



# Erosion and Sediment Control Plans For Rural Development

## Description

Erosion and Sediment Control Plans (ESCPs) set out erosion and sediment control works for land development, such as subdivision or clearing of native vegetation. An ESCP is a standardised schematic plan based on the development site, showing the location and technical specifications for all proposed erosion or sediment controls.

## Why Have an ESCP?

**Asset Protection:** disturbing vegetation and soils creates an erosion risk which, if not addressed, can lead to disruption of development works, increased costs and delayed completion dates. Uncontrolled erosion can cause damaged infrastructure, extra maintenance costs, reduced agricultural productivity or loss of property market appeal.

**Planning & control:** an ESCP enables landholders, developers and contractors to strategically plan erosion and sediment controls necessary to reduce the risk of erosion and sediment discharge during all phases of a development. Forward planning facilitates integration of erosion and sediment control (ESC) and other site works, assists cost control and supports contract management.

**Approval:** an ESCP provides landowners, developers and the approving authority with a detailed and comprehensible plan of all proposed ESC works for the development. A clear and concise plan facilitates processing of applications and implementation.

**Implementation:** an ESCP should be usable in the field as an instruction manual for contractors, providing clear directions and quick reference to methodology or standard drawings of erosion and sediment control structures. An ESCP clarifies roles and responsibilities for consultants, site managers and contractors.

## Compliance

Compliance with an approved ESCP is often cited as a condition on a **Development Permit**, e.g. *“Preparation and subsequent implementation of an approved Erosion and Sediment Control Plan, to the satisfaction of the consent authority ...”*

The consent authority may also require the preparation of a preliminary ESCP prior to determination of a development application, especially where there is significant erosion risk.

An approved ESCP is required to be implemented on the ground with final ‘sign off’ not being provided until ESCP works have been completed and the site stabilised.

During the implementation of the ESCP, unexpected circumstances or large storm events may necessitate amendment of the ESCP. This should always be done in consultation with the approving authority.

## Format

An ESCP can be presented as one or more plans and diagrams, similar to technical drawings or building plans, showing the development site with the location of all temporary and permanent erosion controls identified and adequately labelled.

ESCPs for rural subdivision and vegetation clearing generally have a different focus than those used for urban and civil construction sites. See Department of Land Resource Management (DLRM) Fact Sheet **Model Erosion and Sediment Control Plans For Rural Development** which provides an example ESCP for vegetation clearing and agricultural development.

The plan should be accompanied by standard specifications (i.e. drawings of the erosion and sediment control structures), technical notes and a timeline of proposed works, including site rehabilitation and revegetation.

A comprehensive ESCP document is often not necessary and information can be presented on a side bar or within the site map frame where adequate space is available. Additional text or diagrams can be provided as attachments if required.

## Content

ESCP content will depend on the type of development and the appropriate erosion and sediment control (ESC) works. These should include all proposed earthworks, structures and methods or treatments (including revegetation), for both the construction (development works) and operational (post-construction) phases.

**1. Timing & Staging:** programme timelines to ensure ESC measures are implemented prior to other development work on site. To limit the extent and duration of soil exposure, stage development so that land disturbance is confined to areas of manageable size, and plan for progressive

application of ESC works as each stage is implemented.

Schedule major earthmoving and land disturbance activities to take place during the Dry season, staged for completion by 30<sup>th</sup> September. Avoid works in the Wet season, which require more extensive ESC measures and have high maintenance demands.

**2. Vegetation management:** plan for minimum disturbance to retain or preserve as much of the existing vegetation as possible, especially adjacent to drainage lines. Consult the DLRM **Land Clearing Guidelines (2010)** for information on required buffer zones. Areas of native vegetation not required to be cleared should be identified in the ESCP, and flagged on the ground as NO-GO areas.

Identify any areas to be used as 'turn around' or laydown areas in the ESCP, and indicate in the **Construction Notes** how cleared and NO-GO areas will be implemented e.g. GPS data provided to clearing contractors and areas flagged on the ground prior to any clearing activity.

Provide notes on methods and timing of clearing with an emphasis on avoiding or minimising formation of flow paths (e.g. placement of slash piles or wheel ruts) that can concentrate surface runoff and create potential for erosion.

**3. Surface water & Drainage control:** plan ESC works to control the potential build up of volume and velocity of surface water flows, and to limit the formation of concentrated flows.

In broad acre situations this often involves interception of surface flows with graded banks or diversion banks (see DLRM Fact Sheet **Model Erosion and Sediment Control Plans For Rural Development**).

With subdivision development consider surface flows entering the site from undisturbed areas upslope ('clean' water), and storm runoff arising from disturbed areas ('dirty' water). Diversion of upslope runoff around soil disturbances and unstable slopes will avoid or minimise soil erosion, and prevent 'clean water' adding to the volume of 'dirty water' to be managed.

**4. Erosion Control & Surface Stabilisation:** plan ESC measures (e.g. regrassing, mulching, gravel or rock lining, etc.) to protect soil surfaces to prevent or reduce erosion caused by raindrop impact and storm water flows. Loss of topsoil hampers revegetation and adversely affects the productive and amenity values of the site.

Provide notes on how disturbed areas will be progressively stabilised and/or revegetated as soon as possible following completion of works.

Prompt stabilisation of the site will prevent or limit erosion damage to newly formed earthworks and reduce sediment creation at the source.

**5. Sediment control:** plan ESC works to intercept and retain sediment to prevent it spreading into waterways, wetlands, or neighbouring properties. While the management approach used on civil construction sites employs sediment trapping structures, rural sediment control places more emphasis on buffer strips and vegetation filters.

**6. Revegetation & Rehabilitation:** give details of revegetation for disturbed surfaces, for local climate and soil conditions. Where dryland grass is to be established, specify a cover target of 70% at (development works) contract handover. Ensure that rehabilitation and revegetation are included in the ESCP, and are not deferred to a landscape plan for later implementation.

Note if stripped topsoil will be stockpiled on site for reuse on drain surfaces and other disturbed areas. Ensure that any proposed stockpiles have adequate ESC measures as required. Alternatively, schedule activity so that topsoil stripped from a new stage is immediately respread over a recently completed stage. This will also protect the viability of the seed bank in the soil.

While topsoil will contain native species endemic to the area that will assist revegetation, weed seed spread must also be considered. Provide notes that indicate areas of identified weed infestation to be flagged and avoided, or machinery cleaning processes where this is not possible.

**7. Monitoring and Maintenance:** outline how ESC works will be monitored and maintained, including repair of storm damage, until rehabilitation and revegetation is completed and specified contract handover conditions are met.

Include information on a monitoring schedule and assigned personnel. Indicate ESC materials to be held on site for emergency repair works, and consider including an example of a site monitoring form.

## Checklist Guides

The checklists below provide guidance for compiling an ESCP. These checklists are also used by approving authorities when assessing ESCPs associated with rural subdivision, development and clearing of native vegetation. Some items may not be applicable, depending on site conditions and appropriate ESC works.

## ESCP Checklist - Rural Clearing & Development

Map / Feature	On map	Attached text/drawing
An <b>overview map</b> of entire property showing disturbed areas, previous clearing, proposed clearing, water courses, seasonally wet areas / areas of inundation, rock outcrop, other significant natural resource features etc.		
A <b>map/plan</b> of development site with clearly marked boundaries, <b>and:</b>		
Map title, legend, north arrow, scale, map projection & datum reference		
Source – author & date indicated		
Contacts - names & phone numbers of property owners/contractors/site manager		
Timeframe and/or Staging – commencement & completion dates indicated		
Construction Notes (see below)		
Contour lines – clearly marked		
Clearing areas, dates, methods, NO-GO areas, native vegetation buffers		
Appropriate buffers to watercourses, riparian vegetation, sinkholes, poorly drained areas, break of slope (refer to <b>Land Clearing Guidelines</b> )		
Retained vegetation indicated (native & exotic)		
Protected areas, shade trees, corridors indicated		
Graded banks – location, spacing, dimensions & discharge points		
Diversion banks – location, spacing, dimensions & discharge points		
Constructed waterways - location, spacing, dimensions & discharge points		
Temporary controls – locations, specifications, typical diagrams		
Permanent controls – locations, specifications, typical diagrams		
<b>Maintenance</b>		
Who (individual) has been tasked (and authority) to implement, maintain, inspect, repair and modify controls and strategies to ensure erosion does not occur.		
<b>Monitoring</b>		
Monitoring to be carried out on a regular basis. (Note: it is good practice to monitor erosion and sediment controls regularly throughout the duration of the development, even in periods of dry weather).		
<b>Construction Notes</b>		
Timeline of works – e.g. clearing, windrowing & burning, construction of erosion and sediment control measures, ground preparation, planting, stocking etc.		
Methods of works – i.e. clearing, windrowing, ground preparation (e.g. rip, mound, plough), construction of erosion control measures, planting (including species and rates), cropping practices etc.		
Total area (ha) for each clearing polygon, total current clearing on property (ha), total clearing after development (ha).		
Clearing of vegetation to be restricted to nominated areas.		
All erosion and sediment control measures to be constructed & completed prior to the onset of the wet season i.e. 30 <sup>th</sup> September.		
All NO-GO zones must be flagged or fenced to restrict vehicle access		
Proposed dates for both commencement & completion.		
Any changes to the erosion and sediment control plan shall be submitted to the Authority for approval prior to works commencing.		
All erosion & sediment control measures to be undertaken to satisfaction of the Authority.		
Specifications for TEMPORARY erosion & sediment controls.		
Specifications for PERMANENT erosion & sediment controls.		
Specifications for REHABILITATION and REVEGETATION		
N/A = not applicable		

## ESCP Checklist - Rural Subdivision

Map / Feature	On map	Attached text/drawing
An <b>overview map</b> of entire property showing previous clearing, proposed clearing, water courses, seasonally wet areas, other significant natural features etc.		
A <b>map/plan</b> of development site with clearly marked boundaries, <b>and</b> ; Map title, legend, north arrow, scale, map projection & datum reference		
Source – author & date indicated		
Contacts – names & phone numbers of property owners/contractors/site manager		
Timeframe and/or Staging – commencement & completion dates indicated		
Construction Notes (see below)		
Construction compound detail / location, and erosion and sediment controls		
Site access – location & management		
Contour lines clearly marked – both existing & final		
Soil types & erosion risk		
Nature & extent of earthworks including cut & fill		
Haul roads – location & management		
Soil stockpile areas location & controls		
Temporary & permanent erosion and sediment controls – during & post construction phases		
Standard drawings provided		
Protected/sensitive areas identified - watercourses, wetlands, sinkholes, etc.		
All clearing areas identified, including firebreaks/roads, access points, etc.		
Limit all batter gradients to 1(V):4(H) maximum		
Temporary stormwater drainage & protection measures. Including length of outfall drains		
Permanent stormwater drainage & protection measures. Including length of outfall drains		
Open “V” drains <b>not recommended</b> , use trapezoidal or parabolic profiles		
All disturbed areas to be rehabilitated and surface protected		
Grassing/ground cover - timing, site preparation, species & establishment process, % cover targets		
<b>Temporary Measures</b>		
Coir logs		
Diversion banks		
Filter strips		
Geotextile		
Grassing		
Jute matting/mesh		
Mulch banks		
Retained native vegetation		
Sediment fence		
Sediment basins		
<b>Permanent Measures</b>		
Coir logs		
Diversion banks		
Filter strips		
Geotextile		
Grassing		
Jute matting/mesh		
Retained native vegetation		
Culvert and headwall protection (i.e. stone pitching)		
Sediment basins		

<b>Maintenance</b>		
Who (individual) has been tasked (and authority) to implement, maintain, inspect, repair and modify controls and strategies to ensure erosion does not occur.		
<b>Monitoring</b>		
Monitoring to be carried out on a regular basis. (Note: it is good practice to monitor erosion and sediment controls regularly throughout the duration of the development, even in periods of dry weather).		
<b>Construction Notes</b>		
All erosion and sediment control measures to be installed prior to any site disturbance.		
All NO-GO zones must be flagged or fenced to restrict access.		
Topsoil stripped from construction areas to be stockpiled at nominated site.		
Limit batter gradients to 1(V):4(H) maximum.		
Construct all sediment fences on contour where possible.		
All sediment control structures to be inspected after each rainfall event for damage and effectiveness. Trapped sediment to be removed to a nominated site.		
Divert all 'clean' water runoff away from disturbed soil and into intact native vegetation or stormwater drainage system.		
Complete all final erosion prevention and sediment control measures prior to final subdivision handover.		
Proposed dates for commencement & completion.		
Any changes to the erosion and sediment control plan shall be submitted to the Authority for approval prior to works commencing.		
All erosion and sediment control measures to be undertaken to the satisfaction of the Authority.		
Specifications for (progressive) rehabilitation and revegetation		
N/A = not applicable		
<b>General Considerations</b>		
<ul style="list-style-type: none"> <li>• How disturbed areas will be protected from erosion occurring the construction/development phase.</li> <li>• How sediment-contaminated water will be prevented from leaving the site and entering adjacent waterways or a stormwater drainage system.</li> <li>• Any repair or remedial works required to re-establish previously degraded areas.</li> <li>• The use of sandbags for permanent stormwater or sediment control is <b>not recommended</b> as they eventually deteriorate and contribute additional sediment to stormwater and waterway systems.</li> <li>• Areas of native vegetation not required to be cleared are identified on the plan and flagged on the ground as NO-GO areas, and are inspected/verified prior to any works commencing.</li> <li>• Vegetation should be retained to assist in erosion control and be left undisturbed at handover.</li> <li>• All areas to be cleared or used as "turn around areas" should be identified on clearing plans, provided to clearing contractors, downloaded onto contractors GPS units and flagged on the ground prior to any clearing activities commencing.</li> <li>• Methods and timing of clearing should be undertaken in a manner that minimises potential for erosion and sedimentation (e.g. minimises concentration of flow) and contractors should be instructed on these methods.</li> <li>• Due to the increased seasonal risk of erosion and subsequent sedimentation, clearing and major earthworks should only take place in those areas that can be completed and stabilised prior to the 30th September.</li> </ul>		



## Useful References

**Note :** ESC **construction site** practice largely relates to formation of building pads, vehicle access/roads and permanent drainage. **Rural** ESC practice is more focussed on stabilisation of land post-clearing. While there is overlap between the two approaches, construction site ESC often involves relatively small catchment areas and mainly uses temporary controls, and some techniques may not be adequate or appropriate for broad acre application.

### Erosion & Sediment Control – A Field Guide for Construction Site Managers V5.

*Catchments & Creeks Pty Ltd*



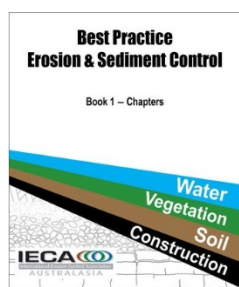
This field guide provides site managers and personnel with guidelines on the management of erosion control and sediment runoff on construction sites.

Available from:

[www.catchmentsandcreeks.com.au](http://www.catchmentsandcreeks.com.au)

### Best Practice Erosion and Sediment Control.

*International Erosion Control Association, (IECA) Australasia Chapter, 2008*



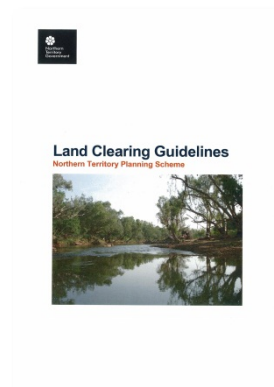
This set of six books deals with construction site ESC principles and methodology. Book 6 contains 136 individual A4 standard drawings of various ESC techniques. The standard

drawings consist of diagrams displaying typical installation layout and dimensions and specifications for the materials, installation, maintenance and removal. Standard drawings are available for 92 different ESC structures / techniques

Available from: [www.austieca.com.au](http://www.austieca.com.au)

### Land Clearing Guidelines (2010)

*NRETAS Technical Report No. 20/2009D*



These are the guidelines for clearing of native vegetation in the Northern Territory, as referenced in the NT Planning scheme.

Available from:

[www.lrm.nt.gov.au/land-clearing](http://www.lrm.nt.gov.au/land-clearing)

## Contact Details

For further information contact the DLRM Land Management Unit in your region. Additional Fact Sheets, Technical Notes and Erosion and Sediment Control Guidelines are available on the website:

<http://www.lrm.nt.gov.au/soil/management>

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