

WATER AND WASTEWATER MONITORING

Resources for a Monitoring Programme

by

Risky Ayu Kristanti

Faculty of Engineering Technology
kristanti@ump.edu.my



Resources for Monitoring Programme

By Risky Ayu Kristanti

<http://ocw.ump.edu.my/course/view.php?id=635#section-10>

Chapter Description

- Aims
 - Student review the laboratory facility, transport, staffing and human resource development and training
 - Student explains how the needs of communication during monitoring
 - Student decide the inventory sampling stations and schedules for sampling expeditions
- Expected Outcomes
 - Student should be able to review the laboratory facility, transport, staffing and human resource development and training
 - Student should be able to explains how the needs of communication during monitoring
 - Student should be able to decide the inventory sampling stations and schedules for sampling expeditions
- Other related Information
 - Environmental Protection Agency
 - Natural Resources Conservation Service
- References
 - Burden, Foerstner, McKelvie, and Guenther (2002) **Environmental Monitoring Handbook**, The McGraw-Hill Companies, Inc.
 - Jamie Bartram and Richard Balance. 1996. **Water Quality Monitoring: A Practical Guide to Design and Implementation of Freshwater Quality Studies and Monitoring Programmes**, CRC Press.



Resources for Monitoring Programme

By Risky Ayu Kristanti

<http://ocw.ump.edu.my/course/view.php?id=635#section-10>

Communitising Technology

LABORATORY FACILITY

- In situ : field kits or mobile laboratory
- Ex situ : UV-VIS spectrophotometer, High Performance Liquid Chromatography (HPLC), Atomic Absorption Spectroscopy (AAS)



Resources for Monitoring Programme

By Risky Ayu Kristanti

<http://ocw.ump.edu.my/course/view.php?id=635#section-10>

TRANSPORT

- Off-road vehicle (remote or rural area)
- Boat (large lakes and rivers)
- Bus or train (reliable public transport)



STAFFING

Staff on a water quality monitoring program:

- Program manager
- Field staff
- Laboratory staff
- Data processor

The number required depend on size and scope of the monitoring program



PROGRAM MANAGER

- Planning of water quality monitoring activities
- Coordination with regional centers, collaborating agencies, participating laboratories and others
- Procurement of necessary equipment and consumable supplies
- Arranging suitable transport
- Recruitment of staff
- Training of staff
- Preparation of training manuals



PROGRAM MANAGER (CONT.)

- Safety in the field and in the laboratory
- Preparation of standard operating procedures
- Organizing and managing central office facilities for the storage, handling, interpretation and distribution of data
- Supervising and evaluating the performance of all staff
- Reviewing and evaluating procedures
- Preparation of reports and dissemination of the findings of the monitoring programme.



FIELD STAFF

- Field staffs are required for field work and sampling.
- Responsible on:
 - ✓ Undertaking sampling expeditions
 - ✓ Obtaining samples according to SOPs
 - ✓ Labelling sample bottles, making notes and recording unusual conditions at the sampling station
 - ✓ Preparing samples for transport and delivering to the laboratory
 - ✓ Routine maintenance of equipment
 - ✓ Preparing sample bottle
 - ✓ Performing field test for selected



LABORATORY STAFF

- Undertake chemical, microbiological and biological analyses
- Responsible on :
 - ✓ Laboratory management
 - ✓ Determining and procuring the equipment and supplies that will be needed
 - ✓ Ensuring the SOPs are being followed
 - ✓ Quality control of analytical procedures
 - ✓ Enforcing safety precautions and procedures, for fire, explosions and noxious fumes



QUALITY ASSURANCE OFFICER

Responsible on :

- Reporting directly to senior manager on matters concerning quality assurance
- Monitoring the quality of analytical work in the laboratory and in the field
- Auditing the reports, laboratory notebooks, field notebooks and other lab documentation



Resources for Monitoring Programme

By Risky Ayu Kristanti

<http://ocw.ump.edu.my/course/view.php?id=635#section-10>

HUMAN RESOURCE DEVELOPMENT

- Quality of data produced ~ adequately trained staff
- Training is a continuing process, e.g. short courses, seminars and workshops
- Training should be flexible, taking account to specific needs of individual staff members and encouraging staff to join appropriate professional organizations



COMMUNICATION

- Good for achieving programme outputs, ensure the aims are met and ensure the continued work.
- Communication internal (analyst to lab chief and analyst) or external (External Support Agencies, e.g., GEMS/WATER programme)



INVENTORY OF SAMPLING STATION

- A map of the general area showing the location of sampling station
- A narrative description of how to get the sampling station
- A full description of the sampling station
- Notes concerning means of access and whether permission
- Notes of any times of year when access may be difficult/ impossible
- Boat rental arrangement
- Special equipment (e.g. ropes, lifebelts) and clothing (e.g. waters)
- Time or times of day when samples are to be obtained
- Test that are to be made on site
- Volume of sample required and any preservatives treatment
- Travel time for the sampling station to the nearest laboratory



SCHEDULES FOR SAMPLING EXPEDITIONS

- Depends on:
 - ✓ Local conditions,
 - ✓ Travel time
 - ✓ Seasonal weather and travel problem
 - ✓ Qualifications of the field staff
 - ✓ Availability of transport
 - ✓ The maximum time permitted between collection and analysis of samples



Conclusion of The Chapter

- Resource for monitoring program should be checked before conducting. It includes laboratory facility, transport, staff and human resource development and training.



Resources for Monitoring Programme

By Risky Ayu Kristanti

<http://ocw.ump.edu.my/course/view.php?id=635#section-10>

Reference

Jamie Bartram and Richard Balance. 1996. **Water Quality Monitoring: A Practical Guide to Design and Implementation of Freshwater Quality Studies and Monitoring Programmes**, CRC Press.



Resources for Monitoring Programme

By Risky Ayu Kristanti

<http://ocw.ump.edu.my/course/view.php?id=635#section-10>