet, sweeping, scrubbing, or equally effective means. Any water, dirt, foreign material accumulated in this cleaning operation shall be discharged from the storage facility or otherwise removed.

The chlorine forms that may be used in disinfecting operations are liquid chlorine, sodium hypochlorite solution, or calcium hypochlorite granules or tables. Wear appropriate Personal Protective Equipment when using these products.

Tank Drain & Clean

AWWA C652 Disinfection – Returning a Tank to Service (Method 1, 2, or 3 is fine)

3 chlorination methods are explained herein. Typically, only 1 method is used, but a combination method is allowable.

Method 1: Chlorination of the full storage facility such that, at the end of the retention period, the water will have a free chlorine residual of ≥ 10 mg/L.

1. Add liquid sodium hypochlorite to the influent pipe while filling, or
2. Place calcium hypochlorite tablets on the tank bottom before filling.
3. Target chlorine residual > 10 mg/L after the retention period:
    a. 6 hours required for (1)
    b. 12 hours required for (2)
4. Drain the high chlorine residual water or blend it with distribution system water.
    a. Must be certain to meet local discharge requirements.
5. Conduct bacteriological testing.
6. If it passes & water is acceptable aesthetic quality, it may be delivered to the distribution system.

Method 2: Spray or paint all storage facility water-contact surfaces with a solution of 200 mg/L available chlorine.

1. Spray solution of 200 mg/L available chlorine onto all surfaces that would be in contact with water
2. Contact time at least 30 minutes
3. Fill any drainpipes with a chlorine solution of 10 mg/L.
4. Fill the storage facility with potable water.
5. Conduct bacteriological testing
6. If it passes & water is acceptable aesthetic quality, it may be delivered to the distribution system.

Method 3: A 2-step chlorination process of the bottom of the storage facility with 50 mg/L available chlorine followed by filling to overflow & maintaining a free chlorine residual of at least 2 mg/L for 24 hours.

1. Add chlorine & water to the storage facility.
    a. Target initial chlorine dose of 50 mg/L
    b. Fill approximately 5% of total storage volume
2. Hold for at least 6 hours
3. Fill to overflow level & hold for at least 24 hours.
4. Purge highly concentrated water from the drainpipes.
5. Conduct bacteriological testing
6. If it passes & water is acceptable aesthetic quality & chlorine residual is > 2 mg/L, it may be delivered to the distribution system.

Diver Clean & Inspect

Hold a pre-job meeting with the contractor & facility representatives to ensure clarity on:

- Tank configuration
- Disinfection procedures
- Underwater appurtenances that might be encountered during the dive
- Time restrictions
- Diving conditions
- Safety procedures
- Inspection & cleaning requirements and report generation

Personnel Requirements

Diving clothing must be of the dry-suit type with no imperfections that impair its integrity. Air can be externally supplied or SCUBA. The diver's head must be fully encapsulated with no bare skin exposed.

All personnel on the dive team must be properly trained, including OSHA Confined Space Certification & Red Cross CPR & First Aid certification. Divers must have formal certification of proper training & experience. All certificates should be verified by facility representatives.

All members of the dive team must be healthy & free of any communicable diseases or other health impairments for at least 7 days prior to the dive.

The contractor must have a comprehensive safety manual onsite.

Tank Disinfection Pre-Dive

The tank should be isolated from the water system. Facility representatives must establish the tank water chlorine residual (if storing treated water) & turbidity prior to entry by taking samples from several depths & locations.

Dirt & other material on the tank roof & hatch area can contaminate equipment. Prior to opening the access hatch, the hatch & immediate area must be cleaned of all loose dirt & debris.

All equipment & personnel that will enter the storge tank must be disinfected immediately prior to entry. Any equipment that contacts the tank roof must be disinfected again prior to entry into the water. Disinfection shall be by submersion in, spraying with, or sponging with disinfectant solution with at least 200 mg/L available chlorine.

Tank Disinfection Post-Dive

Samples should be collected for chlorine residual & turbidity during the dive. Satisfactory bacteriological & chlorine residual results are required before the tank can be placed back into service.