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# Introduction

This guideline provides information to assist proponents when seeking approval from the Department of Natural Resources, Mines and Energy (DNRME) for either a permanent or temporary watercourse diversion when making application for a water licence under the *Water Act 2000* (Water Act).

Where a watercourse diversion is proposed as part of a resource activity as defined in the *Environmental Protection Act 1994* (EP Act), regulatory approval for the diversion may occur as part of an environmental authority (EA) without the requirement of a water licence under the Water Act. A separate guideline is provided for these resource activity related watercourse diversions that can be authorised under the EP Act.

Watercourse diversions requiring authorisation under the *Water Act 2000* must meet the outcomes as defined within this guideline. Proponents are encouraged to contact DNRME for further guidance prior to submitting an application for a water licence.

There are four (4) parts to this document.

## **Part 1 Overview and application process**

Part 1 contains introductory information of the application process requirements for a water licence for watercourse diversions.

## **Part 2 Manual**

Part 2 contains information on the technical requirements to develop a functional design, design plan and an operation and monitoring plan for watercourse diversions.

## **Part 3 Certification process**

Part 3 contains information that will assist proponents and certifiers in understanding certification requirements.

## **Part 4 Guidance information**

Part 4 contains information that will assist proponents and certifiers in understanding watercourse diversion design and certification requirements.







































































A permanent watercourse diversion that relies on structures requiring ongoing maintenance to manage in-stream hydraulic conditions place an unacceptable, ongoing liability on the proponent, government and community to maintain these features.

#### **Temporary watercourse diversions**

Temporary watercourse diversions may contain energy dissipation structures to alleviate elevated hydraulic conditions and avoid instabilities within the watercourse diversion and adjoining reaches. The design life of the energy dissipation structure should complement the intended operational life of the temporary watercourse diversion.

### **4.7 Guidance notes—operation and monitoring plans**

Watercourse diversions are not static and should be designed, operated and managed to replicate a functioning dynamic watercourse. A monitoring and evaluation plan<sup>7</sup> (within an operation and monitoring plan) should demonstrate that the watercourse diversion is developing and operating as designed and can identify issues before major instabilities occur that require significant rehabilitation. A monitoring and evaluation plan may also support any defence against a compliance/enforcement action and ultimately support the surrender of the water licence by providing evidence that the watercourse diversion is meeting, or is capable of meeting, the outcomes identified in Part 1.

**Table 14 – Guidance notes for operation and monitoring plans for watercourse diversions**

<b>Operation and Monitoring Plan guidance notes</b>
<p><b>Outcome 4 – Sediment transportation</b></p> <p>The selection of monitoring points must be appropriate to provide evidence on whether the sediment transportation regime is consistent with the intended outcome.</p>
<p><b>Outcome 5 - Equilibrium and Functionality</b></p> <p>A watercourse diversion is often most susceptible to changes to equilibrium from flow events at the commencement of operation. Increases in sediment generation rates can unduly impact the adjoining watercourse. The equilibrium and functionality of the watercourse diversion should be designed to minimise erosion by flow events immediately following commencement of operation.</p> <p><b>In-situ soil</b></p> <p>Soils are the basic resource that influences the establishment of vegetation that provides equilibrium to watercourse diversion surfaces. Different soil media may require remedial actions to assist with the establishment of vegetation.</p> <p>Soils descriptions should be undertaken using a soil classification system recognised in Australia, such as the Isbell, Raymond (2002) Australian Soil Classification 2nd Edition, CSIRO Publishing, and Australia.</p>

<sup>7</sup> Further information on monitoring and evaluation and the trajectory approach for watercourse diversions can be found in the ACARP project C90689068 report.



## Appendix A: Definitions

**Annual Exceedance Probability (AEP):** the probability that at least one flood event in excess of a particular magnitude will occur in any given year.

**Associated structures:** infrastructure that is associated with the operation of the watercourse diversion such as batter chutes, rock revetment works and levees. Australian Coal Association Research Program (ACARP): for watercourse diversions, see section 3 of this Guideline. Further information on ACARP can be found at [www.acarp.com.au](http://www.acarp.com.au).

**Catchment yield:** Surface runoff generated from a rainfall event from a watershed or catchment.

**Certification:** means assessment and endorsement must be undertaken by a suitably qualified and experienced person in relation to any assessment or documentation required, including design plans, 'as constructed' drawings and specifications, construction, operation or reports regarding watercourse diversions.

**Channel capacity:** the capacity of the channel during bank-full flow events.

**Chief executive:** The agency that administers the water licence provisions under the *Water Act 2000*.

**Component expert:**

*Geomorphologist:* person who has demonstrated competency and relevant experience in stream geomorphology and watercourse diversions.

*Geotechnical expert:* person who has demonstrated competency and relevant experience in geotechnical assessment of soil characteristics suitable for watercourse diversions.

*Vegetation expert:* person who has demonstrated competency and relevant experience in the identification, role and function of vegetation with watercourses and adjoining floodplains, and has demonstrated competency and relevant experience in revegetation of watercourse diversions and adjoining floodplains.

*Groundwater expert:* person who has demonstrated competency and relevant experience in groundwater systems.

*Surface water expert:* person who has demonstrated competency and relevant experience in hydrology.

*Engineer:* person who is a Registered Professional Engineer of Queensland (RPEQ) under the provisions of the *Professional Persons Act 2002* or has similar qualifications under a respected professional registration association, and has demonstrated competency and relevant experience in design and construction of watercourse diversions.

*Soils expert:* person who has demonstrated competency and relevant experience in soil classification including the physical, chemical and hydrologic analysis of soil.

**Construction or Constructed:** is the process of building a new or modifying an existing watercourse diversion, but does not include investigations and testing necessary for the purpose of preparing a design plan.

**Design plan:** is a document that contains the 'detailed' information regarding the design, operation, monitoring and revegetation of a watercourse diversion that addresses the outcomes stated in the *Guideline: Works that interfere with water in a watercourse for a resource activity—watercourse diversions authorised under the Water Act 2000*.



**Drop structure:** is a man-made structure that passes water to a lower elevation while controlling the energy and velocity of the water. Drop structures assist with water oxygenation and erosion prevention.

**Environmental Authority (EA):** see Schedule 4 of the *Environmental Protection Act 1994*.

**Environmental value:** see section 9 of the *Environmental Protection Act 1994*.

**Equilibrium:** A state where 'balance' is achieved despite changing variables.

**Functional design:** is a document that contains 'conceptual' information about the design, operation and revegetation criteria of a watercourse diversion that addresses the outcomes stated in the *Guideline: Works that interfere with water in a watercourse for a resource activity—watercourse diversions authorised under the Water Act 2000*.

**Functionality:** the purpose that something is designed or expected to fulfil.

**Holder:** for a mining tenement, means a holder of the tenement under the *Mineral Resources Act 1989* or, for an environmental authority, the holder of an environmental authority under the *Environmental Protection Act 1994*.

**Interfere:** see Chapter 2 of the *Water Act 2000*.

**Levee:** an embankment that provides for the containment and diversion of stormwater or flood flows from a contributing catchment, or containment and diversion of flowable materials resulting from releases from other works, during the progress of those stormwater or flood flows or those releases; and does not store any significant volume of water or flowable substances at any other times.

**Licensee:** the holder of a water licence issued under the *Water Act 2000*.

**Minimise:** to reduce to the smallest possible amount or degree.

**Permanent watercourse diversion:** is a man-made structure that incorporates the geomorphologic, hydraulic, hydrologic and ecological components of a local watercourse and is designed, constructed, operated and maintained according to an engineering standard that ultimately achieves a self-sustaining watercourse able to function without features or characteristics that rely on ongoing maintenance or that impose a financial or other burden on the proponent, government or the community.

**Pre-existing watercourse:** the section of watercourse from which the flow of water will be diverted as a result of the construction and operation of a watercourse diversion. **Rehabilitation:** the process of stabilising and revegetating mining activity disturbance. **Revegetation:** the re-establishment of vegetation on soil surfaces associated with the construction or rehabilitation of a watercourse diversion.

**Resource activity:** See section 107 of the *Environmental Protection Act 1994*.

**Self-sustaining:** A self-sustaining watercourse diversion functions without features or characteristics that rely on ongoing maintenance or that impose a financial or other burden on the proponent, government or the community.

**Spoil:** overburden and other substrate material removed from the ground, relocated and stored or stockpiled as part of a resource activity.

**SEQP** means a suitably qualified and experienced person: a person who is a Registered Professional Engineer of Queensland under the provisions of the *Professional Engineers Act 2002*, and has an

appropriate level of expertise in the structures, geomechanics, hydrology, hydraulics and environmental impact of watercourse diversions.

**An appropriate level of expertise** includes:

- a) demonstrable competency, experience and expertise in–
- b) investigation, design or construction of watercourses diversions
- c) operation and maintenance of watercourse diversions
- d) geomechanics with particular emphasis on channel equilibrium, geology and geochemistry
- e) hydrology with particular reference to flooding, estimation of extreme storms, water management or meteorology
- f) hydraulics with particular reference to sediment transport and deposition and erosion control
- g) hydrogeology with particular reference to seepage and groundwater solute transport processes and monitoring thereof
- h) sufficient knowledge and experience to certify that where the suitably qualified and experienced person has relied on certification provided by other component expert/s\*– they consider it reasonable to rely on that advice and information
- i) the expert providing the advice and information has knowledge, competency, suitable experience and demonstrated expertise in the matters related to watercourse diversions.

**Temporary watercourse diversion:** is a man-made structure that may incorporate geomorphologic, hydraulic, hydrologic and ecological components of a local watercourse and is designed, constructed, operated and maintained to a lower engineered standard than a permanent watercourse diversion but must not compromise the equilibrium and performance of the watercourse diversion and adjoining watercourses.

**Tenement:** means tenure under the *Mineral Resources Act 1989, Petroleum and Gas (Production and Safety) Act 2004, Petroleum Act 1923, Geothermal Energy Act 2010 or Greenhouse Gas Storage Act 2009.*

**Tie-in location:** the location at which a watercourse diversion joins an existing watercourse or drainage feature.

**Void:** any manmade open excavation in the ground.

**Water:** See Schedule 4 of the *Water Act 2000.*

**Water users:** persons or entities that hold an existing water entitlement and authorisation to take or interfere with water under the *Water Act 2000.*

**Watercourse:** see sections 5 and 5A of the *Water Act 2000* and Part 1, Division 2 of the *Water Regulation 2016.*

**Watercourse diversion:** a man-made structure that diverts or interferes with the course of flow within a watercourse, but that does not impound

## Appendix B: Form of certification for suitably qualified and experienced person

- Form of certification (watercourse diversion)
- Name of registered professional engineer providing certification
- Address of registered professional engineer providing certification

### Statement of certification

I hereby state that I meet the requirements of the definition of 'suitably qualified and experienced person' for watercourse diversions as stated in *<insert relevant environmental authority or, for a functional design, the relevant model condition guideline>*.

### Statement of certification

I hereby certify that the *<functional design/detailed design plan/construction report/as constructed drawings>* titled *<report name/ref>* and dated *<date>* for the *<name of watercourse diversion>*:

- Relates to watercourse diversion of *<name or description of water course>* between *<co-ordinates or description of upstream limit of watercourse diversion>* and *<co-ordinates or description of downstream limit of watercourse diversion>*
- Includes all relevant material relied on by me
- Is in accordance with all relevant requirements of the *<insert relevant environmental authority or, for a functional design, the relevant model condition guideline>*
- *<Includes component certifications for the following specialist components: .....>*
- Is in accordance with all relevant conditions of *<name of Environmental Authority>*

I further certify that the component certifications for the specialist components listed above are appropriate and that the content of those certifications can be relied on in determining that the watercourse diversion design will achieve required outcomes.

*<Identify, where appropriate, what is not included in the certification - including information about any limitations, restrictions or exclusions that apply to the certification>*

I *<full name of person making the declaration>*, declare that the information and opinions provided as part of this certification is true to the best of my knowledge and belief. I acknowledge that it is an offence under section 480 of the *Environmental Protection Act 1994* to give the administering authority a document containing information that I know is false, misleading or incomplete in a material particular.

**Signed:** .....

**[Signature of certifier/including registered professional engineer reference number/s]**

**Date:** .....

## Appendix C: Form of Certification for Component Expert

- Form of certification (watercourse diversion)
- Name of professional person providing certification
- Address of professional person providing certification

**Note:** Not required by the administering authority – this may be completed and submitted at the discretion of the suitably qualified and experienced person

### Statement of certification

I hereby state that I meet the requirements of the definition of 'component expert' for *<type of expert>* as stated in *<insert relevant environmental authority or, for a functional design, the relevant model condition guideline>*.

### Statement of certification

I hereby certify that the *<description of component>* entitled *<report name/ref>* and dated *<date>* for the *<name of watercourse diversion>*:

- Relates to watercourse diversion of *<name or description of water course>* between *<co-ordinates or description of upstream limit of watercourse diversion>* and *<co-ordinates or description of downstream limit of watercourse diversion>*
- Includes all relevant material relied on by me
- Is in accordance with all relevant requirements of the *<insert relevant environmental authority or, for a functional design, the relevant model condition guideline>*
- Is in accordance with all relevant conditions of *<name of Environmental Authority>*

*<Identify, where appropriate, what is not included in the certification - including information about any limitations, restrictions or exclusions that apply to the certification>*

I *<full name of person making the declaration>*, declare that the information and opinions provided as part of this certification is true to the best of my knowledge and belief. I acknowledge that it is an offence under section 480 of the *Environmental Protection Act 1994* to give the administering authority a document containing information that I know is false, misleading or incomplete in a material particular.

**Signed:** .....

**[Signature of certifier/including professional qualification or affiliation]**

**Date:** .....