# 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

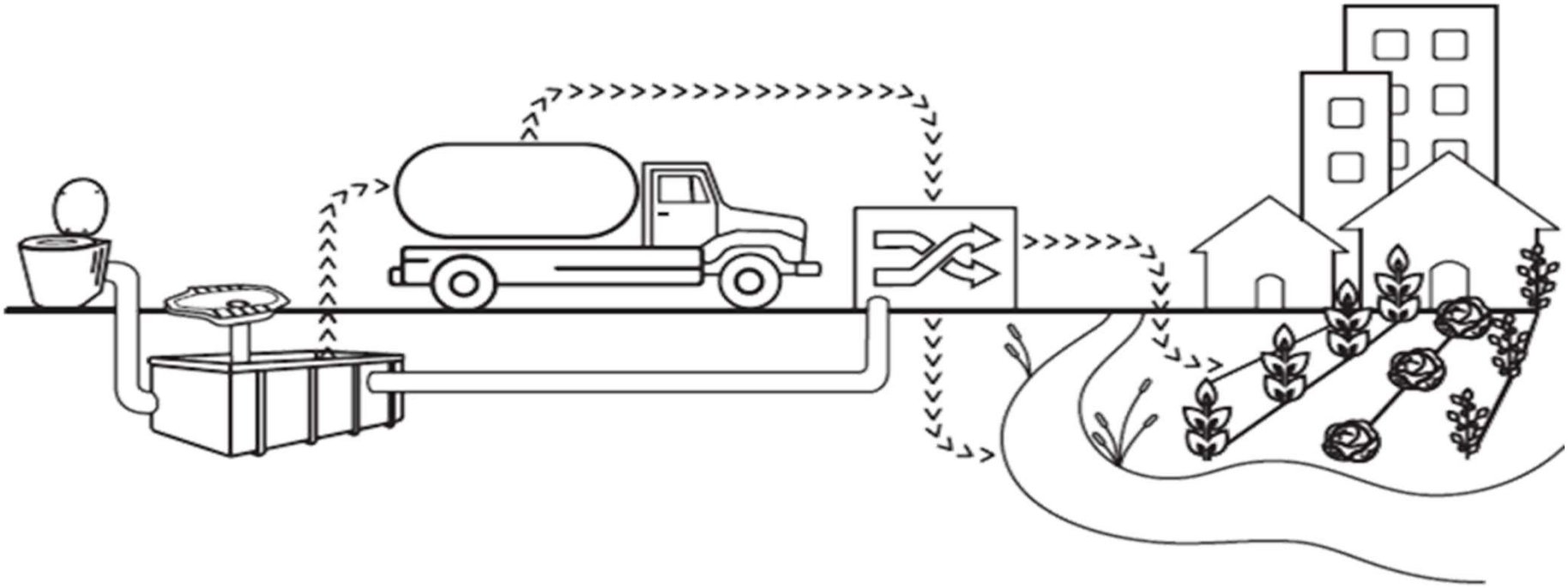
SSP Manual Page 83

# 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

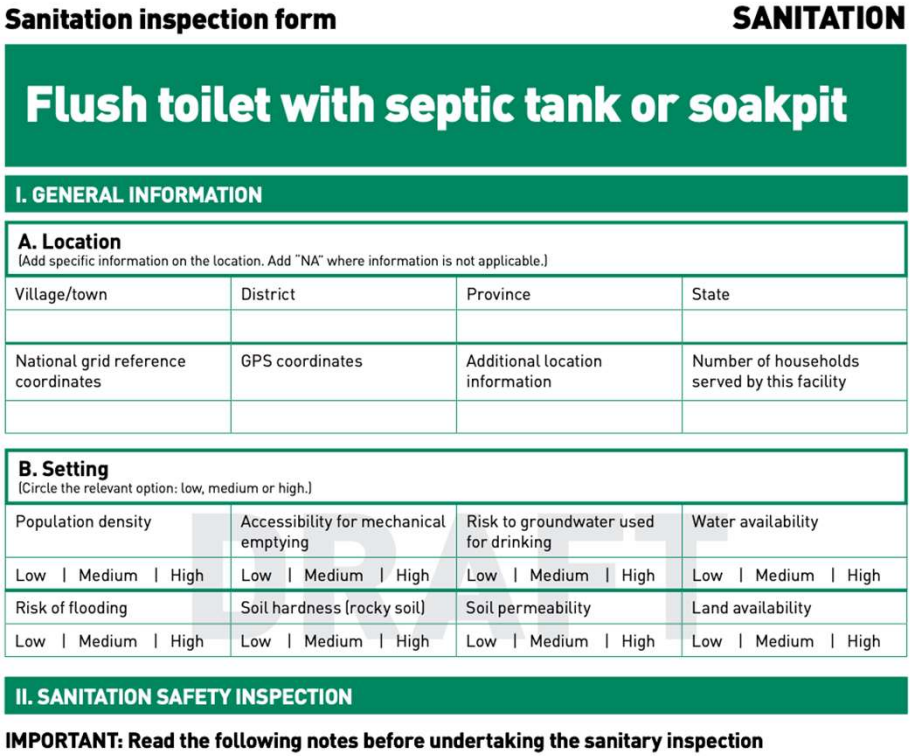
Routinely, in periodic/ special surveys or in the national census

# 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

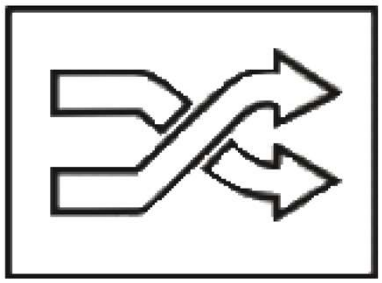
## Possible monitoring parameters for each sanitation step:

### 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

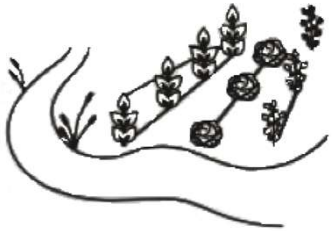
Data collected from operators and verified by occasional sampling and independent laboratory analysis.

# 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”).

# STEP 5.1

Define and implement operational monitoring

## 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%<br>(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 |

## 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**

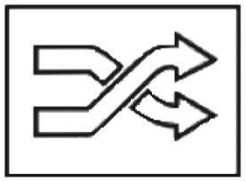
- Use of toilet facilities (decrease of open defecation)

**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

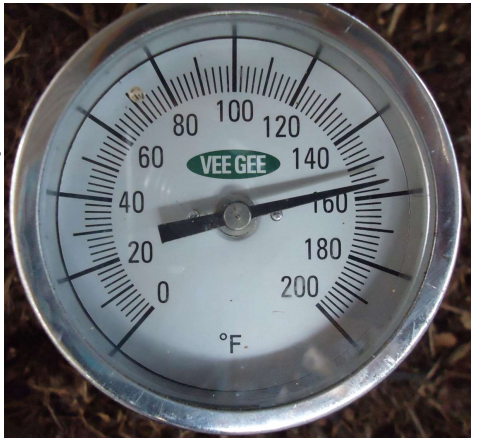
## Let's see some examples:

**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



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# 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.

# Worked example: SSP IN NEWTOWN

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|---|---|---|---|---|
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# Worked example: SSP IN NEWTOWN

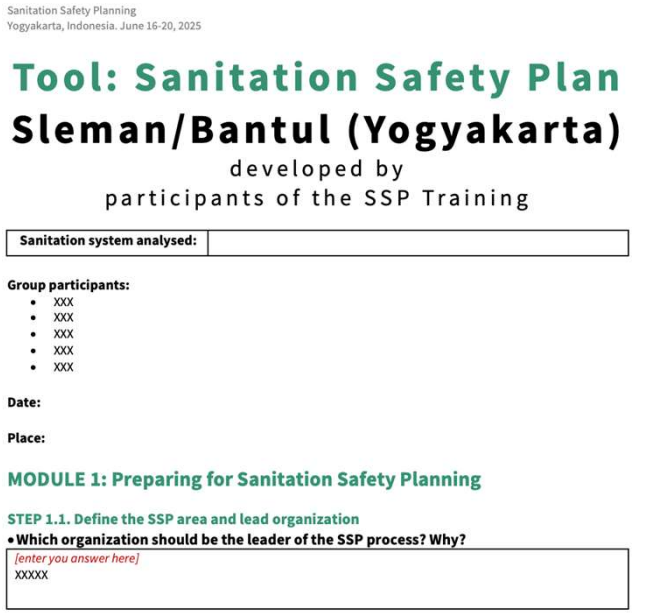
| Sanitation step | Verification | | | | |
|---|---|---|---|---|---|
| | What | Limit | When | Who | Method |
| P2: Disposal of liquid fraction by infiltration | *E. coli* testing in drinking-water | No detectible *E. coli*/100 mL | Annual | Epidemiologist, Sanitola School of Public Health | Sampling 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.



Sanitation Safety Planning
Yogyakarta, Indonesia. June 16-20, 2025

**Tool: Sanitation Safety Plan**

**Sleman/Bantul (Yogyakarta)**

developed by
participants of the SSP Training

| Sanitation system analysed: | |
|---|---|

**Group participants:**

- XXX
- XXX
- XXX
- XXX
- XXX

**Date:**

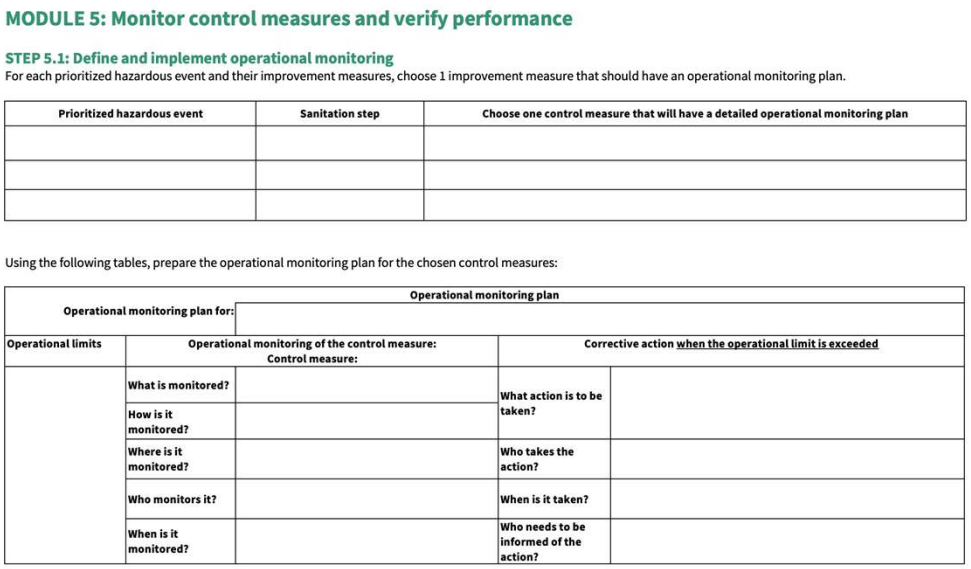
**Place:**

**MODULE 1: Preparing for Sanitation Safety Planning**

**STEP 1.1. Define the SSP area and lead organization**

- **Which organization should be the leader of the SSP process? Why?**

*[enter you answer here]*
XXXXX



**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?** | |
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# MODULE 5

# MONITOR CONTROL MEASURES AND VERIFY PERFORMANCE

SANITATION
SAFETY
PLANNING



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