

## **Dam Improvement Program – Frequently asked questions**

### **1. What is the Dam Improvement Program?**

Dams are long-life assets and require continual assessment, monitoring and maintenance. In Queensland, dam owners are responsible for the safety of their dams under the *Water Supply (Safety and Reliability) Act 2008* (the Act). The Department of Energy and Water Supply (DEWS) requires Seqwater to comply with the Queensland Dam Safety Management Guidelines under the Act. Like all dam operators across the country, we also seek to meet the national guidelines set by the Australian National Committee on Large Dams (ANCOLD).

We regularly monitor and assess our 26 referable dams throughout the year. Through this work, dams may be identified for upgrades to meet the Queensland Dam Safety Guidelines.

In recent years, we have upgraded a number of dams as part of our Dam Improvement Program, including Lake Manchester (2008), Borumba (2008), Hinze (2011), North Pine (2012), Ewen Maddock Stage 1 (2012) and Maroon and Moogerah (2014).

### **2. Which dams are included in the program?**

All 26 referable dams regulated under the *Water Supply (Safety and Reliability) Act 2008*.

### **3. Why do dams need upgrading?**

Many of our dams were built in the 1960s and 1970s (some even earlier). Over the years there have been many changes which affect the way we manage the dams including:

- significant development and population growth downstream of our dams
- advances in dam design and construction
- new ways of estimating extreme rainfall and flood events
- greater understanding of the size and severity of earthquakes
- increased regulation for operating and maintaining dams to the highest environmental and safety standards.

All these factors are considered as part of the Dam Improvement Program so our dams operate as they should, now and into the future.

### **4. Does the need for a dam upgrade mean the dam is unsafe?**

No. Queensland has a good dam safety record, but just like cars, dams need regular checks and maintenance to keep them in good working order. The engineering and safety features of cars have improved over time and so too have those of dams. The Dam Improvement Program is about upgrading our dams in line with the latest engineering standards, while meeting the current Queensland dam safety guidelines.

### **5. How long do dam upgrades take?**

Dams are long-life assets and require continual assessment, monitoring and maintenance. Once a dam has been identified for upgrade, investigations and planning are needed to determine the scope, estimated cost and timing of work.

Where possible, the water levels of dams may be lowered until upgrades can be done. Lowering the water level reduces the load on the dam and allows more air space for the dam to pass excess water safely.

Every dam upgrade is different – some may take several months, while others take years to complete. Typically, the key stages of a dam upgrade are:

- Dam safety review (up to nine months)
- Options analysis and concept design (up to nine months)
- Preliminary design and approvals (up to 12 months)
- Detailed design and approvals (up to 12 months)
- Project planning (up to six months)
- Construction (between six months and up to five years).

Dam improvements are prioritised across the region in a staged program that is scoped and scheduled to maintain water supply security, while delivering best value for money. The timing of dam upgrades may change based on the outcome of ongoing investigations.

## 6. Why does Seqwater monitor and assess dams?

Our dams play a vital role in the SEQ Water Grid, providing the bulk of our drinking water in South East Queensland. Their continued performance and safety is critical to South East Queenslanders. While legislation requires us to monitor and assess the dams regularly, we see it as an integral part of our day-to-day business.

Regular monitoring helps us to determine whether our dams are operating the way they were designed to and detect any changes in their performance. Condition and safety assessments help us respond to these changes, as well as comply with current safety guidelines.

## 7. How does Seqwater monitor and assess dams?

Seqwater has an extensive dam safety management program, which includes daily visual inspections, routine safety audits and comprehensive assessments.

Frequency	Activity
Daily	Visual inspection – major dams Seepage inspection – all dams
Weekly	Visual inspection – minor dams Piezometer reading (measuring the water pressure within the embankment)
Monthly	Inclinometers – measure movement within the embankment More frequent inspections are made if an abnormal reading is received
Every year	Dam safety inspection and audit - internal experts Inspection report submitted to the Dam Safety Regulator
Every 5 years	Comprehensive dam safety condition assessment and audit - internal experts Inspection report submitted to the Dam Safety Regulator
Every 20 years	Independent safety review including a review of changes to loads and standards Certified by a Registered Professional Engineer (Queensland) Inspection report submitted to the Dam Safety Regulator

Our dam operators complete daily visual inspections of our major dams, such as Somerset and Wivenhoe, and weekly visual inspections of our smaller dams. These inspections help us identify any changes in the condition and performance of our dams that may need investigation.

We use specialist equipment to check dams for abnormal movement, changes in groundwater pressure and water seepage. Any measurements outside acceptable limits can alert us to possible changes in the dam's operation and trigger further investigations. Independent surveyors are engaged each year to measure and assess dam embankments for movement and we have specialist engineers who inspect our dams every year to help us plan dam maintenance.

A comprehensive inspection of each dam is undertaken every five years to review performance in greater detail. Every 20 years, we are required to commission an independent review of our dams against current design standards and safety guidelines.

All inspection reports are submitted to the Dam Safety Regulator once complete.

### **8. What factors are considered when assessing dams?**

We engage both internal and external experts to assess the safety of our dams and they consider factors such as:

- downstream development and population growth
- changes to design standards and current safety guidelines
- the condition of the dam structure and associated instrumentation
- the latest available rainfall estimates and flood modelling
- the latest estimates of earthquake loads
- how the dam was designed and constructed.

### **9. What has the latest dam safety review found?**

In 2012-13, we commissioned an independent review of our 26 referable dams, which found improvements are needed at a number of our dams to meet Queensland dam safety guidelines into the future. Significant changes affecting the way we manage our dams included:

- **Increasing populations downstream** – there has been an exponential increase in population and development downstream since many of our dams were built.
- **Greater understanding of extreme weather** – what we know about floods and earthquakes has increased as a result of events in Australia and around the globe.

We have prioritised a program of dam upgrades in a staged approach to give us time to scope, design and plan, while maintaining public safety, security of water supply and delivering the best value for money.

In response to the independent review, we have taken a range of actions, including lowering the drinking water storage levels of eight dams – Bill Gunn Dam (Lake Dyer) near Laidley, Cooloolabin Dam on the Sunshine Coast, Leslie Harrison Dam at Capalaba, Sideling Creek Dam (Lake Kurwongbah) and North Pine Dam at Petrie, Nindooinbah Dam in the Scenic Rim, and Wivenhoe and Somerset dams in the Somerset region.

We have upgraded Ewen Maddock Dam (Stage 1), Moogerah Dam (Stage 1a) and Maroon Dam (Stage 1). We have also increased our monitoring of the 14 dams identified for further investigations and potential upgrades under the Dam Improvement Program.

## **10. Which dams need upgrading?**

Dams identified for further investigation and potential upgrade in the next six years include:

- Sideling Creek Dam (Lake Kurwongbah)
- Lake Macdonald Dam (Six Mile Creek Dam)
- Wappa Dam (in progress)
- Somerset Dam
- Ewen Maddock Dam (Stage 2)
- Cooloolabin Dam.

The timing of possible upgrades depends on the outcomes of ongoing investigations and planning.

Dams to be considered further for potential upgrades by 2035 include:

- Leslie Harrison Dam
- Wivenhoe Dam
- North Pine Dam
- Little Nerang Dam
- Maroon Dam
- Atkinson Dam
- Borumba Dam.

## **11. Why are dam levels lowered?**

Lowering water levels is an industry-accepted practice to best manage the safety of dams either temporarily or in the long term. Lowering the water level in a dam reduces water pressure and loads on the dam wall, and can also create temporary storage to increase its capacity to mitigate floods.

## **12. How long will dam water levels remain lowered?**

In some cases, the reduced water levels will be temporary while we conduct investigations and upgrade the dam. In other cases, permanently lowering the water level in the dam may be a cost-effective solution to meeting the relevant safety guidelines in the long term.

## **13. How do you lower dam levels?**

There are different ways to lower water levels depending on the type of dam and how much water needs to be released. For example, to lower Somerset Dam, which is a gated dam, we used the outlet valves to release water at a slow rate over several weeks. To lower Sideling Creek Dam (Lake Kurwongbah), which is an un-gated dam, a slot was cut in the concrete crest at the upstream end of the spillway. In both cases, measures were put in place to lower the lake levels gradually and safely, while protecting water quality and the environment.

## **14. How does lowering water levels affect water quality and the environment?**

We monitor water quality and the environment before, during and after lowering water levels. To minimise the impact of lowering the dam on water quality and the environment, the stored water is released at a slow, controlled rate.

**15. Will the Dam Improvement Program impact my water bill?**

The cost of the Dam Improvement Program has been built into the current bulk water price path and will not impact the bulk water component of your water bill.