HSE Monitoring and Measuring

Couple of takeaways

- Monitoring and measuring key activities ensures that Hydro Group are meeting set objectives and legal and other requirements.
- Monitoring and measuring can help determine where improvements are required or where we are meeting our identified obligations.

What is this procedure for?

This procedure describes how the monitoring and measurement activities required for **safety & environment at all Hydro Group sites** are determined and implemented, including the use of any Monitoring and Measuring Equipment (MME).

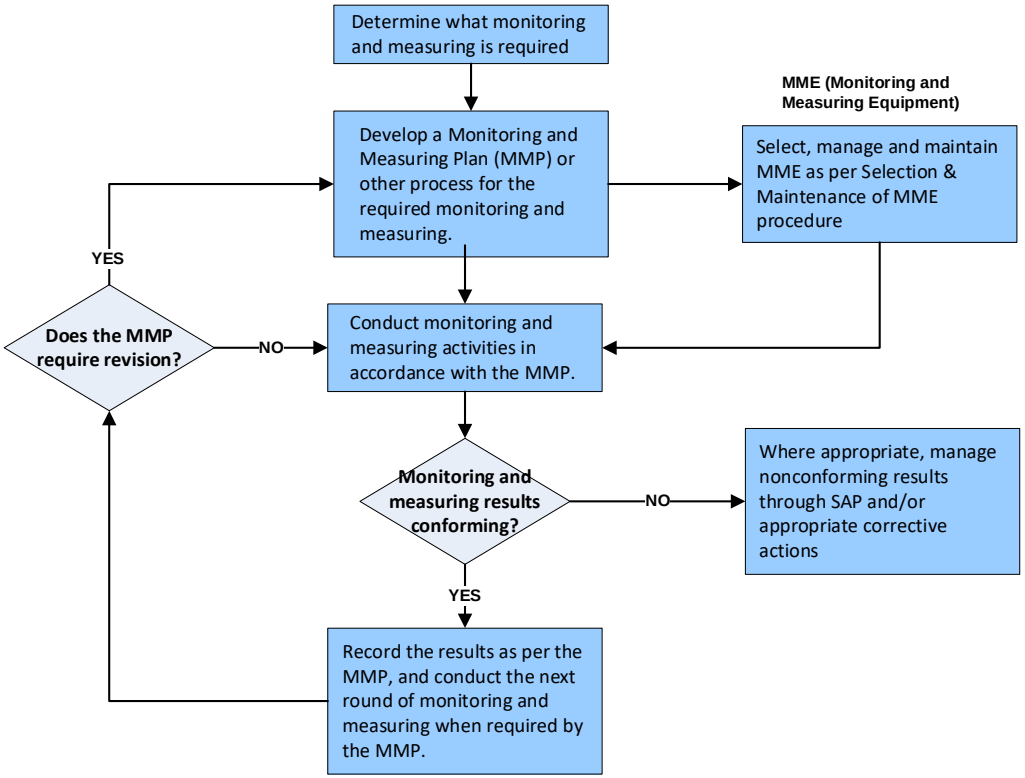
Key characteristics of the Hydro Group's activities, processes and Health, Safety and Environmental (HSE) performance have to be monitored and measured to determine if they are meeting set objectives, legal and other requirements. If these characteristics are not within the set acceptance levels, action needs to be taken to ensure protection of the environment and the health and safety of employees, contractors and the general public.

What is the monitoring and measuring process?

1) **The process for Monitoring and Measuring** is outlined in the below flowchart, with details of each step described below and on the following page. Table 1 outlines the Environmental Management System monitoring and measuring program. Table 2 outlines the Work Health & Safety monitoring and measuring requirements.

2) **Determine what monitoring and measuring** needs to be undertaken:

- To satisfy the Hydro Group's legal and other obligations for environment & safety
- To inform management of the status of Hydro Group's environment & safety performance and HSE system
- To capture requirements in a process (SAP, reporting framework etc.) or a Monitoring and Measurement Plan.



3) **Develop and document a process and/or Monitoring and Measuring Plan (MMP)**, considering the:

- Relevant risk assessments and the associated operational controls
- Type, frequency, extent of monitoring and measuring and the use of the results
- Need for the results to be lag or lead indicators; qualitative or quantitative
- Competencies, conditions and resources required
- MME required, its availability, accuracy, precision, and range (selecting it as per Selection and Use of Monitoring & Measuring Equipment Procedure)
- Compensation required for measurement variation and how to report it
- Inaccuracies that may occur because of human error in reading
- Tolerances for acceptable results and the actions to take for unsatisfactory results
- The records and reporting required.

4) The **designated and competent Worker conducts the monitoring and measuring** in accordance with the relevant process or MMP and if it involves the use of MME:

- Ensures that it has been calibrated/verified or is otherwise identified as fit for use. **Do not use** any MME that has been taken out of service and tagged or is suspect in any way.
- Considers any special job-specific verifications or calibrations required
- Prepares any supplementary Measuring Equipment Plans and/or equipment if needed because of unusual circumstances
- Records the piece of MME used for taking the measurements
- Performs any “pre-use” or operational checks required on the MME to ensure it is operating satisfactorily and that results are valid
- Does so in a manner that ensures the measurement uncertainty is known and consistent with the required measurement capability
- Ensure the conditions are suitable for the monitoring or measurements to be carried out as per the relevant process or Monitoring and Measuring Plan.

5) The **Worker** using the MME must protect it, as far as practicable, from damage during use and storage.

If MME is damaged, has an out-of-date calibration/ verification/check or is defective:

- Immediately taken out of service and tagged.
- Update the MME Records Database accordingly, and arrange its repair.

6) The **Worker** checks the monitoring/measuring results against the acceptable values and:

- Analyses and reports the results as defined in the process or MMP
- Where appropriate, if results are not conforming (or it is decided that the criteria are not appropriate), raises an incident in SAP for the non-conformance and identifies any initial corrective actions.
- Maintains records of the monitoring and measurement results.

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Table 1 EMS Monitoring & Measuring

What needs to be monitored and measured?	Methods, Criteria	Accountability
Environment & Climate Program of Works (PoW)	As outlined by PoW Environment & Climate Strategy Plans	Climate & Environment Manager
Energy & Emissions	Annual submission of National Greenhouse and Energy Reporting (NGER) submissions to the Clean Energy Regulator (CER) Annual submissions of National Pollution Inventory (NPI) reports to EPA Tasmania	Sustainability Advisor Chemical Technical Officer TVPS
Water quality & river health monitoring including water licence requirements	Outlined in Aquatic Program (water quality monitoring & river health monitoring documentation. Threatened species & PAMA matters)	Senior Aquatic Scientist Environmental Scientists
Environment Protection Notices (EPN)	EPN's for Hydro Tasmania including TVPS, as listed in ***sap***. TVPS EPN includes submitting monthly and annual reports to EPA Tasmania.	Chemical Technical Officer TVPS Environmental Scientists Environmental Planning & Policy Specialist
Wastewater treatment	Sampling occurring at Strathgordon, Gowrie Park and Poatina as per EPN compliance obligations. All samples are sent to Analytical Services Tasmania (AST) for analysis. TVPS performs monthly sampling from the Blivet Sewage System. These samples are collected by a contractor and analysed. Wastewater from the water treatment plant is continuously monitored, equipment calibrated monthly and monthly sampling is sent to Australian Laboratory Services Limited (ALS) for processing.	Environmental Scientist Works Officer / Maintenance Assistant Chemical Technical Officer TVPS
Raw water monitoring	Sampling occurring for Private Water Supply at Strathgordon and Poatina as per compliance obligations (Private Water Supply Registration-Local Council). All samples are sent to Analytical Services Tasmania (AST) for analysis. TVPS - Raw water is monitored continuously, probes calibrated monthly.	Environmental Scientist Maintenance Assistant / Works Officer Chemical Technical Officer TVPS

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Fuel storage	UPSS (Underground Petroleum Storage System): Pedder Wilderness Lodge, Wayatinah Village & Flinders Island (Whitemark) Power Station. Monitoring occurs as per compliance obligations (Environmental Management and Pollution Control (Underground Petroleum Storage Systems) Regulations 2020). Aboveground Petroleum Storage Systems: Gowrie Park Store and Mackintosh Power Station. Arcadia Energy service the tanks every 12 months TVPS above ground bunded diesel storage tanks, monitored monthly.	Manager Fleet & Travel Production Manager (FI) Production Managers Chemical Technical Officer TVPS
Biocycle Septic Systems	Power Stations (including Wayatinah/Trevallyn/Gordon/Lake Margaret/Poatina/Lake Echo/Tarraleah) Biocycles are inspected by an external plumber (Manion Plumbing) as required.	Power Station staff
Environmental Power Station Maintenance Checks (i.e. Triple Interceptor Pits)	Environmental infrastructure at the Power Stations such as the interceptor pits are monitored as part of ***sap routine inspections*** TVPS – Monitoring of oil waste separator daily, monthly samples as part of EPN.	Power Station staff Chemical Technical Officer TVPS
Hydrometric data & Remote Monitoring	As outlined in manuals for Generation operations requirements, water quality and dam surveillance data.	Hydrographic Data Coordinator Hydrometric Network Coordinator

Table 2 WHS Monitoring and Measuring

What needs to be monitored and measured	Method	Criteria
WHS Performance monitoring	SAP outputs Monthly reporting Management review Engagement survey analysis	Aligned with WHS objectives and targets
WHS Management System	Audits Management Review Control effectiveness review	
Health Monitoring	Prestart medical; medicals Hazard/incident reporting Audiometric testing Engagement survey analysis	Aligned with WHS objectives and targets Identified through legal and other requirements Needs and expectations of interested parties
Legal and other requirements	Changes monitored through enviro essentials subscription Legal and other requirements procedure	Identified and scoped through legal and other requirements Needs and expectations of interested parties
Activities and operations related to identified hazards, risks and opportunities	Monitoring and measuring conducted as identified in risk register or other risk assessment process (E.g. dust monitoring, noise monitoring etc.) Hazard/Incident reporting	Identified through risk assessment process, including effectivene controls Identified through legal and other requirements Needs and expectations of interested parties
Equipment	As outlined in Selection and Use of Monitoring and Measuring Equipment. As outlined by manufacturer or other identified requirements SAP maintenance / inspection schedule or work order Pre-start / pre-use requirements	As per manufacturer or other specifications