



# Land Management

## Power and Water Corporation Procedure

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### 1 Purpose

To provide information on appropriate land management techniques to be undertaken by the Power and Water Corporation on lands occupied by Power and Water.

### 2 Scope

This procedure covers land management practices that are to be undertaken by Power and Water employees on all lands occupied by Power and Water. It applies to new projects and existing facilities.

Land Management parameters covered by this procedure include:

- a) Weed management;
- b) Vegetation management;
- c) Soil conservation;
- d) Acid sulfate soil management; and
- e) Fire management.

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### 3 References

- 3.1 Bushfires Act 1980 (NT)
- 3.2 Pastoral Land Act 1992 (NT)
- 3.3 Planning Act 2000 (NT)
- 3.4 Soil Conservation and Land Utilization Act 1970 (NT)
- 3.5 Weeds Management Act 2001 (NT)
- 3.6 Northern Territory Department of Natural Resources, Environment and the Arts (2006) *Northern Territory Planning Scheme: Land Clearing Guidelines*. Technical Report 27/2002 (updated 2006). [Online]  
[http://www.nt.gov.au/nreta/natres/natveg/guidelines/pdf/Land\\_Clearing\\_Guidelines\\_2006.pdf](http://www.nt.gov.au/nreta/natres/natveg/guidelines/pdf/Land_Clearing_Guidelines_2006.pdf)
- 3.7 Northern Territory Department of Natural Resources, Environment and the Arts. n.d. *Erosion and Sediment Control Guidelines: Service Corridors*. [Online]  
<http://www.nt.gov.au/nreta/natres/soil/management/pdf/ServiceCorridors.pdf>
- 3.8 Northern Territory Department of Natural Resources, Environment and the Arts. n.d. *Declared Weeds*. [Online]  
<http://www.nt.gov.au/nreta/natres/weeds/ntweeds/declared.html>
- 3.9 Groves, R.H., Hosking, JR, Batianoff, G.N., Cooke, D.A., Cowie, I.D., Johnson, R.W., Keighery, G.J., Lepschi, B.J., Mitchell, A.A., Moerkerk, M., Randall R.P., Rozefelds, A.C., Walsh, N.G., and Waterhouse, B.M. (2003) *Weed Categories for Natural and Agricultural Ecosystem Management*. Australian Government (Dept of Agriculture, Fisheries and Forestry and Dept of the Environment and Heritage).
- 3.10 Power and Water Corporation, Environmental Assessment Process for Projects.

### 4 Roles and Responsibilities

Role / Title	Responsibility
Managing Director	<ul style="list-style-type: none"> <li>▪ Ensure Power and Water has effective procedures for managing land in place.</li> </ul>
Business Unit General Manager	<ul style="list-style-type: none"> <li>▪ Ensure that land management practices are undertaken as required.</li> </ul>
Office of the General Counsel	<ul style="list-style-type: none"> <li>▪ Provide advice regarding permit requirements under the <i>Planning Act</i>.</li> </ul>
Manager Environmental Services	<ul style="list-style-type: none"> <li>▪ Ensure that land management practices are undertaken as required.</li> <li>▪ Liaise with the relevant sections of the Department of Natural Resources, Environment and the Arts regarding land management issues as required.</li> <li>▪ Provide advice regarding appropriate land management practices to Project Managers, other Power and Water</li> </ul>

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	<p>project personnel, and Contractors.</p> <ul style="list-style-type: none"><li>▪ Assist, as required, with the implementation of land management practices.</li></ul>
<p>Business Unit Branch/Section Manager</p> <p>Project Manager</p>	<ul style="list-style-type: none"><li>▪ Bring project or facility land management issues to the attention of the Manager Environmental Services.</li><li>▪ Manage the implementation of recommendations by the Manager Environmental Services.</li></ul>
<p>Power and Water Employees</p>	<ul style="list-style-type: none"><li>▪ Undertake works in an appropriate manner in order to manage land.</li><li>▪ Report identified areas of degraded land to the Manager Environmental Services.</li></ul>

## 5 Definitions

Where terms or words are not included in the definitions section, refer to Power and Water's Glossary for clarification. The glossary is available on Power and Water's Intranet.

Acid Sulfate Soil	Soil, rich in iron sulfate, which when exposed to air and water produces sulfuric acid.
Cool Fire (Burn)	A fire which, due to high moisture content of the fuel, burns with low intensity, generally in the early dry season. Cool fires are useful as a tool to safely remove vegetation that may potentially fuel wildfires.
Declared Weed	A plant that the responsible Minister has declared to be a weed in accordance with the <i>Weeds Management Act</i> (sometimes also called noxious weed).
Employee	Means a worker employed by Power and Water, a contractor or subcontractor, and a person employed by a contractor or subcontractor, who carries out work for an employer.
Environmental Weed	A weed that invades natural ecosystems and can subsequently reduce their ecological value.
Erosivity	Tendency to be eroded.
Weed	A plant growing out of place, generally used to describe species that have self-sustaining populations.
Wildfire	Uncontrolled fire, generally burning in the late dry season. These fires are generally difficult to control and potentially very destructive to human life, assets, vegetation and wildlife.

## 6 Records

- 6.1 Relevant documentation relating to land management shall be maintained using Power and Water's Registry System.

## 7 Attachments

7.1 Nil

## 8 Weed Management

### 8.1 General Information

8.1.1 Plants that invade natural ecosystems and reduce the ecological value of these ecosystems are known as “environmental weeds”. Environmental weeds are the main category of weeds that impact on everyday operations of Power and Water. Some aquatic weeds (eg. Cabomba, Olive Hymenachne) may colonise a water body and foul the water supply. Grassy weeds such as Gamba Grass and Mission Grass in the Top End and Buffel Grass in central Australia have the potential to promote wildfires.

8.1.2 There are some 2700 species of naturalised (have self-supporting populations) non-native plants in Australia. Of these, 798 are considered to be major environmental weeds and a further 1388 are considered to be minor environmental weeds (Groves *et al.*, 2003).

8.1.3 Weeds can invade any area on which the soil or natural vegetation is disturbed, including all types of Power and Water facilities. Disturbance to natural vegetation often facilitates invasion by reducing competition from other vegetation, increasing sunlight intensity, and concentrating moisture and nutrients.

8.1.4 Weeds can be introduced to an area intentionally (by planting invasive ornamental or crop species) and unintentionally (transported on machinery or clothing). Weeds are readily introduced during construction activities as seeds on graders, dozers and other machinery used for earthworks, or during maintenance/operational phases (eg. activities such as slashing vegetation, excavation, and soil filling).

8.1.5 Under the *Weeds Management Act*, owners and occupiers of land are responsible for weed management and have a general duty to control weeds. The Act allows for the Minister to declare a plant to be a weed or a potential weed. The declaration may classify a weed according to whether it is necessary to eradicate it (Class A), control its growth and spread (Class B), or prevent its introduction into the NT (Class C). A list of declared weeds in the NT can be found at <http://www.nt.gov.au/nreta/natres/weeds/ntweeds/declared.html>.

### 8.2 Managing Weeds

8.2.1 As owners and/or occupiers of large parcels of land throughout the NT, Power and Water shall manage weeds over these areas. The first priority for weed management is prevention. This should be done via appropriate weed hygiene such as thoroughly cleaning earthmoving equipment, vegetation slashers, and vehicles before entering Power and Water sites.

8.2.2 In the event that a weed infestation is identified on Power and Water property, an assessment regarding the need for control activities should be conducted. The Manager Environmental Services can assist in undertaking this assessment. The assessment shall be based on the following factors, but not limited to:

- a) Invasiveness of the species;

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- b) Size of the infestation;
- c) Habitat;
- d) Declared status;
- e) Ease of control/eradication; and
- f) Potential threat (environmental and economical) posed by the weed.

8.2.3 If the decision is made to control the weed, but there are concerns with off-site impacts or impacts on non-target species, then the Manager Environmental Services, shall be consulted on appropriate control method(s). Methods that have proved effective in the past include:

- a) Physical removal (such as hand-pulling, grubbing with shovels/hoes etc, slashing and mulching);
- b) Land management (such as revegetation, fire, hygiene, and controlling feral animals);
- c) Chemical (spraying/dosing with a range of herbicides at appropriate concentrations); and
- d) Biological (use of weed predators (such as insects) or diseases to control weeds).

## 9 Vegetation Management

### 9.1 General Information

9.1.1 Appropriate vegetation management reduces the risk of land degradation such as weed colonisation, wild fire and erosion. It will also generally preserve wildlife in rural and remote areas. Restricting disturbance of vegetation to that within the footprint of a development or facility, and minimising effects on areas immediately surrounding the site will assist good vegetation management.

9.1.2 The *Planning Act* and the *Pastoral Land Act* control native vegetation clearing in the NT. Heavy penalties for breaches apply under both pieces of legislation.

9.1.3 Under the *Planning Act* all facilities for the reticulation of electricity, water, sewerage, and gas are exempt from requiring a permit to clear native vegetation (ie. powerlines, pipes, substations and sewer pump stations). A permit may be required if any native vegetation requires clearing for other proposed developments such as power stations, sewerage treatment plants or dams. Power and Water's Office of the General Counsel should be consulted for advice on whether a permit is required for such proposals.

### 9.2 Managing Vegetation

9.2.1 Project Managers responsible for proposals that require vegetation to be cleared should refer to the Environmental Assessment Process for Projects Procedure to determine potential risks to the environment.

9.2.2 The Land Clearing Guidelines (DNRETA 2006) provide technical advice for planning and undertaking land clearing in the NT. The guidelines outline practices to avoid/minimise adverse environmental impacts.

## 10 Soil Conservation

### 10.1 General Information

10.1.1 Erosion of soil is a natural phenomenon that can be accelerated by disturbances to soils caused by Power and Water's construction, maintenance and remedial activities. Factors that can increase the potential for erosion include:

- a) Removal of vegetation or other ground cover;
- b) Exposure to forces such as flowing water or strong winds;
- c) Increased slope; and
- d) Erosivity of soil.

10.1.2 While there is little that can be done to alter the erosivity of soil, under certain circumstances soil erosivity may warrant extra precautions when constructing a facility. In extreme cases, relocation of a proposed facility or artificial soil protection measures may be required.

10.1.3 Due care should be taken to minimise soil disturbance and vegetation removal on steep slopes ( $> 1^\circ$ ) and areas adjacent to waterways. New projects should be planned to avoid these areas where practical. Where avoidance is not practical, measures to mitigate erosion potential may be required. The Manager Environmental Services should assist with design of projects to reduce erosion potential.

10.1.4 General Principles of Erosion Management include:

- Prevention is better and cheaper than a cure;
- Include erosion prevention and control works in budget estimates;
- Get to know the types of country in your area, and design works appropriate to each area;
- Surface protection (vegetation, mulch or artificial cover) is the cheapest and most effective means of protection against erosive agents; and
- The degree and length of slope will determine the velocity of water, and thus its potential to erode. Regulating velocity by breaking up the slope with structural or natural barriers will divert runoff, increase infiltration and decrease the risk of erosion.

### 10.2 Planning for Soil Conservation

10.2.1 When planning developments, Project Managers should consider the effect the development may have on surrounding areas/properties, and how the development will fit into future directions. In particular, consideration should be given to how drainage will be affected.

10.2.2 Project Managers should consult with the Manager Environmental Services at the planning stage if advice is required on drainage.

10.2.3 Project planning should ensure areas are not left bare for long periods - vegetation retention, revegetation, mulch or artificial cover is critical.

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10.2.4 Project Managers should calculate the average ground slope where developments are planned for input into erosion control requirements.

### 10.3 Conserving Soil during Construction

10.3.1 Power and Water employees shall conserve soil during construction activities by ensuring:

- a) Construction activities are carried out during periods of dry weather whenever possible;
- b) All appropriate erosion control measures are carried out at the time of initial construction;
- c) Ground disturbance is kept to a minimum when developing an area;
- d) The natural slope is maintained as far as possible;
- e) Run-off is diverted into existing drainage lines through protected entry points;
- f) Surface hardening and/or protective cover is provided in all areas experiencing intensive use;
- g) Disturbance of creek banks is kept to an absolute minimum, and vegetation is retained within recommended buffer distances as outlined in the Land Clearing Guidelines (DNRETA 2006).
- h) Off-site disturbance is kept to the minimum required during construction activities; and
- i) Topsoil from cleared areas is conserved for use in degraded areas.

10.3.2 If employees see a problem developing during construction, the Manager Environmental Services should be contacted as soon as possible - do not wait until construction operations have finished.

### 10.4 Conserving Soil during Maintenance

10.4.1 Power and Water employees shall conserve soil during maintenance activities by ensuring:

- a) The formation of soil or vegetation windrows at the sides of cleared lines (tracks, roads, firebreaks etc.) does not occur;
- b) Vegetative or protective cover is maintained where practical. Where this is not practical, vegetative cover shall be reinstated at the conclusion of the maintenance works;
- c) Waterways are not blocked;
- d) Activity levels are adjusted according to seasonal conditions;
- e) Personal knowledge of what is happening at the site by carrying out regular inspections, and undertaking repairs as quickly as possible. In particular, inspections of newly constructed areas should be undertaken after heavy rain and heavy visitor use; and
- f) Clearance of ground vegetation does not occur within recommended buffer widths of creek/river banks unless in accordance with instructions from the

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Manager Environmental Services. Recommended buffer widths are outlined in the Land Clearing Guidelines (DNRETA 2006).

- 10.4.2 Employees should be aware that in severe cases, legislative provisions under the *Soil Conservation and Land Utilization Act (1980)* can be enacted to help protect sensitive areas (DIPE, 2005b).
- 10.4.3 Long linear developments such as powerlines and pipelines often impact on areas that are susceptible to erosion. Power and Water shall implement best practice construction techniques to avoid erosion. This will require causing minimal disturbance to ground surface and spreading cleared vegetation at the completion of works. Surface water drainage lines should generally be spanned by powerlines to reduce the likelihood of bank erosion, and vegetation clearance in these areas should be restricted to reducing the height of trees individually, to a height no lower than 100cm, by chainsaw.

## 11 Acid Sulfate Soil Management

- 11.1 Construction and maintenance activities involving earthworks in coastal wetland areas have the potential to disturb or expose acid sulfate soils (ASS). When ASS are exposed to air and water, sulfuric acid may be produced which, when released to the surrounding environment, can result in adverse environmental impacts such as altering water quality, and reducing the habitat suitability for aquatic and terrestrial flora and fauna.
- 11.2 To reduce the risk of potential impacts resulting from ASS exposure, Power and Water employees should ensure developments in coastal wetland areas are assessed for acid sulfate soils prior to earthworks. Where acid sulfate soils are determined to be present, an ASS management plan should be developed. This plan will discuss methods of undertaking the works in order to minimise sulfuric acid production and methods for managing acid that is produced. The Manager Environmental Services is responsible for developing ASS Management Plans as required.

## 12 Fire Management

- 12.1 Appropriate fire management promotes asset and personnel protection as well as habitat management. Fire management is an important part of land management and will vary for different types of Power and Water land uses and for different parts of the NT. For example, from 1 July to 30 December each year the Bushfires Council of the NT declares an area north of approximately 17 degrees South of to be a "Fire Danger Area". During this period a permit needs to be issued by the Bushfires Council in order to light a fire in the open.
- 12.2 The most important strategy to achieve Power and Water's fire management objectives is the prevention of widespread late dry season fires. These fires are often difficult to control and can pose a threat to assets, personnel, quality of water supplies, wildlife, natural vegetation, as well as promote erosion and the growth of weeds. If land is managed inappropriately, these fires can be fuelled by large accumulations of dry vegetation, and when driven by strong, dry season winds and assisted by a lack of soil moisture and surface water, can be extremely difficult to control and therefore burn very large areas of land.

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- 12.3 Through the establishment of strategically located firebreaks (formed by mechanical removal of vegetation and/or cool fires), Power and Water assets can be protected from wild fires. The *Bushfires Act* can require a land owner or manager to implement a firebreak system around certain premises.
- 12.4 According to Hadden (1993) all undeveloped land areas in the NT will burn at some stage whether intentional or not. The purpose of prescribed burning in the early dry season is to burn intentionally in a controlled manner. This will reduce the potential for undesirable wildfires later in the dry. Late season wildfires tend to scorch the ground, killing vegetation and wildlife. Once vegetation has been removed, soil becomes vulnerable to wind and water erosion.
- 12.5 Early dry season burns generally burn patchily and not as hot as late dry season burns. Therefore a controlled early dry season prescribed burn will generally preserve the roots and lignotubers of vegetation for reshooting, as well as at least some of the soil seed bank, and leave some ground cover. This enables rapid reestablishment of vegetation, minimises soil losses due to erosion, and provides cover for terrestrial wildlife. In addition, these cool burns are more manageable as they often self-extinguish during the cool of the night.
- 12.6 If fire is an ongoing management issue, the need for a Fire Management Plan should be discussed with the Manager Environmental Services.
- 12.7 Before any fires are lit, employees shall:
  - a) Notify the NT Fire and Rescue Service (urban areas) or Bushfires Council of the NT (rural) and obtain appropriate permit if applicable; and
  - b) Notify all neighbours (ie. owners of adjacent properties) at least 48 hours in advance.