

**A STRATEGY FOR MONITORING AND  
ASSESSMENT TO SUPPORT WATER  
RESOURCES MANAGEMENT**

**Appendix 7**

**Preliminary List of Detailed Data and Information Requirements for Water  
Resources Management**

Compiled by J Moolman, IWQS 21 Feb 2000

# PRELIMINARY LIST OF DETAILED DATA AND INFORMATION REQUIREMENTS FOR WATER RESOURCES MANAGEMENT

- |   |  |
|---|--|
| <p>1. Boundaries/Cadastral</p> <ul style="list-style-type: none"> <li>- international</li> <li>- provincial</li> <li>- magisterial districts</li> <li>- local authorities</li> <li>- district council</li> <li>- TLC's</li> <li>- catchment/drainage areas</li> <li>- catchment management areas</li> <li>- farms + portions (including last 100 years)</li> <li>- building registration districts</li> <li>- registration districts</li> <li>- Government Water Control Areas</li> <li>- Water Board Control Areas</li> <li>- irrigation districts</li> <li>- surveyor general survey diagrams</li> <li>- DWAF project areas</li> <li>- 1:50 000 map sheet boundaries</li> <li>- 1:250 000 map sheet boundaries</li> <li>- 1:500 000 map sheet boundaries</li> </ul> | <ul style="list-style-type: none"> <li>- community income</li> <li>- levels of water and sanitation services</li> </ul>  |
| <p>2. Climate</p> <ul style="list-style-type: none"> <li>- rainfall</li> <li>- rainfall stations</li> <li>- evaporation</li> <li>- temperature</li> <li>- wind</li> <li>- climate zones of South Africa</li> </ul>  | <p>4. Ecological</p> <ul style="list-style-type: none"> <li>- species distribution</li> <li>- animal habitat</li> <li>- existing macro-invertebrate monitoring sites</li> <li>- macro-invertebrate data (SASS)</li> <li>- fish</li> <li>- exotic species - flora and fauna</li> <li>- riparian vegetation</li> <li>- ecoregions</li> <li>- bioregions</li> <li>- Aquatic weeds</li> <li>- Species diversity</li> </ul>   |
| <p>3. Demography</p> <ul style="list-style-type: none"> <li>- census</li> <li>- population projections/growth</li> <li>- population distribution/density</li> <li>- poverty indexes</li> <li>- economic information</li> <li>- population by income levels</li> <li>- rural/urban/peri-urban</li> </ul>   | <p>5. Geology + Geohydrology</p> <ul style="list-style-type: none"> <li>- lithology</li> <li>- structure</li> <li>- stratigraphy</li> <li>- geophysical</li> <li>- geochemical</li> <li>- palaeontology</li> <li>- aquifers                         <ul style="list-style-type: none"> <li>- types</li> <li>- thickness</li> <li>- recharge</li> <li>- potential</li> <li>- vulnerability</li> </ul> </li> <li>- mineral occurrences</li> <li>- construction material occurrences</li> <li>- mineral rights ownership</li> </ul> |
|   | <p>6. Geomorphology</p> <ul style="list-style-type: none"> <li>- longitudinal geomorphological river zones</li> <li>- channel condition</li> </ul>   |

- channel morphology
7. Hydrology
- median annual simulated runoff
  - measurements of daily flow
  - coefficient of variation of annual simulated runoff
  - simulated MAR per quaternary drainage region
  - simulated monthly flow volumes per quaternary catchment
  - levels of assurance of defined flows
  - coefficients of variation - annual, seasonal monthly, daily
  - index of baseflow contribution
  - hydrologic zones
  - water status map
  - flood lines
  - flood peaks
  - flood history
  - irrigation potential
  - flow data
    - volumes
    - dam levels
    - transfer schemes
  - groundwater
    - static water level contour map
    - borehole yields
  - stream order
  - river source distance
8. Infrastructure
- roads
  - bridges
  - railways
  - towns + cities
  - settlements
  - powerlines
  - existing telemetry corridors
  - telephone lines
  - existing servitudes
- emergency services
  - UHF + HF radio network
  - refuse/waste disposal sites
  - location of clinics + creches
  - factories
  - aspect
9. Land Cover + Land Use
- satellite imagery
  - aerial photographs
  - orthophotos
  - land use
    - present
    - potential
  - dense bush
  - plain bush
  - alien vegetation
  - forest
    - indigenous
      - composition type
      - age class
    - commercial
      - age class
      - species type
    - secondary processing
      - prices
      - production volumes
      - non-timber forest types
      - communities around forests
      - community forestry projects
      - urban forestry (streets + parks)
  - provincial
  - national
  - woodlots
  - cultivated areas
  - conservation areas
  - agriculture
  - industrial

- mines
  - underground workings
  - mine dumps + slimes dams
- rural settlements
- vegetation
  - Low + Rebello
  - Acocks
  - Rutherford + Westfall
- veld type distribution
- bare surface
- grasslands
- grave sites

#### 10. Legal/Administrative

- deeds
- land ownership
- mineral rights ownership
- water rights
- water allocation permits

#### 11. Pedology

- soil maps
- soil profiles
- soil texture

#### 12. Topography

- elevation
- DTM
- contour maps
- trig beacons
- slopes
- physiographic regions
- terrain morphology
- altitude zones
- channel slope
- catchment relief

#### 13. Water Infrastructure

- rivers
- abstraction points
- discharge points
- monitoring points

- flow gauging stations
  - type of measuring structure
  - upstream catchment area
  - start date
- boreholes
- water care works
- dams
  - locations
  - drawings
  - foundation
  - capacity
  - surface area volume relationship
  - date built
  - design parameters
  - recreation zoning
  - bathymetry
  - sediment surveys
- canals
- pipelines
- pump locations
- springs
- pans
- existing + proposed DWAF schemes
- weirs
- flood control
- voice + telemetry schemes
- municipal water schemes
- service coverage

#### 14. Water Quality

- pollution distribution
- water chemistry regions
- monitoring programme information
- DWAF Water Quality Guidelines
- chemical data
  - major inorganic constituents
  - minor inorganic constituents
  - organics
  - nutrients
- microbiological data
- physical data
  - temperature

- oxygen
- turbidity
- suspended solids
- radioactivity
- toxics
- erosion and sedimentation
- groundwater quality

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DWAF (various directorates)

- Dir: Institute for Water Quality Studies (IWQS)
- Dir: Geomatics
- Dir: Hydrology
- Dir: Project Planning
- Dir: Geohydrology
- Dir: Social and Ecological Services-Department of Water Affairs and Forestry

Institute for Water Research - Rhodes University

Water Research Commission

Council for Geoscience

Chief Directorate of Surveys and Land Information - Department of Land Affairs

Computing Centre for Water Research - CCWR - c/o University of Natal

Weather Bureau

CSIR - Satellite Application Centre, Mikomtek