MODULE 5

MONITOR CONTROL MEASURES AND VERIFY PERFORMANCE

SANITATION
SAFETY
PLANNING

SSP Manual
Pages
77 to 84

World Health Organization

SSP Modules

Page 77 of your SSP manual

Is the system operating as intended?

MODULE 5

Overview

STEPS

5.1 Define and implement operational monitoring.

5.2 Verify system performance.

5.3 Audit the system.

OUTPUTS

- An operational monitoring plan.
- A verification monitoring plan.

STEP 5.1

Define and implement operational monitoring

OBJECTIVE

To give simple and rapid feedback on system performance, so that corrections can be made quickly, if required.

Operational Monitoring

Routine monitoring to inform management decisions.

- Frequent.
- Many monitoring points throughout the system.
- Simple observations and tests.
- Used to manage risks before they occur.
- Implemented by service provides

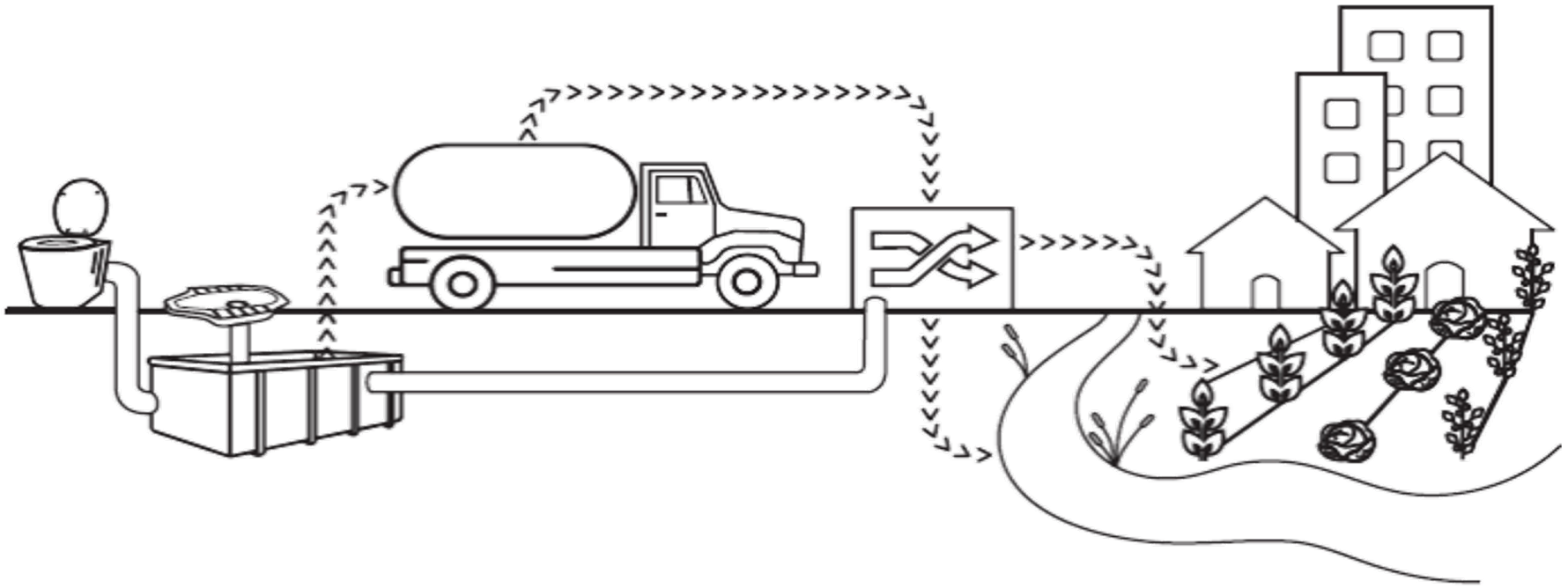
SSP Manual Page 83

STEP 5.1

Define and implement operational monitoring

Operational monitoring collects and uses

- Simple observations and measurements
- Sampling and testing



STEP 5.1

Define and implement operational monitoring

SSP Manual Guidance note 5.1, Page 79

WHO Guidelines Section 4.6.2 Page 70

Possible monitoring parameters for each sanitation step:

Toilet

- Availability, accessibility and privacy of toilet facilities.
- Cleanliness.

Inspection of dwellings and buildings

Routinely, in periodic/ special surveys or in the national census

Containment-storage/treatment

- State of cover slab.
- Visible/reported overflows.

Inspection of dwellings and buildings

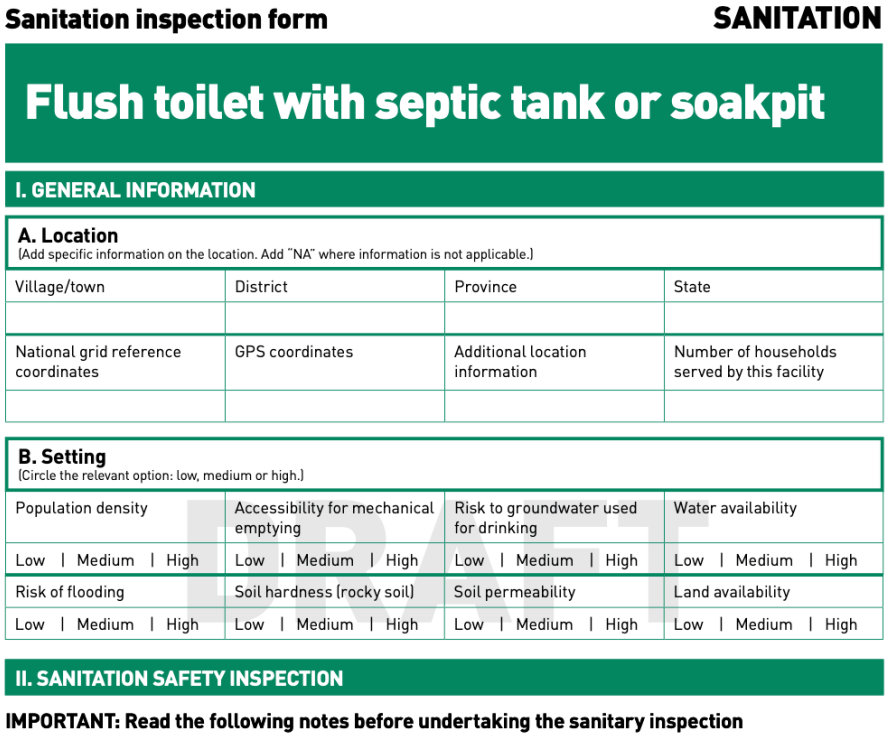
Routinely, in periodic/ special surveys or in the national census

STEP 5.1

Define and implement operational monitoring

WHO Sanitary Inspection Forms

Short-standardized observation checklists that can be adapted and used by stakeholders to assess risk factors at or near sanitation facilities.



Sanitation inspection form **SANITATION**

Flush toilet with septic tank or soakpit

I. GENERAL INFORMATION

A. Location
(Add specific information on the location. Add "NA" where information is not applicable.)

Village/town	District	Province	State
National grid reference coordinates	GPS coordinates	Additional location information	Number of households served by this facility

B. Setting
(Circle the relevant option: low, medium or high.)

Population density	Accessibility for mechanical emptying	Risk to groundwater used for drinking	Water availability
Low | Medium | High	Low | Medium | High	Low | Medium | High	Low | Medium | High
Risk of flooding	Soil hardness (rocky soil)	Soil permeability	Land availability
Low | Medium | High	Low | Medium | High	Low | Medium | High	Low | Medium | High

II. SANITATION SAFETY INSPECTION

IMPORTANT: Read the following notes before undertaking the sanitary inspection

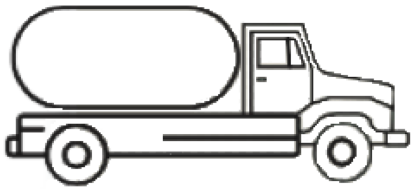
STEP 5.1

Define and implement operational monitoring

SSP Manual Guidance note 5.1, Page 79

WHO Guidelines Section 4.6.2 Page 70

Possible monitoring parameters for each sanitation step:

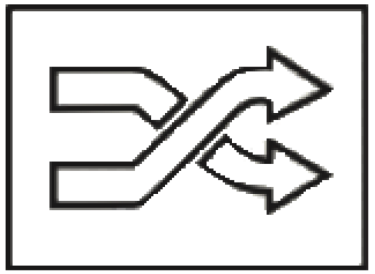


Transport and conveyance

- Use of PPE by sanitation workers
- Use of the pre-defined roads
- Cleanliness of sewers

Data collected from customers, formal and informal operators and, where relevant, licensing authorities or regulatory bodies.

Treatment



- Flow rate
- Retention times
- Composting temperatures

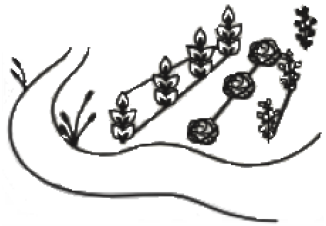
Data collected from operators and verified by occasional sampling and independent laboratory analysis.

STEP 5.1

Define and implement operational monitoring

SSP Manual Guidance note 5.3, Page 82

Possible monitoring parameters for each sanitation step:



End use/ disposal

- Correct application / irrigation process.
- Duration of withholding periods.

Inspection of nearby farms

Routinely, in periodic surveys

TIPS

Keep in mind…

May not be practical to monitor all control measures.

Decide which control measures need to have operational monitoring (prioritize based on risk assessment).

Critical limits help decide acceptability:

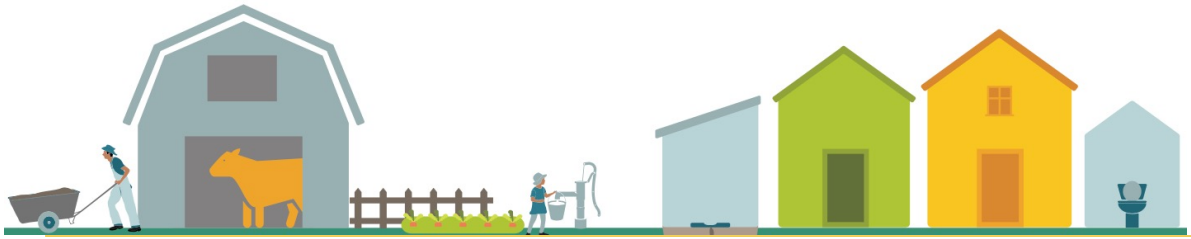
- usually **numerical limits** based on a parameter measurement.
- **qualitative limits** may be appropriate (e.g. “all odours to be acceptable” or “flies not a nuisance”).

Suggested recording format

TOOL 5.2. Template for operational monitoring

OPERATIONAL MONITORING PLAN				
Operational monitoring plan for: (Give control measure short description)				
Operational limits[a]	**Operational monitoring of the control measure**		**Corrective action when the operational limit is exceeded**	
	What is monitored?		What action is to be taken?	
	How is it monitored?			
	Where is it monitored?		Who takes the action?	
	Who monitors it?		When is it taken?	
	When is it monitored?		Who needs to be informed of the action?	

[a] If the monitoring is outside this limit(s), the control measure is deemed to be not functioning as intended.



Worked example: SSP IN NEWTOWN

Operational monitoring plan for: Training of vacuum truck operators about health and safety				
Operational limits	**Operational monitoring of the control measure**		**Corrective action when the operational limit is exceeded**	
100% (Workers are required to use personal protective equipment [PPE] at all times)	**What is monitored?**	Frequency of PPE use by workers	**What action is to be taken?**	Policy involves a fee to be paid to City Service "Traffic law enforcement and licences".
	How is it monitored?	Surprise visits to the field and observation		
	Where is it monitored?	At the household and roads	**Who takes the action?**	Traffic policy officer
	Who monitors it?	Traffic policy officer	**When is it taken?**	Every time
	When is it monitored?	Constantly	**Who needs to be informed of the action?**	Regional Health Department

STEP 5.2

Verify system performance

OBJECTIVE

To periodically verify whether the system meets the intended performance outcomes.

Verification

It checks the effectiveness of the implemented control measures.

- Periodic.
- Few points but focused on the system-end points (quality of the effluents).
- More complicated tests (e.g. E.coli, Helminth eggs).
- Used to prove the system works.
- Might be undertaken by the operator or surveillance agencies.

STEP 5.2

Verify system performance

Examples of **typical verification data**

SSP Manual Guidance note 5.2, Page 82

Toilet

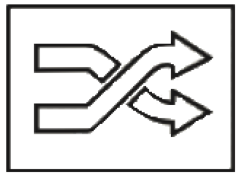
- Use of toilet facilities (decrease of open defecation)

Containment-storage/treatment

- Pathogen concentration in groundwater

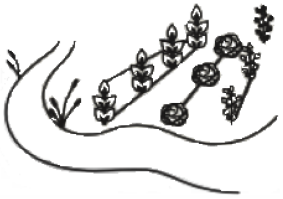
Conveyance

- Amount of faecal sludge transported to the faecal treatment system.



Treatment

- Microbial testing of effluents, e.g. E.coli and Helminth eggs.



End use/ disposal

- Microbial testing of crops, fish products, and waters at exposure points and system boundaries, e.g. E.coli and Helminth eggs.

Operational vs. Verification Monitoring
Let's see some examples:

Hazardous event: Ingestion of pathogens while using dirty shared toilets because of lack of cleaning and maintenance.

Control measure: Outsourcing a private business to clean and maintain the shared facilities.

Monitoring parameter: Daily cleaning of the facilities, using an attendance sheet signed by the janitor.

Verification parameter: Cleanliness of the toilet, using sanitary inspections.

Operational vs. Verification Monitoring
Let's see some examples:

Hazardous event: Ingestion after contact with faecal sludge discharged without treatment to the open.

Control measure: Licensing private operators and training them to bring the faecal sludge to a legal discharging point.

Photo by C. S. Sharada Prasad

Monitoring parameter: Number of licensed and trained operators.

Photo by SNV

Verification parameter: Number of operators bringing the sludge to the legal discharging point.

Photo by López Vázquez et al.

Operational vs. Verification Monitoring

Let's see some examples:

Hazardous event: Consumption of contaminated agricultural products grown with faecal sludge

Control measure: Co-composting of de-watered faecal sludge with organic solid waste

Photo by S. Kramer

Monitoring parameter:
Temperature reached in co-composting piles

Verification parameter:
Parasitic helminth eggs (HELarval/gTS)
Pathogen indicator of faecal
Coliforms (MPN/g TS)

Photos by S. Kramer

STEP 5.3

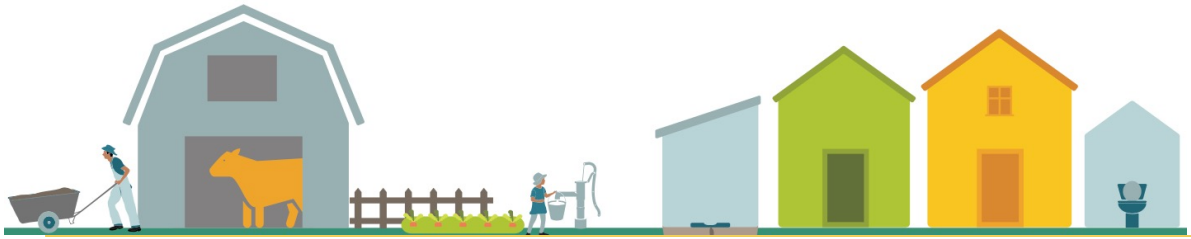
Audit the system

OBJECTIVE

To provide additional independent evidence of the system performance and quality of the SSP.

Audits:

- Might not be feasible in the initial stages of SSP implementation.
- Check the quality and effectiveness of the SSP implementation.
- Ensure that the SSP contribute to health outcomes.
- Can be done by internal, regulatory or independent auditors.
- Demonstrate that the sanitation safety plan has been properly designed, is being implemented correctly and is effective.



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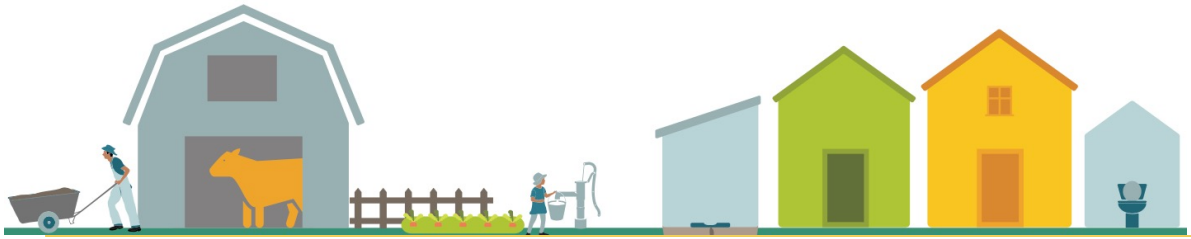

Worked example: SSP IN NEWTOWN

Sanitation step	Verification				
	What	Limit	When	Who	Method
P2: Disposal of liquid fraction by infiltration	*E. coli* testing in drinking-water	No detectible *E. coli*/100 mL	Annual	Epidemiologist, Sanitola School of Public Health	Sampling and testing
P4: Disposal of faecal sludge in open drains	Amount of faecal sludge transported to the WWTP	>50 m3/day	Every week	WWTP Operations Manager	Survey
T2: Open drains	Number of new connections to the sewer system	>500/year	Annual	Head, Commercial Unit, NSD	Annual reports
T2: Open drains	Number of overflows per year	<3 overflows	Annual	Engineering Section, NSD	Annual reports
P6: Use of wastewater in agriculture	Farmer health status: % of farmers and family member with helminth infections	<10%	Annual	Regional Health Department	Annual survey
P6: Use of wastewater in agriculture	Microbial concentration of pathogens at harvest	No worm eggs or *E. coli*/gram in vegetables	Annual	Epidemiologist, Sanitola School of Public Health	Sampling and testing

GROUP WORK

Applying Module 5 to your SSP

Within your groups:

- For the 3 selected control measures, prepare the operational monitoring plan.
- For the 3 selected control measure, prepare the verification plan.

Tool: Sanitation Safety Plan

Moratuwa Ratmalana (Sri Lanka)

developed by participants of the SSP Training

MODULE 5: Monitor control measures and verify performance

STEP 5.1: Define and implement operational monitoring

For each prioritized hazardous event and their improvement measures, choose 1 improvement measure that should have an operational monitoring plan.

Prioritized hazardous event	Sanitation step	Choose one control measure that will have a detailed operational monitoring plan

Using the following tables, prepare the operational monitoring plan for the chosen control measures:

Operational monitoring plan for:	Operational monitoring plan			
Operational limits	**Operational monitoring of the control measure: Control measure:**		**Corrective action when the operational limit is exceeded**	
	What is monitored?		**What action is to be taken?**	
	How is it monitored?			
	Where is it monitored?		**Who takes the action?**	
	Who monitors it?		**When is it taken?**	
	When is it monitored?		**Who needs to be informed of the action?**	

MODULE 5

MONITOR CONTROL MEASURES AND VERIFY PERFORMANCE

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