

# **GUIDELINES FOR COMPREHENSIVE SURVEILLANCE REPORTS**

**November 2018**

**Version 3.0**

**Water Operations Branch  
Department of Primary Industries, Parks, Water and Environment**



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## **1. Introduction**

These *Guidelines for Comprehensive Surveillance Reports November 2018* (the Guidelines) replace the previous *Guidelines for 5 Year Dam Safety Surveillance Report DPIPWE May 2013*.

Comprehensive surveillance inspections and reports are required activities under the *Water Management (Safety of Dams) Regulations 2015* (the Regulations) for all dams including mine tailings and effluent storage dams with a Consequence category of Significant or above. The Regulations also set out the competency class level requirements for practitioners who undertake dam safety activities in Tasmania.

The Guidelines have been developed to assist dam engineers and consultants when undertaking comprehensive surveillance inspections and when comprehensive surveillance reports are prepared. The Guidelines should be used as far as practicable to ensure that relevant matters are covered and reported on and there is consistency in reports the Department receives. However, it is expected that the engineer or consultant undertaking a comprehensive surveillance inspection and preparing a report acts under a certain amount of autonomy.

The Guidelines have been developed in accordance with Australian National Committee on Large Dams (ANCOLD) *Guidelines on Dam Safety Management August 2003* and *Guidelines on Tailings Dams May 2012*.

Due to Tasmania's unique circumstances - such as its legislative requirements for dam safety and emergency management, geographical and geological settings- it has been necessary to develop these guidelines over and above what is contained within the above ANCOLD Guidelines.

The Guidelines are to be used for all embankment type dams however, concrete type dams may require different inspection criteria and thus the report will need to reflect this. Dam owners with concrete dams should engage a dams engineer experienced in concrete type dams to undertake specific comprehensive surveillance inspections and develop appropriate reporting structure that will meet the Guidelines.

## **2. Guideline Requirements**

### **2.1 Competence Class**

In undertaking comprehensive surveillance inspections and reports, the Regulations specify the competence class required by practitioners undertaking this activity for water storage dams including mine tailings and effluent storage dams. Table 1 and 2 outlines the competence class required.

However, for higher Consequence category dams, the dam owner has a duty of care to look after the dam and part of this should be routine inspections so that any potential issues that may compromise the integrity of the dam can be identified and made good in a timely manner. These routine inspections should be undertaken on at least a weekly basis by the dam owner and require no class of competence in doing this. To keep track of the details of these routine inspections, it is suggested that the dam owner keeps a diary.

**Table 1 Competence class required for comprehensive surveillance inspections and reports for dams**

Dam height (m)	Consequence Category						
	Very Low	Low	Significant	High C	High B	High A	Extreme
is less than 10m	No specific class required	Class 2	Class 2	Class 1	Expert team	Expert team	Expert team
is 10m or more but not more than 25m	Class 2	Class 2	Class 1	Class 1	Expert team	Expert team	Expert team
is more than 25m	Expert team	Expert team	Expert team	Expert team	Expert team	Expert team	Expert team

**Table 2 Competence class required for comprehensive surveillance inspections and reports for tailings dams**

Consequence Category						
Very Low	Low	Significant	High C	High B	High A	Extreme
No specific class required	Class 1	Class 1	Class 1 or Class 3			

## 2.2 Report Acceptance by the Department

The Guidelines provide the minimum standard when undertaking comprehensive surveillance inspections and reporting. A submitted comprehensive surveillance report that does not address the basic requirements of the Guidelines will not be accepted by the Department and will be referred back to the dam owner. Note that the consultants undertaking the inspection and report will need to act under a certain amount of autonomy as each dam will be different.

## 2.3 Report Frequency

For water and effluent storage dams with a Consequence category of Significant and above, a comprehensive surveillance inspection and report must be undertaken on the first filling then every five (5) years for the life of the dam.

For mine tailings dams with a Consequence category of Significant and above, a comprehensive surveillance inspection and report must be undertaken on the first year of operation, then every two (2) years for High C and above tailings dams and every five (5) years for tailings dams with a Consequence category of Significant.

At the completion of each comprehensive inspection, a report on the inspection is to be prepared in accordance with the Guidelines.

## 2.4 Report Assessment Fee

When a report is assessed by the Department, a fee in accordance with the Regulations will be charged for the time spent in assessing the report. A minimal fee of \$94.80 (FY2018-19) for each half hour assessing the report will be charged.

### 3. Preparation of a Comprehensive Surveillance Report

In preparing a Comprehensive Surveillance Report regardless of Consequence category or dam height, the following sections and Appendix 1 of the Guidelines should be read and understood prior to undertaking a comprehensive inspection and compiling the report.

#### 3.1 Assessing the Consequence Category

In the first instance the Consequence category of the dam will need to be assessed in the preparation of the comprehensive surveillance report. The assessed Consequence category will then determine the required level of competence of the consultant undertaking the assessments which will mostly be a person with Class 1 Competence or an Expert Team in accordance with the *Water Management (Safety of Dams) Regulations 2015* requirements.

When assessing the Consequence category, the person undertaking the assessment will need to determine whether there will be Potential for Loss of Life and therefore the need to prepare a Dam Safety Emergency Plan. See [dpipwe.tas.gov.au/water/dams/dam-safety](http://dpipwe.tas.gov.au/water/dams/dam-safety) for guidelines relating to the preparation of Dam Safety Emergency Plans.

Where there are multiples of features downstream of a dam at risk like dwelling/s and other significant features roads, bridges etc, a comprehensive flood assessment will need to be undertaken as described in the ANCOLD “*Guidelines on the Consequence Category for Dams*” 2012. The area downstream will need to be accurately surveyed as set out in the guidelines and the flood impact model will need to be undertaken for a range of dam failure scenarios using computer programs that consider at least one dimensional unsteady open channel flow such as HEC-RAS (Hydrologic Engineering Center-River Analysis System).

#### 3.2 Detailed Visual Surveillance Assessment of the Dam

The overall condition of the dam needs to be assessed and the following inspection items need to be considered:

- The overall condition of the dam’s embankment, including batters, movement, cracking, or slumping, taking into consideration information previously collected from routine inspections;
- Existence of trees, rabbit or wombat holes on the embankment which might impact on its structural integrity;
- Deficiencies in the spillway capacity (see Section 3.3 for further on this) or whether the spillway has become blocked;
- Condition of the spillway and the return slope including any undercutting or erosion;
- Condition of the outlet pipe, outlet pipe valve and any appurtenant works that might impact on the structural integrity of the dam;
- Degree and location of seepage from the dam including discoloured water and any wet spots on the dam embankment;
- Erosion due to wave action; and
- Debris inside the storage area that could block the spillway or damage the embankment.

### 3.3 Spillway Capacity

As part of the Comprehensive Surveillance Report the size of the spillway must be reassessed for its ability to pass the designed Annual Exceedance Probability (AEP) flood size recommended, based on the dams Consequence category and in accordance with the ANCOLD “*Guidelines on Selection of Acceptable Flood Capacity for Dams*” March 2000.

If the spillway capacity is assessed as being deficient a recommendation must be made to address this by providing a spillway design that provides the required dimensions needed to pass the recommended designed flood capacity.

### 3.4 Geological Desk Study

An understanding of the geology at the dam site is important in obtaining an understanding of the overall condition of the dam and potential failure risks. For example, is the dam constructed in an area or on a soil type prone to instability, landslip, or a soil type which is highly reactive (high shrink-swell characteristics) or prone to dispersion.

### 3.5 Geotechnical Investigations

**Please note** that an experienced dam engineer that meets the competence requirements will need to determine the level of geotechnical investigation for the dam.

In determining the overall condition of the dam, it may be necessary to undertake a detailed geotechnical investigation to establish whether there are any adverse geotechnical issues with the dam or its foundations.

This may include, but is not necessarily limited to, a visual assessment, excavation of test pits, drilling of bore holes and undertaking associated laboratory testing.

Adverse geotechnical conditions may include the identification of highly reactive, highly erosive or dispersive soils, unstable soil conditions and high water tables.

**Note: Where relevant;**

- **All soils must be classified according to the *Unified Soil Classification System (USCS)*.**
- **All soil testing must be carried out to AS 1289 Methods of Testing Soils for Engineering Purposes by a laboratory that has NATA Registration for the type of test being undertaken.**
- **All reporting including test pit or borehole logs must be carried out to AS 1726 *Geotechnical Site Investigations*. Log sheets and test certificates must be contained within the Appendix of the Comprehensive Surveillance Report.**

### 3.6 Guidelines and Standards

All Guidelines and Standards referred to above should be those quoted or the latest version, as amended or substituted from time to time. ANCOLD is currently due to publish new Guidelines on Selection of Acceptable Flood Capacity for Dams. The ANCOLD Guidelines on Dam Safety Management is also being reviewed, so it may be appropriate to refer to draft versions, as they become available.

#### **4. Recommendations**

The person who prepares the report must provide in the comprehensive surveillance report either:

- a statement that the dam is in an acceptable condition, requiring no work to be undertaken to meet relevant safety standards; or
- clear recommendations on action/s required to be undertaken to bring the dam up to an acceptable safety standard. Any recommendations must include a timeframe in which each action must be completed by, reflecting the urgency of each action.

It is suggested that recommendations or actions are placed within a table which details the nature of the recommendations and the priority that these should be undertaken, ie low, moderate, high or very high within the suggested timeframe.

Once the Department receives the Comprehensive Surveillance Report, Departmental staff will be in contact with the dam owner to discuss further actions (if any) that will be required to make good the condition of the dam.

Depending on the revised Consequence category of the dam and what remedial works (if any) are recommended to be undertaken, the Department will advise the dam owner of the approval process in undertaking remedial works.

In addition, depending on the revised Consequence category the Department may request that the dam owner prepare a Dam Safety Emergency Plan.

## **Further Information**

Dam Safety Coordinator

Water Operations Branch

Department of Primary Industries, Parks, Water and Environment

PO Box 46, Kings Meadows TAS 7249

Visit [dpiwwe.tas.gov.au/water/dams/dam-safety](http://dpiwwe.tas.gov.au/water/dams/dam-safety) or

Call (03) 6777 2236 for assistance or

Email [damsafety@dpiwwe.tas.gov.au](mailto:damsafety@dpiwwe.tas.gov.au)

Links: The *Water Management (Safety of Dams) Regulations 2015* and the *Water Management Act 1999* are available at <http://www.thelaw.tas.gov.au/>

## **ANCOLD Publications**

ANCOLD publications referred to in the Guideline are available from

<http://www.ancold.org.au/>

## **Submissions**

All Comprehensive Surveillance Reports must be provided as an electronic copy in PDF file format and submitted to [damsafety@dpiwwe.tas.gov.au](mailto:damsafety@dpiwwe.tas.gov.au)

## 5. Appendix 1 Suggested Format of a Comprehensive Surveillance Report

The following suggested headings should be detailed in a Comprehensive Surveillance Report.

- Executive Summary
- Table of Contents
- Introduction and dam dimensions table.
- Detailed assessment of the Consequence category and outcome of the assessment. (*See 3.1 Assessing the Consequence Category*)
- Detailed visual assessment of the dam and recording of any observed defects. (*See 3.2 Detailed Visual Assessment of the Dam*)
- Description of the local geology and whether there are mapped landslips, potentially dispersive soils etc at or around the dam site.
- Detailed assessment of the geotechnical conditions encountered at the dam site and their likely impacts on the structural integrity of the dam. Any geotechnical investigation work will need to be detailed within the appendix of the report which may include drilling or backhoe test pit logs, and associated laboratory test certificates.
- A detailed hydrological assessment and review of the sizing of the spillway. If the spillway capacity is assessed as being deficient, then a spillway design is to be provided.
- Detailed assessment of the condition of the outlet pipe and any other appurtenant works which may impact on the structural integrity of the dam.
- Detailed recommendations, including timeframes, of any work required to bring the dam to an acceptable safety standard and any monitoring equipment that should be installed on the dam including 'V' Notch weirs.
- The report is to be certified and dated by the person who undertook the inspection and prepared the report and noting the person's competence class, as defined in the Regulations.
- The dam owner, acknowledging the report and recommendations, must sign the report.
- Appendix:
  - Geotechnical logs and test certificates, if any.
  - ANCOLD Consequence Category spreadsheet and description of flood impacted areas.
  - Spillway calculations.
  - Photographic record.