

**Comprehensive Water Quality
Management Systems:
Potential Scope of a Complete
System**

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Sanitary Surveys
Hazard Analysis Critical
Control Points
Water Safety Plans
Vulnerability Assessments
(ISO-EMS)

SANITARY SURVEY

(EPA Guidance Manual 1999)

**Every 3-5 years for Community Water
Systems-Surface Supplies and Ground Water
Supplies Under Direct Influence
IESWTR**

**Is the System's Source, Facilities, Equipment,
Operation, Maintenance effective in producing
Safe Water?**

**Evaluate System's Compliance with Fed. and
State DW Regs.**

**Evaluate Water Quality Data and Admin. Issues
and Assess System's Integrity and Reliability**

COVERAGE:

**Source – Protection, Physical Elements and
Condition, Vulnerabilities**

**Treatment – Appropriateness, Adequate
Performance**

**Distribution – Condition, Integrity
Finished Water Storage**

Pumps, Pump Facilities and Controls

Monitoring / Reporting / Data Verification

System Management / Operations

Operator Compliance with State Requirements

BENEFITS:

Operator Education

Source Protection

Risk Evaluation

Technical Assistance/Training

Independent Third Party Review

Info. For Monitoring Reduction / Waiver Programs

Limits to Ability to Provide Safe Water

Informal Resolution vs Enforcement Actions

Reduced Oversight Need

Communication between State and WS personnel

Contacts for Emergencies and Tech. Assistance

Improved Reg. Compliance
ID Candidates for Enforcement
Candidates for Comprehensive Performance
Evaluations
Data Validation
Test Equipment and Procedures Validation
Reduced Waterborne Disease Risk
Encourage Disaster Response Planning
Improved System Security

HACCP

Management Plan

**Systematic Approach to Managing Risk of
Injury**

**Commonly applied in Food Production
Analogy to Water Production**

HACCP Principles

Hazard Analysis - System Elements likely sources of harm, contamination

Determine Critical Control Points – Key elements where control anticipate, prevent, mitigate risks

Set Critical Limits – Practices, standards etc.

Monitoring Procedures – Inputs, facilities, unit processes, water quality

Corrective Actions – Prevention & mitigation to manage CCPs & correct deficiencies

Record Keeping – Which, Where to store, For how long?

Verify System's Performance – Periodic audits of system & plan, performance relative to plan

Update/revise the plan

WATER SAFETY PLANS

WHO--2004

- Guidelines for DW Quality
 - Comprehensive Risk Assessment/Management

Minimum Content:

- System Assessment
- Effective Monitoring/Control Meas.
- Management Plans

Objectives:

- Protect Water Sources
- Treatment to Control
- Prevent Post Contamination

- Understand the System
- ID Sources of Contamination
- Validate Control Measures
- Monitor Control Measures
 - Corrective Actions
 - Verify DW Quality

VULNERABILITY ASSESSMENTS

**Malevolent Threat Orientation
Required for Water Utilities**

EPA Requirements

**System Characterization including mission
and objectives**

**Identify and Prioritize adverse
consequences**

Determine Critical Assets at Risk

**Assess Qualitative Probability of
Malevolent Acts**

Evaluate Existing Countermeasures

Prioritized Plan for Risk Reduction

PLAIN ENGLISH VERSION

Planning

Threat Assessment

Site Characterization

Consequence Assessment

System Effectiveness

Risk Management

Some Common Features

Risk Avoidance & Recovery
Comprehensive Assessment (A to Z)
Critical Limits/Targets
Monitoring
Plans
Record Keeping
Verification/Audit
Update/Improvement

Slightly Different Overlapping Emphases

SS---Regulatory/Sanitation/Deficiencies

WSP—Quality and Safety

HACCP---Quality and Safety

VA---Regulatory/Deliberate Acts

So--

**Why not consolidate into a
single risk assessment and
management system that covers
all of them?**