Procedural guide

Environmental Protection Act 1994

Releases to waters from land development sites and construction sites 2500m^2 and greater

This document has been prepared to provide officers, authorised under *the Environmental Protection Act 1994* (EP Act), with a tool for undertaking erosion and sediment control (ESC) compliance inspections and guidance to apply enforcement provisions under the EP Act at land development and construction sites on land 2500m^2 or greater.

Table of Contents

Framework

This procedural guide is applicable across all Queensland. It is prepared for officers of the department; however local governments may adopt these procedures to encourage greater consistency in the administration and enforcement of the EP Act for land development and construction sites across Queensland.

A complimentary state-wide procedural guide has been prepared to address releases to waters from building and smaller constructions sites less than 2500m^2. These sites are not assessed and conditioned against the State Planning Policy (SPP) water quality State interest assessment benchmark or equivalent provisions in local planning instrument.

Context

Stormwater run-off from land development and construction sites has a high potential to cause water contamination and/or environmental harm. Under section 440ZG of the *Environmental Protection Act 1994* (EP Act) it is an offence to unlawfully deposit a prescribed water contaminant in or in such a way where it could reasonable enter a roadside gutter or stormwater drain. Prescribed water contaminants are listed in Schedule 10 of the Environmental Protection Regulation 2019 and include cement, concrete, clay, sediment, stones and plaster, among other construction related materials,

It is the responsibility of the occupier of a land development and construction site to ensure appropriate measures are in place to prevent environmental harm and uphold the General Environmental Duty (GED) under section 319 of the EP Act.

The assessment of appropriate measures in relation or stormwater run-off is required when determining if an offence may have occurred and if the GED has been upheld.

Purpose

The purpose of this document is to provide guidance to officers authorised under the EP Act relating to:

- determining the lawfulness of releases to waters for land development and construction sites greater than 2500m[1]
- undertaking inspections of stormwater management and erosion and sediment control during the construction phase of land development and construction sites
- the enforcement provisions of the EP Act on land development and construction sites, greater than 2500m^2, including development occurring as a result of Reconfiguring a Lot, Operational works, and Material Change of Use Development Approvals.

When implemented, the practices described in this procedural guide will help achieve water quality objectives and management goals, which in turn will help protect or enhance environmental values of Queensland waterways.

[1] Development on sites below 2500m^2 are currently not required to be assessed under the State Planning Policy State Interest Water Quality Assessment benchmark provisions or equivalent provisions within a local planning instrument (Planning Scheme). 2500m^2 is also the standard (default) contributing catchment area where the Best Practice Erosion and Sediment Control document (IECA 2008 as amended) recommends the use of sediment basins ('Type 1' sediment control devices). Sites below this 2500m^2 land area will generally not be required to prepare detailed ESC plans or to use Type 1 controls.

How to use this document

This procedural guide contains the following appendices:

- Appendix 1: Advisory notes: Standard work method to assess the lawfulness of releases to waters from land development/construction sites 2500m^2 and greater.
- Appendix 2: Checklist: Rapid standard work method to assess the lawfulness of releases to waters from land development/construction sites 2500m^2 and greater.
- Appendix 3: Flowchart: General Compliance and Enforcement considerations and responses for land development/construction sites 2500m^2 and greater.

Officers should use the Appendix 1 advisory notes for the standard work method when they require detailed explanations of how to undertake a compliance inspection. As officers become more familiar with undertaking site inspections they may wish to use the checklist version at Appendix 3 for the standard work method.

For either version, if no actual or potential water contamination is identified in Part A, no enforcement action is required. However, if there is actual or potential water contamination identified in Part A, authorised officers can refer to Part B to assess the lawfulness of the release and Part C to assist in making consistent and proportional enforcement responses to offences.

If no actual or potential water contamination is identified in Part A, then good practice erosion and sediment control should be recorded in the site/operator compliance history and, where suitable, be specifically acknowledged in the post inspection letters as a positive encouragement mechanism.

Matters devolved to local government

The Environmental Protection Regulation 2019 (EP Regulation) states that the following matters are devolved to local government:

- environmental nuisance – sections 440 and 443 of the EP Act (to the extent it relates to environmental nuisance), including offences relating to nuisance
- water contamination – chapter 8, part 3C of the EP Act, including the offence of depositing prescribed water contaminants in waters under section 440ZG.

If a matter is devolved, the relevant local government is responsible for the administration and enforcement of those devolved matters for its local government area. Local governments have powers to use statutory instruments under the EP Act in relation to devolved matters. An information sheet is available for further information.

Legal requirements

Stormwater run-off from land development and construction sites has a high potential to cause water contamination and/or environmental harm. This is regulated under the EP Act, specifically s.440ZG and s.319, (all section references refer to the EP Act unless otherwise specified).

- Under section 440ZG, it is an offence to
    - unlawfully deposit a prescribed water contaminant[2] in waters or in a roadside gutter or stormwater drainage or at another place, in a way that the contaminant could reasonably be

[2] Prescribed water contaminants are listed in Schedule 10 of the Environmental Protection Regulation 2019

expected to wash, blow, fall or otherwise move into waters a roadside gutter or stormwater drainage
    - unlawfully release stormwater run-off into waters, a roadside gutter or stormwater drainage that results in the build-up of earth in waters, a roadside gutter or stormwater drainage.

- Under section 319, persons in Queensland carrying out activities which may cause environmental harm must comply with the general environmental duty (GED). Demonstrating that all reasonable and practicable measures have been adopted to prevent and minimise environmental harm is a defence for offences such as release of prescribed water contaminants.
- Reference must be made to s.493A when a decision is made about the unlawfulness of water contamination, for instance where the release is authorised under a development approval.
- Schedule 1 (EPP Water and Wetland Biodiversity) provides a process for protecting Queensland waters by establishing environmental values and water quality objectives for many waters of the state[3].
- For waters not included in Schedule 1, the EPP Water and Wetland Biodiversity provides a process for determining the environmental values and water quality objectives.
- Section 15, Environmental Protection (Water and Wetland Biodiversity) Policy 2019 (EPP Water and Wetland Biodiversity) establishes a hierarchy of preferred management options for wastes, including water contaminants which, when applied, protects or enhances the environmental values of waters.

This Procedural Guide does not limit the discretion that authorised officers are required to exercise. The department's Enforcement Guidelines provide broader guidance on the department's approach to compliance and enforcement for all legislation under its jurisdiction.

It is recognised that complementary enforcement provisions of other legislation may also be considered during enforcement decisions such as those that exist under the *Planning Act 2016* (Planning Act). Development assessment conditions, under the Planning Act, may reference the stormwater management design objectives published in the State Planning Policy – Water Quality State Interest (see the Department of Local Government, Racing and Multicultural Affairs website for the latest version), and specifically in the Assessment Benchmarks – water quality and Appendix 2 – Stormwater management design objectives Table A: Construction phase-stormwater management design objectives.

State Planning Policy 2017 State Interest Water quality

Since 2011, rather than relying on the provisions of the EP Act for compliance, State planning policies have required:

- local planning schemes to include measures for better erosion and sediment controls based on default provisions derived from the Best Practice Erosion and Sediment Control document (IECA 2008)
- proposed measures to be documented in development applications for assessment
- minimum standards to be implemented during construction or at the operational works phase of development.

With the commencement of the Planning Act on 3 July 2017, the new *State Planning Policy July 2017* (SPP) also commenced and requires operators to control stormwater released during construction by achieving

* **Note**: the offence contemplates that an offence may occur before the actual depositing of a contaminant has occurred at another place, i.e. "could reasonably be expected" thus compliance action can be initiated by an Authorised Officer if they are of the reasonable belief that the offence could occur.
[3] The department website has maps of catchments where Environmental Values (EV) and water quality objectives (WQO) have been established or are under development.

'desired outcomes'[4]. The 2017 SPP Sediment control 'desired outcome' remains technology neutral but strengthens the level of sediment capture and retention to be achieved.

For information regarding the design and operation of best practice erosion and sediment control refer to the International Erosion Control Association website. This procedural guide reflects the SPP July 2017 design objectives, best practice erosion and sediment control measures and the consideration of their use as a means to demonstrate compliance with the general environmental duty.

[4] Please refer to Appendix 2 SPP July 2017, DLGRMA. Available https://dilgpprd.blob.core.windows.net/general/spp-july-2017.pdf

Appendix 1: Advisory notes: Standard work method for assessing the lawfulness of releases to waters from land development/construction sites 2500m^2 and greater

PART A - Assessment of actual or potential water contamination

Sediment build up

a) Has the activity caused, or does it have the potential to cause, sediment build up, through act or omission, in the receiving waters environment?

Under section 440ZG, it is an offence to unlawfully deposit 'prescribed water contaminants' in waters, roadside gutters, stormwater drainage or to place contaminants where, and in such a way that, they could run into such places. Prescribed water contaminants (a full list can be found in schedule 10 of the EP Regulation) include:

- clay, gravel, sediment (including from building activities), stones and similar organic and inorganic mater
- earth which s.440ZD of the EP Act defines as sand, soil, silt or mud.

Coarse sediment eroded from urban developments often accumulates temporarily in creeks downstream of the works. Sediment levels in the receiving environment should be documented by the person undertaking the activity or development before, during, and following completion of the development to assess the level of impact, if any, in accordance with development approvals. Simple sediment/erosion pins (or marked wooden stakes) could be used to determine the need for more detailed measurements. If there is, or is likely to be, a build-up of sediment in the receiving environment caused by the development, complete Part B—Assessment of lawfulness of deposit or release.

Releases

a) Has the activity caused, or does it have the potential to cause, releases, flows or discharges containing prescribed water contaminants to waters, roadside gutters or stormwater drainage?

Sediment leaving a construction site on the tyres of vehicles and being deposited where it could reasonably be expected to wash into a roadside gutter or stormwater drain is also likely to constitute a breach of s.440ZG.

If releases, flows or discharges are causing, have caused, or are likely to cause unlawful water contamination, complete Part B. In dry weather, it may be necessary to complete Part B to determine if the activity is likely to cause water contamination in a subsequent rain event.

If there are relevant conditions that limit releases from site and flows or discharges from the site to waters, roadside gutters or stormwater drainage cause, or have the potential to cause, water contamination, water quality sampling should be undertaken in accordance with the Department of Environment and Science Monitoring and Sampling Manual 2018[5]. This manual can be found on the department's website.

Appropriate sampling locations may include downstream, upstream and source point.

[5] Refer to current version available on the department's website www.des.qld.gov.au.

If the answer to either 1 or 2 is yes, proceed to Part B.

If the answer to both is no, then no further action is required at this time.

PART B - Assessing the lawfulness of depositing prescribed water contaminants or release of stormwater run-off

Part B of this guideline establishes practices which assist in defining what may constitute reasonable and practicable, which in turn assists with determining whether the requirements under the GED have been fulfilled.

Assessment of compliance with section 493A

a) *Is the release of the prescribed contaminant(s) and/or the build-up of sediment expressly permitted by a development condition of a relevant development approval?*

Under s.493A, an act which causes serious or material environmental harm, or a breach of s.440ZG, is unlawful unless it is authorised by one of the provisions listed in s.493A(2). These provisions include a release of a contaminant to waters under 'a development condition of a development approval'.

If a contaminant release is expressly permitted under any provision listed under s.493A, the release is considered lawful, so long as the release is within the permitted discharge limits (e.g. concentration and/or load or volume). If a release is not expressly permitted by a condition provision listed under s.493A, or the approval is silent on the matter, the lawfulness of the release needs to be determined by assessing compliance with s.319 General Environmental Duty (GED).

Assessment of compliance with the general environmental duty (GED)

Section 319 (GED) requires that all reasonable and practicable measures be taken to prevent or minimise environmental harm including water contamination and environmental nuisance. Demonstrating compliance with GED constitutes a defence against offences.

Erosion and sediment control plans

a) *Does a site-specific erosion and sediment control program or plan(s) exist?*
b) *Does the program or plan(s) for each phase of the works (including clearing, earthworks, civil construction, services installation and landscaping) detail the type, location, sequence and timing of measures and actions to effectively minimise erosion, manage flows and capture sediment?*
c) *Is the program or plan(s) consistent with current best practice standards, taking into account all environmental constraints including erosion hazard, season, climate, soil, and proximity to waterways?*
d) *Does the program or plan(s) address the management hierarchy for releases to waters outlined in s.15 of EPP Water and Wetland Biodiversity?*
e) *Have the ESC Plans been prepared by a suitably qualified professional? (e.g. Certified Professional in ESC (CPESC) or Certified Professional Soil Scientist (CPSS)?*
f) *Has the erosion and sediment control program or plan(s) been modified as necessary to address the changing physical condition of the site?*

The process of designing site-specific erosion and sediment controls for a site should include consideration of:

- erosion hazards for different parts of the site
- soil types, particularly dispersive, sodic and saline soils, and the suitability of the soil for establishing the intended vegetation type, as well as amelioration required to improve soil suitability
- high-risk construction activities such as works in or near waterways
- the available area required for effective erosion and sediment controls
- risk reduction strategies such as staging of works in manageable portions or covering exposed soils with binders, a cover crop or geo-textile
- seasonal climatic variations and implications for environmental risk
- local hydrology including groundwater and surface water
- local topography including temporary and surface flow paths
- the need to integrate the erosion and sediment control measures with earthworks, civil construction, services installation and landscape works including stormwater detention and quality treatment devices for the post-construction phase
- monitoring that may be required if the site drained directly to a watercourse or drainage line.

Prevention, reduction and treatment of contaminants

Section 15(2)(b) EPP Water and Wetland Biodiversity requires that the production of contaminants be prevented, or where not feasible, reduced.

Erosion should be minimised, and sediment capture maximised with a full suite of control measures as necessary to protect the environmental values, and in consideration of site attributes and risk factors, including antecedent weather conditions. If the production of contaminants cannot be prevented, the contaminated stormwater must be appropriately treated to ensure that releases will not affect the environmental values of waters (s.13(2)(c) and (d) EPP Water and Wetland Biodiversity).

Erosion control

Is non-essential exposure of soil avoided in terms of:

a) the extent of clearing is restricted to that necessary for access to, and safe construction of the approved works i.e. vegetation remains intact or is protected in all other areas of the site

b) the duration of exposure is minimised by undertaking works so that:

- *clearing of vegetation is only undertaken immediately prior to an area being actively worked*
- *the work is staged to minimise the area of soil exposed at any one time*
- *if clearing is undertaken in areas which are not intended to be immediately worked, such areas are **effectively stabilised**[6] immediately following clearing*
- *areas at finished level are **effectively stabilised***
- *steep areas, such as stockpiles, batters and embankments, which are not being actively worked, are **effectively stabilised**.*

Cleared areas, where the soil is left exposed, pose a high risk of causing water contamination from rainfall and run-off. **It is the responsibility of those who create the risk to manage that risk**. This could include any or all parties involved in the development.

Clearing of vegetation should be restricted to the construction areas, designated vehicle access area, site shed and storage areas. Other areas should be identified as 'no go' areas and the vegetation left intact and protected from vehicular traffic. Areas at 'finished level' should receive permanent stabilisation as soon as

[6] **Effectively stabilised** means a surface that does not have visible evidence of soil loss (including subsoil) caused by sheet, rill or gully erosion, or lead to sedimentation or water contamination.

possible after reaching finished level.

In cleared areas which are not being actively worked, minimising the risk caused by vegetation removal is usually achieved most effectively by applying a temporary erosion control. Stabilisation is most effectively achieved by: covering the soil with 'sacrificial' mulch, hydro mulch, spray on soil binders[7], turf, or a reusable cover such as geotextile, to prevent the erosion caused by raindrop impact; and by implementing surface water flow controls (such as clean water diversion drains up slope; and dirty water surface drains down slope). In areas where surface water flows concentrate, lining of flow paths with an appropriate material may be required to prevent erosion.

Erosion and sediment controls including soil stabilisation measures, should be site specific, based on physical features and risks relevant to the site.

Stabilisation methods:

- should not result in water contamination. For example, bark mulch should not be used in concentrated flow paths because it is likely to be washed away
- for areas at finished levels need to provide effective stabilisation for the short, medium, and long term
- for revegetation areas - need to consider soil testing, amelioration and preparation to provide optimal conditions for plant establishment.

Drainage control

a) *Do all areas of the site subject to concentrated stormwater flows (including both clean and dirty stormwater) have concentrated flow paths, including drainage lines, diversion drains, channels and batter chutes which have been designed, constructed and maintained to convey flows for all rain events up to and including the below standards[1]*#?*

Temporary drainage structure	Anticipated design life		
	<12 months	12-24 months	>24 months
Drainage structures [2]	1 in 2-year ARI / 39% AEP	1 in 5-year ARI / 18% AEP	1 in 10-year ARI / 10% AEP
Drainage structures (e.g. *Catch Drain, Flow Diversion Bank)* located immediately up-slope of an occupied property that would be adversely affected by the failure or overtopping of the structure [2] [3]	1 in 10-year ARI / 10% AEP		
Culvert crossing	Minimum 1 in 1-year ARI (63% AEP) hydraulic capacity wherever reasonable and practicable.		

Notes: [1] Modified from Table 4.3.1 of International Erosion Control Association (IECA) (2008) Best Practice Soil and Erosion Control. Used with permission.
[2] Design capacity excludes minimum 150 mm freeboard.
[3] Design flow rate based on up-slope drainage structures operating in accordance with their design capacity excluding freeboard, i.e. any constructed freeboard is assumed to have been washed away or otherwise deactivated.

without causing:

- *water contamination*
- *sheet, rill or gully erosion*
- *sedimentation.*

[7] Things to consider when using soil binders or soil stabilisers: Check with the supplier or manufacturer that the product can be planted over, is safe to use in residential areas, and is not toxic or harmful to plants, animals, and waterways. Spray-on binders can be difficult to see on the ground unless a coloured dye is added. Talk to your supplier about options; and products may need to be reapplied after a certain time. Check with your supplier about expected product life.

- *damage to structures or property.*

** as per table 4.3.1 Drainage Design standard for temporary drainage works of the document: 'Best Practice Erosion and Sediment Control' (IECA, 2008) or latest equivalent*
 # information on the use of rainfall probability terminology (AEP and ARI) is available from the Bureau of Meteorology website.

The 10-year average recurrence interval[8] (ARI) structural stability objective for drainage structures is based on the need to protect water quality from a catchment perspective. The structural stability requirements are intended to mitigate the potential cumulative impacts from sequential failures that may be caused by more frequent rain events in catchments undergoing significant urban development.

Construction sites are likely be subject to a less frequent larger storm event (e.g. 10-year ARI). When drainage structures are only designed to cater for smaller, more frequent events, and are subjected to events such as 10-year ARI event, the structures are likely to fail. Failure of drainage structures can affect the functionality of other erosion and sediment controls, which can increase the likelihood of contaminants being released to the environment.

It is important that stormwater releases do not cause erosion. The releases must occur via energy dissipation devices or other control structures to reduce velocity and erosive potential of the flows.

b) Is clean stormwater diverted around or through the site?

An example of where clean stormwater diversions may not be needed is a site with no upslope catchment i.e. on the crest of a hill.

c) If clean stormwater is diverted around or through the site, it does not cause:
- *an increase in the concentrations of any contaminants in the clean stormwater flows*
- *erosion (on-site and/or off-site)*.

Uncontrolled run-on from up slope adds to the volume of stormwater to be managed on-site and a corresponding increase in the size of the sediment basin(s) required. If possible, clean stormwater should be diverted around or through the site and released in such a way that does not cause erosion, water contamination, flooding or damage to structures.

d) If clean stormwater has not been diverted around or through the site, have treatment devices been sized to accommodate the additional volume of run-off?
e) Are flows from the upslope catchment conveyed down steep slopes without causing erosion, for example via a stable drain, chute, flume or pipe?
f) Have drainage controls been installed to manage sheet flows of stormwater such that rill erosion is prevented or minimised?

Drainage is required to intercept flows at regular intervals down slopes to prevent sheet flows concentrating and causing rill erosion. In areas that have not been actively worked controls should be in place to prevent concentrating sheet flows and generating erosion issues. In active work areas, best practice erosion and sediment controls should be installed prior to rainfall or at the end of each day when rainfall is forecast (e.g. Bureau of Meteorology predicts more than 30 per cent probability of rainfall for relevant forecast district).

Uncontrolled sheet flows can cause erosion as the velocity of the flow increases. Stabilisation of areas not subjected to concentrated flows can usually be achieved with a protective layer such as vegetation, mulch or geotextile or soil binder. Sediment barriers such as sediment fences provide a secondary protection, but are usually insufficient to use without erosion controls, because they do not control suspended sediment. 'Effective

[8] The average or expected value of the periods between exceedances of a given rainfall total accumulated over a given duration.

slope length' should be reduced using banks, bunds, drains or batter steps constructed parallel to the contour and at intervals sufficient to keep flows at non-erosive velocities.

Sediment Control

a) *Do all site sub-catchments with greater than 2500m^2 of exposed soil drain to an appropriate sediment control device (e.g. sediment basins and including associated drainage controls), which is designed, implemented and maintained to a standard which would achieve at least 80 per cent of the average annual run-off volume of the contributing catchment treated to 50mg/L Total Suspended Solids (TSS) or less?*
b) *Does the sediment control have the capacity to store two months' sediment from the receiving catchment, as determined using the Revised Universal Soil Loss Equation (RUSLE)?*

The revised sediment control standard has been developed in response to the low effectiveness of traditional batch sediment basins which were implemented in accordance with the previous standard. The department funded both the investigation and development of the above revised standard by IECA and the update to IECA (2008) to incorporate design procedures for more effective continuous-flow (or high efficiency) sediment basins capable of meeting this standard.

There are a range of available technologies and approaches which may be utilised and are accepted as achieving compliance with this design objective. They are as follows:

- Install and operate Type-A or Type-B sediment basins designed in accordance with IECA (2016 addendum, in publication). Type-A basins incorporate a floating decant as the primary outlet while Type-B basins can remain full between events and have only a spillway outlet.
- Install and operate batch sediment basins which have both the settling zone storage volume and dewatering time modified from the parameters provided in IECA (2008) for Type-D sediment basins.

  Examples of modified batch basin parameters which meet these criteria are as follows:

  - Locations west of the Great-Dividing Range and Ipswich: settling zone storage sized as 500m^3 per Ha of contributing catchment and dewatering prior to any storm event that is likely to produce run-off.
  - Caloundra: settling zone storage sized to capture 1-year ARI event of 24 hour duration and dewatering occurs within two days of rainfall ceasing.
  - Cairns: settling zone storage sized to capture 5-year ARI event of 24 hour duration and dewatering occurs within two days of rainfall ceasing.
  - For other locations the sizing will need to be documented on the ESC plan and provided with supporting justification/calculations.
- Alternative measures may be implemented where it can be shown through long-term water-balance modelling that the measures will achieve the release criteria of 50mg/L TSS for at least 80 per cent of the average annual run-off volume. This would need to be documented and justified in the ESC Plan.
- Effective erosion control can be implemented in lieu of requiring sediment controls specified above. For small areas which are unable to drain to a basin, this could be achieved by implementing contingency measures prior to rainfall, such as covering exposed soil with blankets (mulch or synthetic) or spray on soil binders. In these circumstances the erosion controls must result in an **effectively stabilised** surface to justify the exclusion of sediment controls.

Methods for determining whether the sediment control has been implemented to meet this design standard in the field will depend on which type of control has been implemented as follows:

- Type-A Basins: The discharge from the basin is required to meet the release criteria (i.e. <50mg/L TSS) for all rainfall event totals up to the 1-year ARI 24 hour duration event for the location. This can be

calculated for any location from Intensity-Frequency-Duration (IFD) data obtained from the Bureau of Meteorology website.

- Type-B Basins: The discharge from the basin is required to meet the release criteria (i.e. <50mg/L TSS) for all rainfall event totals up to the 1-year ARI 24 hour duration event for the location. The exception to this is short, high-intensity rainfall 'bursts' where the lack of ephemeral storage in this type of basin could cause the release criteria to be temporarily exceeded. Where basin catchments are small (<2Ha) and have short times of concentration, this exceedance is not expected to last for longer than 30 minutes. If high-intensity rainfall is being experienced at the time of inspection, compliance officers should wait until the rainfall burst has subsided and lower intensity rainfall is occurring before sampling the release for compliance purposes.
- Batch Basins: Uncontrolled releases from these basins (i.e. flow over the spillway) should not occur for rainfall event totals up to the specific design event (mm). This will vary by location and reference may need to be had to the ESC plan, but in all locations, this will be required to be at least equivalent to the event total for the 1-year ARI 24 hour duration event for the location.

Based on the above, checking compliance based on **the preceding rainfall being less than the 1-year ARI 24 hour duration rainfall total (mm) for the location** would be a conservative approach regardless of the technology used. As noted above, at many locations the sediment controls should exceed this standard, so it is achievable and will still result in triple the amount of run-off treated compared to the previous design standard.

c) Are sediment basins and associated structures such as inlets, outlets and spillways structurally sound and in accordance with the requirements of the ESC plans?

Sediment basin inlets, outlets and embankments should be structurally designed and constructed to be capable of withstanding the flows for the minimum design storm event for the design life of the structure[9]:

Design Life	Minimum design storm ARI / AEP[10]
Less than 3 months operation	1 in 10-year ARI / 10% AEP
3 to 12 months operation	1 in 20-year ARI / 5% AEP
Greater than 12 months operation	1 in 50-year ARI / 2% AEP
If failure is expected to result in loss of life	Probable maximum flood

It is the responsibility of the designer to correctly identify and clearly state the design ARI/AEP selected for all structures based on an analysis of the consequences of failure. Reference should be made to the Healthy Waterways Water Sensitive Urban Design (WSUD) Guidelines and Queensland Urban Drainage Manual (QUDM) for criteria related to property protection and human safety that are applicable to spillways, basin embankments and freeboards.

Is the basin a batch treatment basin (Type D)? If so:

d) Are sediment basins maintained with sufficient storage capacity to capture and treat the run-off from the design rainfall event?

e) *Are sediment basins dewatered as soon as practicable following rainfall events?*

For Type D, batch sediment basins, dewatering needs to occur as soon as practicable following a rainfall event once the release criteria of 50mg/L TSS has been reached. If captured water is intended to be reused, say for

[9] as per Table B12 Recommended design standard for emergency spillways on temporary Sediment basins of International Erosion Control Association of Australasia (IECA) Best Practice Erosion and Sediment Control, 2008).
[10] information on the use of rainfall probability terminology (AEP and ARI) is available from the Bureau of Meteorology website.

example for dust suppression or road construction, the basin needs to be over-sized to accommodate the additional capacity.

f)	*Is accumulated sediment from sediment basins and other controls removed and disposed of properly?*

Sediment basin design usually allows for a two month accumulated sediment capture to be stored in the sediment basin. It is important that this volume is not exceeded because that causes a corresponding reduction in the basin's stormwater capture capacity. When sediment is removed from a sediment basin, it should be disposed of appropriately without causing, or potentially causing, water contamination.

g)	*For batch (Type-D) basins: Does the concentration of total suspended solids released from sediment basins as a result of dewatering exceed 50 mg/L?*
h)	*For Type-A and Type-B basins: Does the concentration of total suspended solids released from sediment basins for events up to the design rainfall event exceed 50 mg/L?*

Type A and B basins have the advantage for site construction of having a portion of water which is retained within the basin at the end of the rainfall event which does not have to be manually dewatered. This retained water is available for site purposes such as dust suppression, rather than having to dewater the design storage volume as soon as possible after each rainfall event (once the discharge quality level is reached <50mg/L TSS).

The release criteria for sediment basins of 50mg/L TSS cannot be determined in the field and samples will need to be collected for laboratory analysis where a breach of the release criteria is suspected. Samples should be collected in accordance with the department's Monitoring and Sampling Manual 2018[11]. Where equipment is available to test for turbidity in the field (i.e. either a turbidity tube or turbidity meter) than any reading below 60 NTU would generally indicate sampling for laboratory analysis is not required.

i)	*For disturbed site areas less than 2500m^2 which cannot feasibly drain to a sediment basin, are compensatory erosion and sediment controls implemented to minimise erosion and maximise sediment capture?*

Compensatory ESC are erosion, flow and sediment controls which compensate for the lack of sediment basins and are applied so that the type, timing, placement and management of controls minimise the potential for water contamination and environmental harm. This is primarily achieved by reducing the risk of erosion and subsequent sediment release, for example by stabilising concentrated flow paths and stabilising exposed areas with an effective surface cover such as mulch, hydro mulch, spray on soil binders or turf.

j)	*For disturbed areas which do not drain to a sediment basin and which are not provided with compensatory drainage and sediment controls, are contingency measures available on site, which can be deployed to such areas, prior to rain, to minimise erosion and maximise sediment capture and/or implement the designed control measures?*

Contingencies for areas being actively worked should include the rapid deployment of cut off or diversion drains, sediment controls and surface cover.

[11] Refer to current version available on the department's website.

Risk management

It is acknowledged that erosion and sediment controls perform no function in dry weather and that some operators may choose to take a risk management approach to implementing some erosion and sediment controls. For example, in a bulk earthworks phase, a contractor may decide that a dirty water diversion drain shown on the ESC plan impedes the movement of machinery. Subsequently, they may elect not to construct the diversion drain until rain is forecast, on the basis that the drain can be quickly constructed and lined, and the required machinery and material are on hand. The operator assumes responsibility for this action and is responsible for releases that occur in the event of an unpredicted rain event or a forecast rain event for which the contractor is unable to install the drain in time.

Conversely, major ESC, such as sediment basins, should be constructed at the beginning of the project and remain in place until the site is fully and **effectively stabilised** due to the significant risk posed by not incorporating such measures.

*k) Are sediment controls applied to effectively capture sediment eroded from steep areas, such as stockpiles, batters and embankments, which are currently being worked or not **effectively stabilised**, for example a sediment fence immediately down slope of such steep areas?*

It is incumbent on the operator to manage stockpiles, batters and embankments actively being worked so that in the event of rain, there is no impact on receiving waters. It is important to protect stockpiles, batters and embankments from erosion because:

- it is part of a 'treatment train' approach, which seeks to minimise erosion in the first place
- through the process of erosion by stormwater, soil is usually separated into its constituent parts, which in terms of ESC are:
    - coarse and medium sediment—unless captured on-site it is likely to cause sedimentation off-site. If captured it needs to be disposed of appropriately
    - fine sediment—will usually become suspended in stormwater flows and unless captured and removed from released stormwater, is likely to impact on receiving waters. Once captured it needs to be disposed of appropriately
    - topsoil—greatly assists in the timely re-establishment of vegetation, which can significantly reduce the duration of soil exposure and the consequent potential for water contamination.

l) Have controls been implemented to prevent or minimise sediment from leaving the site on the tyres of vehicles?

Sediment deposited on roads from vehicles exiting a construction site is likely to constitute a breach of s.440ZG. From the roadway it is highly likely to enter the (unprotected) stormwater system during a subsequent rain event. Sediment deposited on a roadway may also be a pedestrian or traffic hazard.

Disturbances in waterways

If works or other disturbances in waterways are planned or have occurred:

a) If required, does prior written approval from the relevant consent authority exist? For example, permits under the Planning Act 2016, Coastal Protection and Management Act 1995, Vegetation Management Act 1999, Water Act 2000 (Water Act)?
b) Where approval is not necessary for certain entities under the Water Act, has reference been made to the Guideline—Activities in watercourse, lake or spring carried out by an entity?
c) Has the work been:

- *scheduled to occur during dry weather?*
- *done expeditiously?*
- *done in accordance with a current best practice environmental management guideline?*

If temporary vehicle waterway crossings are required to construct the approved works, has the number of temporary vehicular crossings been minimised?

Construction work in waterways can have devastating effects on stream health. Planning for works in waterways should include consideration of alternatives such as tunnel boring instead of trenching. Work within waterways should be planned and executed so that minimal erosion, sedimentation and turbidity results. This can be achieved by scheduling works to occur during low flow or no flow seasons. At the completion of works, the waterway should be rehabilitated to pre-existing conditions. Temporary vehicular crossings through creeks and drainage lines should be designed to remain stable in the 10-year ARI/ 10 per cent AEP event of critical duration. When carrying out channel or bridging works install a temporary stream bypass channel where practical. Consider the upstream catchment size in the design of causeways.

Monitoring and adaptive management

a) Is there an effective monitoring and assessment program implemented on-site to identify, measure, record and report on the effectiveness of the erosion and sediment controls and the lawfulness of releases?

A water quality monitoring program should be implemented by those responsible for the site. The program should monitor all event-based releases from the site including controlled releases and releases caused by rain events.

b) Are non-compliances reported to the administering authority within 24 hours in accordance with Duty of notify of environmental harm provisions of the Environmental Protection Act 1994 s320-s320G?
c) Have additional measures been implemented to achieve compliance when non-compliances have been detected?

Typical erosion and sediment controls may produce different results on different sites, due to variations in soils, rainfall and slope. In satisfying their legal requirements, those responsible for the site need to ensure that releases meet the release criteria, or where the release criteria are exceeded, that all environmental performance standards have been met. This includes reviewing monitoring data and where exceedances are found, implementing additional and or alternative erosion and sediment controls to achieve the environmental outcomes.

Appendix 2: Checklist: Standard work method for the assessment of the lawfulness of releases to waters from land development and construction sites 2500m2 and greater

This document has been prepared to provide officers authorised under *the Environmental Protection Act 1994* (EP Act) with an assessment tool for undertaking Erosion and Sediment Control Practices (ESC) compliance inspections at land development sites in Queensland, and guidance to apply enforcement provisions under the EP Act.

PART A —Assessment of actual or potential water contamination		
1)	Has the activity caused or does it have the potential to cause sediment build up, through act or omission, in the receiving environment?	Y ☐ N ☐
2)	Has the activity caused or does it have the potential to cause releases, flows or discharges containing prescribed water contaminants to waters, roadside gutters or stormwater drainage?	Y ☐ N ☐
(If the answer to either 1 or 2 is 'yes', proceed to Part B). *(If both answers are 'no', no further action is required at this time).*		
PART B - Assessing the lawfulness of depositing prescribed water contaminants or release of stormwater run-off		
1)	Is the release of the prescribed contaminant(s) and/or the build-up of sediment expressly permitted by a development condition of a relevant approval under section 493A? *(If the answer is 'yes', no further action is required at this time. If the answer is 'no', proceed to question (2))*	Y ☐ N ☐
2)	Use the following questions to assess compliance with the general environmental duty (GED).	
Erosion and Sediment Control Programs or Plan(s)		
	Does a site-specific erosion and sediment control plan(s) or program exist?	Y ☐ N ☐
	Do the plan(s) for each phase of the works (including clearing, earthworks, civil construction, services installation and landscaping) detail the type, location, sequence and timing of measures and actions to effectively minimise erosion, manage flows and capture sediment?	Y ☐ N ☐
	Are the programs or plan(s) consistent with current best practice standards, taking into account all environmental constraints including erosion hazard, season, climate, soil, and proximity to waterways?	Y ☐ N ☐
	Do the plan(s) address all the relevant issues described in Part 2.2?	Y ☐ N ☐
	Have the ESC plan(s) been prepared by a suitably qualified professional?	Y ☐ N ☐
	Have the ESC plan(s) been modified as necessary to address the changing physical conditions of the site?	Y ☐ N ☐ NA ☐
	Erosion control	
	Is non-essential exposure of soil avoided in terms of:	
	(a) The extent of clearing is restricted to that necessary for access to, and safe construction of the approved works. Vegetation remains intact/is protected in all other areas of the site?	Y ☐ N ☐
	(b) The duration of exposure is minimised, such that:	
	• clearing of vegetation is only undertaken immediately prior to an area being actively worked	Y ☐ N ☐
	• the work is staged to minimise the area of soil exposed at any one time	Y ☐ N ☐
	• if clearing is undertaken in areas which are not intended to be immediately worked, such areas are effectively stabilised[12] immediately following clearing	Y ☐ N ☐

[12] In this document, an effectively stabilised surface is defined as one that does not:

<table>
<tr><td></td><td>

- areas at finished level are effectively stabilised

</td><td>Y ☐ N ☐</td></tr>
<tr><td></td><td>

- steep areas, such as stockpiles, batters and embankments, which are not being actively worked, are effectively stabilised.

</td><td>Y ☐ N ☐</td></tr>
<tr><td></td><td colspan="2">Drainage control</td></tr>
<tr><td></td><td>
Do all areas of the site subject to concentrated stormwater flows (including both clean and dirty stormwater) have concentrated flow paths, including drainage lines, diversion drains, channels and batter chutes which have been designed, constructed and maintained to convey flows for all rain events up to and including[1*#]:
<table>
<tr><th rowspan="2">Temporary Drainage structure</th><th colspan="3">Anticipated design life#</th></tr>
<tr><th><12 months</th><th>12-24 months</th><th>>24 months</th></tr>
<tr><td>Drainage structures [2]</td><td>1 in 2-year ARI / 39% AEP</td><td>1 in 5-year ARI / 18% AEP</td><td>1 in 10-year ARI / 10% AEP</td></tr>
<tr><td>Drainage structures (e.g. Catch Drain, Flow Diversion Bank) located immediately up-slope of an occupied property that would be adversely affected by the failure or overtopping of the structure [2] [3]</td><td colspan="3">1 in 10 year ARI / 10% AEP</td></tr>
<tr><td>Culvert crossing</td><td colspan="3">Minimum 1 in 1-year ARI (63% AEP) hydraulic capacity wherever reasonable and practicable.</td></tr>
</table>
Notes:
[1] Modified from Table 4.3.1 of International Erosion Control Association (IECA) (2008) Best Practice Soil and Erosion Control. Used with permission.
[2] Design capacity excludes minimum 150 mm freeboard.
[3] Design flow rate based on up-slope drainage structures operating in accordance with their design capacity excluding freeboard, i.e. any constructed freeboard is assumed to have been washed away or otherwise deactivated
without causing:

water contamination
sheet, rill or gully erosion
sedimentation
damage to structures or property.

* as per table 4.3.1 Drainage Design standard for temporary drainage works of the document: 'Best Practice Erosion and Sediment Control' (IECA, 2008) or latest equivalent.
# information on the use of rainfall probability terminology (AEP and ARI) is available from the Bureau of Meteorology website.
</td><td>Y ☐ N ☐</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td>Is clean stormwater diverted around or through the site?</td><td>Y ☐ N ☐</td></tr>
<tr><td></td><td>If clean stormwater is diverted around or through the site, it does not cause:
an increase in the concentrations of any contaminants in the clean stormwater flows?
erosion (on site and/or off site)?</td><td>Y ☐ N ☐</td></tr>
<tr><td></td><td></td><td>Y ☐ N ☐</td></tr>
<tr><td></td><td>If stormwater has not been diverted around or through the site, have sediment basins been sized to accommodate the additional volume of run-off? (See section 2.2.3)</td><td>Y ☐ N ☐</td></tr>
<tr><td></td><td>Are flows from the upslope catchment conveyed down steep slopes without causing erosion for example via a stable drain, chute, flume or pipe?</td><td>Y ☐ N ☐</td></tr>
<tr><td></td><td>Have drainage controls been installed to manage sheet flows of stormwater such that rill erosion is prevented or minimised?</td><td>Y ☐ N ☐</td></tr>
<tr><td></td><td colspan="2">Sediment Control</td></tr>
<tr><td></td><td>(a) Do all site sub-catchments with greater than 2500m^2 of exposed soil drain to a sediment basin or equivalent sediment control (including associated drainage controls) which is designed, implemented and maintained to a standard which would achieve at least 80 per cent of the average annual run-off volume of the contributing catchment treated to 50mg/L Total suspended solids (TSS) or less</td><td>Y ☐ N ☐</td></tr>
</table>

- have visible evidence of soil loss caused by sheet, rill or gully erosion
- lead to sedimentation
- lead to water contamination.

	(b) Does the sediment control have the capacity to store two months of sediment from the receiving catchment, as determined using the Revised Universal Soil Loss Equation?	Y ☐ N ☐
	Are sediment basins and associated structures such as inlets, outlets and spillways structurally sound and in accordance with the requirements of the ESC plans?	Y ☐ N ☐
	Is the basin a batch treatment basin (Type D)? If so: - are sediment basins maintained with sufficient storage capacity to capture and treat the run-off from the design rainfall event? - are sediment basins dewatered as soon as practicable following rainfall events?	Y ☐ N ☐ Y ☐ N ☐
	Are accumulated sediment from sediment basins and other controls removed and disposed of properly?	Y ☐ N ☐
	For **Type-D** basins: Does the concentration of total suspended solids released from sediment basins as a result of dewatering exceed 50 mg/L? For **Type-A** and **Type-B** basins: Does the concentration of total suspended solids released from sediment basins for events up to the design rainfall event exceed 50 mg/L?	Y ☐ N ☐ Y ☐ N ☐
	For disturbed site areas less than 2500m^2 which cannot feasibly drain to a sediment basin, are compensatory erosion and sediment controls implemented to minimise erosion and maximise sediment capture?	Y ☐ N ☐
	For disturbed areas which do not drain to a sediment basin and which are not provided with compensatory drainage and sediment controls, are contingency measures available on site, which can be deployed to such areas, prior to rain, to minimise erosion and maximise sediment capture and/or implement the designed control measures?	Y ☐ N ☐
	Are sediment controls applied to effectively capture sediment eroded from steep areas, such as stockpiles, batters and embankments, which are currently being worked?	Y ☐ N ☐
	Have controls been implemented to prevent or minimise sediment from leaving the site on the tyres of vehicles?	Y ☐ N ☐
	Disturbances in waterways ***(If not applicable, go to 2.5)***	
	If works or other disturbances in waterways are planned or have occurred,	
	does prior written approval from the relevant consent authority exist if required (for example permits under the *Planning Act 2016*, *Coastal Protection and Management Act 1995, Vegetation Management Act 1999, Water Act 2000* etc.)?	Y ☐ N ☐
	Where approval is not necessary for certain entities under the *Water Act 2000*, has reference been made to Guideline—Activities in watercourse, lake or spring carried out by an entity?	Y ☐ N ☐
	Are temporary flow diversions in place?	Y ☐ N ☐
	Has the work been - scheduled to occur during dry weather?	Y ☐ N ☐
	- done expeditiously?	Y ☐ N ☐
	- done in accordance with a current best practice environmental management guideline?	Y ☐ N ☐
	If temporary vehicle waterway crossings are required to construct the approved works, has the number of temporary vehicular crossings been minimised?	Y ☐ N ☐
	Monitoring and adaptive management	
	Is there an effective monitoring program that measures and records the quality of all releases, flows and discharges from the activity to waters, roadside gutters and stormwater drainage?	Y ☐ N ☐
	Are non-compliances reported to the administering authority within 48 hours?	Y ☐ N ☐
	Have additional measures been implemented to achieve compliance when non-compliances have been detected?	Y ☐ N ☐

PART C – Compliance and enforcement considerations and responses

The department has a wide range of enforcement measures available for managing compliance with the legislation it administers. Enforcement measures include:

- verbal warnings and warning letters in response to breaches of legislation[13]
- penalty infringement notices (PIN)
- administrative actions
- civil proceedings for court orders
- enforceable undertakings
- prosecution.

Authorised officers are required to exercise discretion when making compliance and enforcement decisions. Refer to the *Enforcement Guidelines (Department of Environment and Heritage Protection, 2016)* for additional information and guidance.

A flow chart in Appendix 3 has been developed to guide the compliance and enforcement considerations and response for offences under s.440ZG.

Key enforcement considerations

Liability

Determining who is liable for an offence is critical to ensure compliance and enforcement actions are successful. Due to the nature of construction and development practices and the numbers of different sub-contractors and deliveries which can occur, it can be difficult to identify the party who is directly responsible for a deposit or release unless an act is directly observed by the authorised officer.

The EP Act (s.440ZE) makes provision for the occupier of a place (e.g. the builder who has possession of the building site) to be liable for an unlawful deposit of earth or contaminants caused by another person, if they do not remove the contaminant or stop the earth being exposed at the place within a reasonable timeframe after becoming aware of the deposit or release. An occupier's liability for another person's actions is limited to the 'place' of deposit which does not include waters ((s.440ZE (5)).

If an offence is observed (for example a stockpile is present on the site and is not covered and is not protected with a down-slope sediment fence) but it is unclear whether this has been committed by a sub-contractor or the occupier. It would not be appropriate to take action by way of a PIN to the occupier without first bringing the issue to their attention, allowing them time to rectify and determining:

a) who has committed the deposit or release?
b) who is responsible for the site?
c) when did they become aware of the deposit or potential release?

The following two scenarios illustrate some issues that may arise in relation to identifying the party directly responsible for a deposit or release.

[13] Refer to the *Procedural Guide Strategic Compliance Warnings* (ESR/2016/2318) for further information.

Scenario 1: Occupier present

The occupier or person undertaking building works **is** present on site, and:

a) All controls are in place
b) All the controls are not in place, but:
    i. no actual release or deposit to the stormwater system has occurred
    ii. the controls have either been temporarily removed for site access or the deficiencies can be easily reinstated prior to rainfall and prior to the end of the days works.

In situations where the answer is 'yes' to either of the above then no compliance action should be taken. However, to encourage a culture of best practice by the building and construction industry a recognition may be given through acknowledging good practice in post inspection letters.

Where the answer is "no' then there may be sufficient grounds to demonstrate that the occupier (represented by the site supervisor) was aware of the issues and is therefore responsible for the *deposit.* A request to rectify before close of business would be made.

Scenario 2: Occupier not present

The occupier or person undertaking building works **is not** present on site and;

a) not all controls are in place
b) all the controls are in place, and:
    i. actual release or deposit to the stormwater system has occurred
    ii. the controls have been temporarily removed and cannot be easily reinstated prior to rainfall and prior to the end of the days works.

In this situation it is necessary to bring the issue/offence to the attention of the occupier (e.g. builder) and allow them reasonable time to rectify before they can be held accountable for the deposit under s.440ZE.

It is recommended that in these situations the occupier (as identified by the signage on site and any follow-up enquiries with the relevant local government) is given a warning directly by telephone or via email identifying that a prescribed water contaminant has been deposited on the site or the potential for release exists. A period of up to 24 hours is considered appropriate for the occupier to notify the authorised officer the rectification is complete.

In the absence of confirmation, further action will be taken.

Evidence Gathering

When investigating a s.440ZG offence, it is important to obtain evidence that is capable of establishing, beyond reasonable doubt, that the contaminant could reasonably be expected to wash, blow, fall or otherwise move into waters, a roadside gutter or stormwater drainage. It is important to gather evidence that clearly demonstrates the proximity of the contaminant to the waterway, or a statement that addresses the issue in a detailed way including measured distances, gradient of the land etc.

Further information

For copies of supporting information please visit www.des.qld.gov.au.

Disclaimer

While this document has been prepared with care it contains general information and does not profess to offer legal, professional or commercial advice. The Queensland Government accepts no liability for any external decisions or actions taken on the basis of this document. Persons external to the Department of Environment and Science should satisfy themselves independently and by consulting their own professional advisors before embarking on any proposed course of action.

Appendix 3: Flow chart: General compliance and enforcement considerations and response for land development/construction sites 2500m^2 and greater