

## **METHODS FOR ALIEN SPECIES REMOVAL**

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The sections below are taken from the Department of water Affairs: Working for Water Programme, whose guidelines and policies on alien plant species removal should be adhered to.

**In general the use of herbicide by is strongly discouraged – unless for direct stump applications in areas at least 30 m from any type of wetland. This is due to the potential for herbicide and related compounds to be distributed into the wetland areas and thus damaging indigenous vegetation all along the watercourses and beyond.**

Any control programme for alien vegetation must include the following 3 phases:

- Initial control: drastic reduction of existing population
- Follow-up control: control of seedlings, root suckers, and coppice growth
- Maintenance control: sustain low alien plant numbers with annual control

### **2.1. Mechanical Clearing**

#### **2.1.1. ADULT PLANTS AND SAPLINGS**

##### **2.1.1.1. Felling**

Consider as first option where possible, but see section 3 regarding kill standing – although this is only mandatory in pristine or near-natural environments, kill standing may have to be considered where the tree to be felled on the project area is very large or tilted and by falling it could significantly damage the surrounding habitat or other structures.

Where trees are to be felled and removed, the stem/trunk shall be cut as close to the ground as possible but not higher than 150mm, using chainsaws, bow saws, brush cutters or cane knives. Where felling is to be followed by herbicide treatment the cut shall either be made by means of a saw, so as to produce a clean, flat and generally horizontal surface or in the case of suitably small, thin barked species, the stem shall be cut with a lopper. A slasher or kapmes should preferably not be used because of the diagonal cut that is produced. This minimises the herbicide absorption and the “sharp sticks” are a Health and Safety risk.

In the case of larger trees, they shall, where possible, be felled to fall uphill in order to reduce breakage and minimise the danger to workmen.

Felled material and other dead material (brush and logs) shall not be allowed to block or impede water courses and must be removed from all water courses, either 30 m away from the river or out of the flood line itself.

Felled material (thicker than 7 cm) shall be debranched and cross cut in manageable logs of not longer than 2,4 m or in lengths as directed and then stacked in windrows (brush lines) with the contour or moved to or from identified locations as directed by Project Management.

The logs and brush shall be stacked separately, at least 3 m apart. Windrows shall be with gaps of 2 m every 15 m and be as narrow as possible but not wider than 3 m. Where windrows are impractical heap stacking may be allowed after approval by the Project Manager. Heaps shall be spaced at a minimum distance of 20 m with a maximum ground cover of 16 m<sup>2</sup> in other words heaps of maximum 4 X 4 m.

Windrows must be a minimum of 10 meters away from any indigenous forest (10 or more closely spaced indigenous trees). On a slope nothing should be packed below the indigenous forest, because burning of the windrows will cause damaged to the indigenous forest by burning up into it.

#### **2.1.1.2. Ring barking**

Where ring barking is directed, the Contractor shall remove all bark (including the inner bark or phloem) from ground level to 50 cm up or such lesser distance as may be specified. All bark must be removed to below ground level for good results. Where clean de-barking is not possible due to crevices in the stem or where exposed roots are present, a combination of bark removal and basal stem treatments should be carried out.

Bush knives or hatchets should be used for debarking. Herbicide can be applied to the exposed bark except in the case of Wattle spp. In the case of smaller trees and saplings with soft, thin skinned bark (especially *Acacia* and *Hakea* species.) the stem shall be beaten with the back of a hatchet and the bark peeled off.

#### **2.1.1.3. Frilling**

Where frilling is directed, the Contractor shall, at a height of approximately 50 cm, using an axe or bush knife, make angled cuts downward into the cambium layer through the bark in a ring. Ensure to affect the cuts around the entire stem and apply herbicide into the cuts.

#### **2.1.1.4. Bark Stripping**

Where bark stripping is specified all bark shall be stripped from the trunk between ground level and 1 m above ground level.

#### **2.1.2. SEEDLINGS**

##### **2.1.2.1. Manual clearing**

Where seedlings are relatively sparse, less than 1 m high and soil suitably soft or where specified in the Project Specification (where seedlings are growing in sensitive areas where chemicals cannot be used due to the risk of contamination or effect on adjacent plant populations or for any other reason), seedlings shall be removed by hand pulling which shall be so carried out as to ensure the removal of the roots. Hand pulled plants shall be left hanging on other vegetation or deposited in a pile to reduce the possibility of re-growth.

Where seedlings are dense or are too well established to be removed by hand and the Project Management has not directed hand pulling or herbicide treatment of the undisturbed plants, the seedlings shall be cut using a lopper or brush cutter (written approval must be obtained) and the stems then treated with herbicide.

*It is anticipated that after initial clearing, every year there will be a multitude of seedlings of alien species emerging. Cleared sites will thus have to be constantly monitored, and as soon as a seedling can be identified as alien invasive species, these must be pulled out by hand.*

## **2.2. Chemical Treatment**

### **2.2.1. Foliar spray**

***(Not recommended due to potential distribution of poison beyond target plants and thus killing of indigenous species)***

Where foliar spray has been specified, the spray shall be applied as to the leaves of the whole plant to the point of drip-off. Spraying shall not be done when the leaves are wet or in windy conditions. The herbicide shall under all circumstances be mixed with a suitable colour dye (if the product has no built in dye) and a wetting agent if specified on the herbicide label. Where the same herbicide is used for different methods e.g. foliar and cut-stump, different colour dyes must be used to identify the different herbicide mix ratios.

Spraying shall be done using a back-pack spraying system with a solid cone nozzle which allows for consistent, thorough application of the herbicide (e.g. Spraying systems TG 0,5 (or as indicated in the herbicide policy)).

### **2.2.2. Cut-stump treatment**

Where stumps are to be treated with herbicide the herbicide shall under all circumstances be mixed with a suitable colour dye (if the product has no built in dye) and a wetting agent if specified on the herbicide label, this shall be applied as soon as possible but not later than 15 minutes after felling, stripping or frilling. In the case of felled stumps all sawdust shall first be brushed off the cut surface.

A knapsack or handheld pressurised spray can, with a narrow angle solid cone nozzle or adjustable nozzle set to a solid spray, should be used. The pressure should be as low as possible to avoid the herbicide from bouncing off the sprayed surface and to minimise contamination; attention must be paid to achieving an even coverage only on the outer rim (Cambium area).

### **2.2.3. Basal bark application**

***(Only after written approval has been obtained, due to environmental damage caused by diesel)***

Where directed and after written approval, herbicide shall be applied directly to the basal bark of trees. The herbicide shall be applied by knapsack sprayer as a coarse, low

pressure spray, using a narrow angle solid cone nozzle, all around the basal stem or trunk of the plant, from the ground up to the height as specified on the herbicide label, as well as to any exposed roots. The area to be treated shall be thoroughly wetted by the herbicide. Attention shall be paid to ensuring adequate application taking note of the condition and age of the bark.

In the case of multi-stemmed plants, each stem shall be treated.

### **2.3. Kill Standing vs. Felling**

This section is to further explain the National Circular 18 of 2002 under the same heading.

As this National Circular contains a policy clause on the operational approach all WfW projects need to align their operations accordingly as a matter of urgency. The policy should be interpreted as follows (National policy in *Italic* font with interpretation in normal font):

*All trees must be killed standing (i.e. NOT felled), except when the following applies:* (where cut stump operations are underway on a property this will be allowed to be finished if negotiations for the property has already been concluded and written into the landowner's agreement, negotiations on new areas should thus be adapted accordingly as no further cut stump operations will be allowed except as indicated below):

- *Danger to lives & property and the tree must be removed* (it is the responsibility of Project Management to assess this with the assistance of the landowner. These findings must be recorded in writing and should form part of the landowner's agreement. The person collecting the data for contract generation should be informed accordingly)
- *All alien clearing within two tree lengths of roads, buildings, power lines etc* (fences should be added to the possibilities. It is the responsibility of Project Management to assess this with the assistance of the landowner. These findings must be recorded in writing and should form part of the landowner's agreement. The person collecting the data for contract generation should be informed accordingly)
- *Specific requirement of a partnership to fell* (this will be when the Programme and what it stands for will directly benefit from an operation other than frilling e.g. secondary industry operations, if this is not the case then the landowner must contribute to the price difference due to a change in the preferred operational method)
- *Where required to remove trees for specific flood-control measures* (no frilling should take place within the riparian zone that is the 1:20 year flood level or closer than 30 metres from the natural bank of a river. Trees in these areas should be removed.)
- *Where frilling is not a practical method due to tree growth form, treatment efficacy* (It is the responsibility of Project Management to assess this. If these exceptions

influence the workload then the person collecting the data for contract generation should be informed of such exceptions)

- *Where the frilling of trees increases the fire danger in the area (where such a scenario is suspected Project Management should liaise with the landowner and also get the opinion of a reputable person, these findings should be recorded in writing and added to the landowner's agreement)*

In most cases the resistance towards frilling are based on the aesthetics of the area after the operation. The most economical and effective method of eradicating invasive alien vegetation within the Programme's guidelines should remain the prime objective of efforts. It is the obligation and responsibility of people in all spheres of management to maximise the effect and efficiency of any eradication programme.

#### **2.4. Species-specific clearing methods**

Various herbicides have been registered for the control of alien invasive species. The first option though should always be felling the species as low as possible, followed by localised stump treatment and the remaining only as last-resort alternatives or where the alien is a vicious multi-stemmed scrambler, such as the bramble.

Chemicals do not only come at a cost, but will require proper storage, management, and handling. For operation details refer to the Working for Water Operational Standards spreadsheet provided separately.

Information for each invasive alien species as encountered on the project area, as well as alien invasive species that are highly likely to become established after initial clearing, is listed below.

**OBJECTIVE: Optimise Operational Standards for Clearing of Invasive Alien Plants**

The Contractor must take all reasonable measures to ensure the efficient use of manpower, operational equipment and chemicals for the systematic eradication of alien invasives on site.

<b>Project component/s</b>	Project components affecting the objective: <ul style="list-style-type: none"> <li>» solar energy turbines</li> <li>» access roads</li> <li>» substation</li> <li>» power line</li> </ul>
<b>Potential Impact</b>	<ul style="list-style-type: none"> <li>» Hazards to landowners, workers and public</li> <li>» Security of materials</li> <li>» Substantially increased damage to adjacent sensitive vegetation and wetland areas</li> </ul>
<b>Activities/risk sources</b>	<ul style="list-style-type: none"> <li>» Operation of equipment</li> <li>» Use of herbicides</li> <li>» Use of fire</li> <li>» Distribution of regenerative material of invasive alien plants</li> </ul>
<b>Mitigation: Target/Objective</b>	<ul style="list-style-type: none"> <li>» To ensure effective systematic removal of invasive alien plants</li> <li>» To prevent additional spreading of invasive alien plants</li> <li>» To maintain low numbers and eventually eradicate unwanted species from the project area</li> <li>» To prevent any spillage of chemicals into the surrounding environment</li> <li>» To prevent and reverse damage to wetlands/pans caused by invasive alien plants</li> <li>» To protect members of the public/landowners/residents</li> </ul>
<b>Timeframe</b>	<ul style="list-style-type: none"> <li>» Training required: training schedule and training opportunities identified and started within three months of commencement of clearing</li> </ul>

	<ul style="list-style-type: none"> <li>» Initial control involving planning and drastic reduction of existing population: during site establishment and construction phase</li> <li>» Follow-up control: control of seedlings, root suckers and coppice growth: during construction and operational phase</li> <li>» Maintenance control: sustain low alien plant numbers with annual control: during operational and decommissioning phase</li> </ul>
<b>Abbreviations</b>	<ul style="list-style-type: none"> <li>» Working for Water Programme (WfW)</li> <li>» Health and Safety (H&amp;S)</li> </ul>
<b>Responsibility</b>	<b>RESPONSIBLE PERSON OR UNIT</b>
	PROJECT MANAGER PM
	CONTRACTOR/COMMUNITY WORKER C
	ENVIRONMENTAL CONTROL OFFICER / COMMUNITY LIASION OFFICER ECO
	TRAINING UNIT TU
	PLANNING UNIT PU

<b>Mitigation: Action/control</b>	<b>Responsibility</b>
<b>1. PROJECT OPERATIONAL PLANNING</b>	
<b>1.1. Creation of detailed map of the area:</b> Provides an overview of the project and it must indicate the following:	
<ul style="list-style-type: none"> <li>• Project boundaries</li> </ul>	PU
<ul style="list-style-type: none"> <li>• Area/s where workers are sourced from</li> </ul>	PM
<ul style="list-style-type: none"> <li>• Other features relevant to project wetlands, invasive thickets, grazing areas, cultivated areas</li> </ul>	PM, PU



<b>Mitigation: Action/control</b>	<b>Responsibility</b>
<ul style="list-style-type: none"> <li>Clearly indicate areas that need to be cleared and divide into different Management Units according to location and most prevalent invasive</li> </ul>	PM, PU
<b>1.2. Strategic plan and safety</b>	
<ul style="list-style-type: none"> <li>Project Management to create an Area Strategic Plan / Method Statement for clearing alien invasive vegetation</li> </ul>	ECO, PM
<ul style="list-style-type: none"> <li>Project Management to be familiar with the Area Strategic Plan</li> </ul>	ECO, PM
<ul style="list-style-type: none"> <li>Evidence of Rules &amp; Regulations given and explained to Contractor or Community Workers (this should include the Operating Standards)</li> </ul>	PM, C
<ul style="list-style-type: none"> <li>Emerging and potential weeds reported through agreed communication lines, ecologist can be consulted for proper identification</li> </ul>	PM
<ul style="list-style-type: none"> <li>A copy of the emergency plan and telephone numbers must be on site, workers must demonstrate knowledge thereof</li> </ul>	PM
<b>1.3. Management Unit Clearing Plan (MUCP)</b>	
<ul style="list-style-type: none"> <li>It must be up to date</li> </ul>	PU, PM
<ul style="list-style-type: none"> <li>A clearing strategy must be evident and supported by the planned priorities</li> </ul>	PU, PM
<ul style="list-style-type: none"> <li>Project Managers must be able to show actual work done vs. planned work, supported by fixed point photographs</li> </ul>	PM

<b>2. TOOLS AND EQUIPMENT</b>	
<b>2.1. Hand tools in good condition and used correctly</b>	
<ul style="list-style-type: none"> <li>Hand tools(e.g. lopper, pruning saw etc.) must be best suited to the work and the size of plants being cleared</li> </ul>	PM, C
<ul style="list-style-type: none"> <li>The tools must have correct and properly secured handles and must be in safe working order</li> </ul>	C
<ul style="list-style-type: none"> <li>A sharpening stone/file, with a hand grip, must be on site</li> </ul>	C
<ul style="list-style-type: none"> <li>Gloves and goggles must be worn when sharpening tools</li> </ul>	C
<ul style="list-style-type: none"> <li>The tools must be used in the correct manner; clearing must be done using the correct techniques</li> </ul>	C, PM
<ul style="list-style-type: none"> <li>Safe working distances of at least two (2) tool-reach lengths apart must be maintained</li> </ul>	C, PM
<b>2.2. Chainsaws good condition and used correctly</b>	
<ul style="list-style-type: none"> <li>Operators have received certified training in chainsaw operation, felling, cross-cutting and de-branching techniques and have been assessed for competence every six months. For training opportunities contact the regional WfW or otherwise qualified entity</li> </ul>	PM, TU
<ul style="list-style-type: none"> <li>The chainsaws must be best suited to the clearing work and timber size</li> </ul>	PM, C
<ul style="list-style-type: none"> <li>There must be a service maintenance schedule for all chainsaws Services (daily, weekly) are done and recorded</li> </ul>	PM, C
<ul style="list-style-type: none"> <li>Safety and operational features must be in good order as per standard checklist</li> </ul>	PM, C
<ul style="list-style-type: none"> <li>Chainsaw work is planned and executed for safe and efficient production</li> </ul>	PM, C
<ul style="list-style-type: none"> <li>Correct felling / clearing techniques are applied</li> </ul>	PM, C
<ul style="list-style-type: none"> <li>Correct cross-cutting and de-branching techniques are applied.</li> </ul>	PM, C

<ul style="list-style-type: none"> <li>• Correct re-fuelling procedures are followed to prevent spillages</li> </ul>	C
<ul style="list-style-type: none"> <li>• Chain sharpening is correctly done with the correct tools at each refueling</li> </ul>	C
<b>2.3. In-field fuel site</b>	
<ul style="list-style-type: none"> <li>• A cleared area, at least six (6) metres from rest areas, demarcated with hazard tape must be used to store fuel</li> </ul>	C
<ul style="list-style-type: none"> <li>• Fuel and oil containers at the in-field fuel site must be stored on an absorbent drip-mat or drip-tray</li> </ul>	C
<ul style="list-style-type: none"> <li>• A 2 kg dry chemical powder (DCP) fire extinguisher must be at least 3m distant from the fuel site and easily visible</li> </ul>	C
<b>3. STORES, WORKSHOPS AND OFFICES</b>	
<b>3.1. Stores, workshops and offices</b>	
<ul style="list-style-type: none"> <li>• Buildings and containers must be secure and provide safe storage space for equipment and/or supplies</li> </ul>	PM
<ul style="list-style-type: none"> <li>• The office / stores area must show a high standard of housekeeping (A place for everything, everything in its place)</li> </ul>	PM
<b>3.2. Herbicide stores</b>	
<ul style="list-style-type: none"> <li>• The building / container must meet the Herbicide Policy standards</li> </ul>	PM
<ul style="list-style-type: none"> <li>• A Material Safety Data Sheet and Label must be in the store for each stock category of herbicide stored. (Each product.)</li> </ul>	PM
<ul style="list-style-type: none"> <li>• Herbicides must be issued with reference to the WIMS contract number</li> </ul>	PM
<ul style="list-style-type: none"> <li>• There must be stock control of empty containers.</li> </ul>	

<ul style="list-style-type: none"> <li>• Empty containers must be stored until removal by a registered recycling company</li> </ul>	ECO
<ul style="list-style-type: none"> <li>• Excess, undiluted herbicide must be returned to the stores and noted on the stock sheet. Excess, diluted herbicide must be stored in a UV-resistant container and allocated to another treatment within 2 days or returned to a suitable container in the stores</li> </ul>	ECO, C
<ul style="list-style-type: none"> <li>• Burning of empty containers by Project staff or Contractor is prohibited</li> </ul>	PM, C
<b>3.3. Fuel and flammable liquids stores</b>	
<ul style="list-style-type: none"> <li>• The building / container must be suitable for the liquids stored in them</li> </ul>	ECO
<ul style="list-style-type: none"> <li>• Quantities limited to allowed maximum per class where proper storage facilities are not available:                             <ul style="list-style-type: none"> <li>○ Class I – 45L (petrol, thinners)</li> <li>○ Class II – 270L (diesel, lube oils)</li> </ul> </li> </ul>	
<ul style="list-style-type: none"> <li>○ Class I – 45L (petrol, thinners)</li> </ul>	PM
<ul style="list-style-type: none"> <li>○ Class II – 270L (diesel, lube oils)</li> </ul>	PM
<ul style="list-style-type: none"> <li>• Proper housekeeping and handling procedures must be evident</li> </ul>	PM
<ul style="list-style-type: none"> <li>• Adequate measures to deal with spillage and contamination e.g. spill kit</li> </ul>	PM
<ul style="list-style-type: none"> <li>• Correct signage and fire-fighting equipment e.g. dry chemical powder fire extinguisher of at least 2.25kg</li> </ul>	PM
<b>3.4. Storage at contractor stores / houses:</b> Where contractors cannot make use of proper dedicated stores, the following standards apply:	
<ul style="list-style-type: none"> <li>• All equipment, supplies, herbicides, fuel and oils must be safely and securely stored with controlled access, in a suitable lockable building, container or a lockable trailer</li> </ul>	C
<ul style="list-style-type: none"> <li>• A 1kg dry chemical powder (DCP) fire extinguisher must be available outside the store / container</li> </ul>	C

<ul style="list-style-type: none"> <li>PM to annually verify and keep record of inspection of compliance regarding storing facilities at contractors store / house</li> </ul>	PM
<b>4. HERBICIDES</b>	
<b>4.1. General</b>	
<ul style="list-style-type: none"> <li>Workers must be specifically allocated and trained to work with herbicides and demonstrate knowledge of the risk of working with the selected chemicals and how to avoid that risk (NB: only employees with Pest Control Operator (PCO) certificates may administer herbicides and that such a team must work under direct supervision of a person with AVCASA registration in terms of the Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act No. 36 of 1947))</li> </ul>	TU, PM
<ul style="list-style-type: none"> <li>Only registered herbicides as detailed in the WfW herbicide policy or on the product label may be used</li> </ul>	PM
<ul style="list-style-type: none"> <li>A Material Safety Data Sheet (MSDS) and Label must be in the field for each product used</li> </ul>	PM, C
<ul style="list-style-type: none"> <li>Written approval must be obtained via the approved communication channels from the National Office to use an unregistered herbicide for a particular specie or situation</li> </ul>	PM, ECO
<ul style="list-style-type: none"> <li>Mix water must be clean &amp; clear (not muddy)</li> </ul>	C, PM
<ul style="list-style-type: none"> <li>Spray mix adjuvants (e.g. wetters, buffers etc.) must be used according to label instructions</li> </ul>	PM, C
<ul style="list-style-type: none"> <li>In the absence of a built-in colourant a suitable dye must be used in applications</li> </ul>	PM, C
<ul style="list-style-type: none"> <li>Contractors and applicators must demonstrate an understanding of why herbicide applications should not be done in unsuitable weather conditions; e.g. foliar application in windy conditions</li> </ul>	C
<ul style="list-style-type: none"> <li>Quality check records must show that application methods are monitored for targeting, rates and spray drift</li> </ul>	C, PM

• Where there is a risk of herbicide applicators entering water, knapsacks should be filled only half full	C, PM
• PM must submit a Herbicide-used sheet for every completed contract, information must be captured	PM, PU
• Herbicide applicators must demonstrate an understanding of spot spray patterns	C
• For cut-stump / frill / ring-barking, coverage must be even and spraying must be monitored to limit excessive run-off	C
<b>4.2. Equipment</b>	
• Equipment must be properly maintained according to regular scheduled services	C
• Equipment must not leak. Faulty equipment must be serviced or decommissioned	C
• Equipment appropriate to the application method and treatment must be used.	PM, C
• When using knapsack sprayers the following apply:	
○ Knapsack sprayers must be fitted with pressure regulators set to the correct pressure (1bar / 100Kpa) or fitted with a constant flow valve	PM, C
○ Knapsack sprayers must be fitted with the correct nozzle in good condition, appropriate for the application method used (e.g. TG1; FL5VS; TFVS2 or equivalent)	PM, C
• Lances must be secured to prevent damage when transporting.	C
• Washing of equipment must take place in a designated area, using the triple-rinse method	C
<b>4.3. Safe storage and handling in-field</b>	
• In a designated, shaded demarcated area	C
○ Away from rest / eating areas	C

○ At least 20m from any water body	C
○ Away from crops, gardens etc.	C
○ Floor area covered suitable absorbent material	C
○ Bucket & spade must be available in case of spills	C
○ Clean water, washing bucket, soap & towel must be available for persons handling the herbicide & equipment	C
• Mixing containers must be UV resistant and leak proof	C
• Mixing containers must be clearly labeled, showing the brand name and concentration of the contents	C
• Refilling, mixing, washing and rinsing should only be done within the demarcated area	C
• Empty product containers must be triple-rinsed and punctured before it is returned to the store	C
• Rinsed water must be recycled for subsequent mixes	C
• Contractors must have proper records of daily herbicide mixtures and issues and actual herbicide use in the contracting teams on-site	C
<b>5. SAFETY</b>	
<b>5.1. Hazard Identification and Risk Assessments (HIRA)</b>	
• The HIRA process to be developed, recorded and available at the project / area and knowledge demonstrated by everyone.	PM,C
• Site Emergency Evacuation Plan must be drafted and communicated to all personnel.	PM,C
• Where relevant, hazards in the working area must be taped off. e.g. trenches, holes, hang-ups etc.	C

<ul style="list-style-type: none"> <li>The Written Safe Work Procedures Manual must be available, understood and adhered to by all working staff.</li> </ul>	PM, C
<b>5.2. First Aid kit</b>	
<ul style="list-style-type: none"> <li>A first aid kit, fully stocked according to the standard stock list, must be easily accessible at all work sites, and regularly inspected by the PM.</li> </ul>	PM, C
<ul style="list-style-type: none"> <li>All first aid treatment and usage of stock must be recorded in the dressing book kept on site / regional office.</li> </ul>	C, PM
<ul style="list-style-type: none"> <li>The First Aid kit must be under control of a trained First Aider with a current valid certificate</li> </ul>	C, PM
<ul style="list-style-type: none"> <li>There must be an alternative trained First Aider of opposite gender in the team</li> </ul>	C
<ul style="list-style-type: none"> <li>A list of emergency numbers must be kept in the first aid box e.g. ambulance, doctor, hospital, fire brigade, poison info centre</li> </ul>	C, PM
<ul style="list-style-type: none"> <li>A copy of the competency certificate of the first-aider must be kept on-site in the H&amp;S file.</li> </ul>	C, PM
<b>5.3. Personal Protective Equipment and Clothing (PPE)</b>	
<ul style="list-style-type: none"> <li>PPE must meet the minimum prescribed standards of quality (EU or SABS).</li> </ul>	C, PM
<ul style="list-style-type: none"> <li>PPE must be replaced when it becomes ineffective through wear &amp; tear.</li> </ul>	C, PM
<ul style="list-style-type: none"> <li>PPE must be provided with due consideration to the hazard exposure as well as the PPE requirements as per occupation</li> </ul>	C, PM
<ul style="list-style-type: none"> <li>A record must be kept of all PPE issued to contractors and workers, and signed for by them, with the acknowledgement to wear the PPE.</li> </ul>	PM, C
<ul style="list-style-type: none"> <li>Project must conform to acceptable H&amp;S Guidelines</li> </ul>	PM, C



<b>5.4. Substance abuse</b>	
<ul style="list-style-type: none"> <li>The use of any mind altering substances is not allowed on-site (e.g. alcohol, dagga).</li> </ul>	PM, C
<ul style="list-style-type: none"> <li>Persons in the WfW programme must demonstrate knowledge of the potential dangers and the workplace policy of drug use</li> </ul>	ECO, PM, C
<b>5.5. Extreme Weather Conditions</b>	
<ul style="list-style-type: none"> <li>Demonstrate knowledge that no work in / near / on water bodies may take place during rain or lightning.</li> </ul>	PM,C
<ul style="list-style-type: none"> <li>No felling or spray application of herbicides may take place during high wind conditions</li> </ul>	PM,C
<ul style="list-style-type: none"> <li>The contractor should be informed of any adverse weather conditions</li> </ul>	PM
<b>6. METHOD OF WORK</b>	
<b>6.1. Appropriate clearing methods applied</b>	
<ul style="list-style-type: none"> <li>A process of appropriate clearing method selection must be followed and recorded - use the species guide provided</li> </ul>	PM
<ul style="list-style-type: none"> <li>Handling / processing of cleared material must be kept to a minimum, but due to a potential fire hazard and the allelopathic effect of leaf litter, cleared material must not be left on site. A specific area must be designated to stack and process material to make maximum use of wood for community members, whilst regenerative material must be destroyed by controlled burning.</li> </ul>	PM, C
<ul style="list-style-type: none"> <li>A copy of the Treatment Methods table must be available in the Project Office</li> </ul>	PM
<ul style="list-style-type: none"> <li>No frilling / ring barking is allowed within two (2) tree lengths of roads, fences, telephone and power lines, infrastructure (e.g. buildings) or in the <b>riparian zone of a river</b></li> </ul>	PM
<b>6.2. Follow-up done timeously</b>	

<ul style="list-style-type: none"> <li>An up-to-date follow-up plan must be used to ensure treatment is done on time</li> </ul>	PM
<ul style="list-style-type: none"> <li>For foliar treatment there must be sufficient newly-growing foliage and plants must not exceed hip height</li> </ul>	PM, C
<ul style="list-style-type: none"> <li>When follow-up operations are not done at the most cost-efficient stage, there must be specific reasons on record including cost/person day variations between planned and actual follow-up to be recorded</li> </ul>	PM
<b>6.3. Efficient team operation</b>	
<ul style="list-style-type: none"> <li>Operational planning for the specific site must be evident. Different tasks must be coordinated in an efficient manner for optimum productivity. If possible, every management unit mapped should have its own team allocated.</li> </ul>	PM, C
<ul style="list-style-type: none"> <li>Tool use and tasks must be in line with the site-specific requirements</li> </ul>	C
<ul style="list-style-type: none"> <li>Daily or weekly production tasks must be set and actual production must be measured and recorded</li> </ul>	C
<b>6.4. Work methods conform to WfW standards</b>	
<ul style="list-style-type: none"> <li>Record of inspection of method, quantity and quality according to the contract.</li> </ul>	PM, C
<ul style="list-style-type: none"> <li>All invasive alien species treated within the contract boundaries</li> </ul>	PM, C
<b>7. ENVIRONMENTAL AWARENESS</b>	
<b>7.1. Site clean and free of litter and waste</b>	
<ul style="list-style-type: none"> <li>There must be no litter from clearing activities on work sites, at any time and there must be a litter bag on site at the demarcated gathering area, cleared or removed daily and disposed of in an acceptable manner.</li> </ul>	C

<ul style="list-style-type: none"> <li>Existing litter not cleared in light of possible health risks, that may be associated with certain waste, reported to PM and disposal solution with relevant authority found</li> </ul>	PM, C
<ul style="list-style-type: none"> <li>Project Manager and contractors to demonstrate knowledge that soil contaminated with oil must be appropriately treated and disposed of at a permitted landfill site.</li> </ul>	PM, C
<ul style="list-style-type: none"> <li>When loose waste material is transported on vehicles, it must be adequately tied down / covered and contained.</li> </ul>	PM, C
<b>7.2. Sanitation</b>	
<ul style="list-style-type: none"> <li>As far as practically possible, provide formal sanitation (chemical or water-born). Where this is not possible, a spade and toilet paper must be easily accessible on every site.</li> </ul>	C
<ul style="list-style-type: none"> <li>Human waste and used toilet paper must be buried at least 20 m distant from any watercourses or bodies and at least 50 cm deep.</li> </ul>	C
<ul style="list-style-type: none"> <li>In sensitive areas (urban sites, wetlands) a portable toilet must be provided on site and the waste removed and disposed of in an acceptable manner.</li> </ul>	C
<ul style="list-style-type: none"> <li>Clean water and soap must be provided and used for hand washing.</li> </ul>	C
<ul style="list-style-type: none"> <li>The workers should be informed of personal hygiene and demonstrate its practice</li> </ul>	C, PM
<ul style="list-style-type: none"> <li>Where relevant, sufficient toilets per gender need to be available</li> </ul>	C, PM
<b>7.3. Access routes</b>	
<ul style="list-style-type: none"> <li>Existing access routes must be used. Where new access routes or paths are required, these must be planned and made in co-operation with the landowner / manager and marked with hazard tape</li> </ul>	PM, C
<b>7.4. Indigenous plants and animals</b>	
<ul style="list-style-type: none"> <li>Indigenous plants should not be damaged where possible and animals must not be harmed.</li> </ul>	C

<ul style="list-style-type: none"> <li>• Alien trees with bird nests must be killed standing where possible. Site records must be kept.</li> </ul>	PM, C
<ul style="list-style-type: none"> <li>• Collection of plant parts of alien plants for medicinal or other purposes, may only take place with the appropriate permission. Collection records must be kept.</li> </ul>	C
<ul style="list-style-type: none"> <li>• Identify and protect indigenous plants and animals, especially:             <ul style="list-style-type: none"> <li>○ Red list data species (none recorded)</li> <li>○ Protected plants (see species of conservation concern)</li> <li>○ Sensitive communities (wetlands only, no other recorded on project area)</li> <li>○ Wetlands</li> </ul> </li> </ul>	C
<ul style="list-style-type: none"> <li>• No species of animal may be poached, snared, hunted, captured or willfully harmed, damaged or destroyed. Snares must be reported to land owners, PM or conservation authorities and removed immediately.</li> </ul>	C
<ul style="list-style-type: none"> <li>• Snakes and other reptiles that may be encountered on the treatment area must not be killed.</li> </ul>	C
<ul style="list-style-type: none"> <li>• Anthills and/or termite nests that occur must not be disturbed.</li> </ul>	C
<ul style="list-style-type: none"> <li>• Keep the relevant managers informed of dangerous or problem animals. Record sightings and encounters.</li> </ul>	PM, C
<ul style="list-style-type: none"> <li>• Keep food and rubbish out of reach of scavengers, e.g. apes and birds.</li> </ul>	C
<p><b>7.5. Invasive alien plant identification (IAP)</b></p>	
<ul style="list-style-type: none"> <li>• Alien invasive plants including aquatic alien plants must be identified, where required expert assistance must be used.</li> </ul>	PM, C
<ul style="list-style-type: none"> <li>• The relevant species to be removed must be pointed out to contractors and workers on site.</li> </ul>	PM

<ul style="list-style-type: none"> <li>• Damage to indigenous / desirable vegetation must be minimised.</li> </ul>	C
<b>7.6. Alien invasive dispersal</b>	
<ul style="list-style-type: none"> <li>• Where cleared material must be moved from the site, measures must be taken to prevent dispersal of reproductive material (e.g. seeds, cuttings).</li> </ul>	PM, C
<ul style="list-style-type: none"> <li>• Chipped plant material must be free of seed if used off-site (e.g. mulch).</li> </ul>	PM, C
<ul style="list-style-type: none"> <li>• Plants which have been removed must not be transported across or near to rivers or dams in which the species is absent.</li> </ul>	PM, C
<ul style="list-style-type: none"> <li>• Removed plants must not be stacked on top of indigenous flora.</li> </ul>	PM, C
<ul style="list-style-type: none"> <li>• Method and specifications chosen with due consideration of impact on the site, natural vegetation &amp; regeneration.</li> </ul>	PM
<ul style="list-style-type: none"> <li>• Methods used must ensure that weeds are not distributed by the contractor and employees</li> </ul>	PM, C
<b>7.7. Site stabilisation / anti-erosion / rehabilitation measures</b>	
<ul style="list-style-type: none"> <li>• <b>Stack larger cut logs</b> along the contour and below knee height with 2 m gaps at 10 to 15 m intervals for access, escape, animal movement and to reduce run-off and soil movement where there is an enhanced erosion risk along stream banks or steeper slopes</li> </ul>	PM, C
<ul style="list-style-type: none"> <li>• Preserve indigenous plant cover and adapt treatment methods to allow indigenous plants to colonize the site.</li> </ul>	PM, C
<ul style="list-style-type: none"> <li>• Identify sites requiring additional stabilisation structures / measures / re-vegetation and obtain expert advice &amp; planning to implement.</li> </ul>	PM
<ul style="list-style-type: none"> <li>• Take precautionary measures to protect stabilising plants (planted &amp; natural) during follow-up spraying.</li> </ul>	C

<b>7.8. Site stabilisation / anti-erosion / rehabilitation records</b>	
<ul style="list-style-type: none"> <li>Sites must be mapped and a unique Treatment Area number must be assigned. Comprehensive planting / maintenance records must be kept; including dates, species and number of plants and follow-up care.</li> </ul>	PM
<ul style="list-style-type: none"> <li>A record of input costs must be kept, including: materials, plants, seeds, person-days etc.</li> </ul>	PM
<b>8. FIRE FIGHTING AND PROTECTION</b>	
<b>8.1. Fire Precautions on work sites</b>	
<ul style="list-style-type: none"> <li>Smoking allowed in safe indicated areas, designated by the contractor / manager / landowner.</li> </ul>	PM, C
<ul style="list-style-type: none"> <li>No fires are allowed on work sites.</li> </ul>	PM, C
<ul style="list-style-type: none"> <li>Site specific reaction / evacuation rules must be applied in the case of wild fires.</li> </ul>	C
<ul style="list-style-type: none"> <li>Basic appropriate fire-fighting equipment must be available at each work site; a minimum of five fire beaters and one filled knapsack fire-fighting pump, or alternative suitable equipment.</li> </ul>	PM, C
<ul style="list-style-type: none"> <li>Where fuels and machines are used on site, a 2 kg dry chemical powder fire extinguisher in working condition must be available.</li> </ul>	PM, C
<ul style="list-style-type: none"> <li>Fire Fighting &amp; Extinguishing Equipment inspected and recorded.</li> </ul>	PM
<b>8.2. Fire Protection</b>	
<ul style="list-style-type: none"> <li>The project must be a member of the Fire protection Association (FPA) and attend meetings where applicable</li> </ul>	ECO, PM
<ul style="list-style-type: none"> <li>In FPA areas, the project must be on their communication network.</li> </ul>	ECO, PM

<ul style="list-style-type: none"> <li>Fieldwork may not take place during red days or extreme danger rating days. (Contact Working on Fire office)</li> </ul>	ECO, PM
<b>9. TRAINING</b>	
<b>9.1. Induction</b>	
<ul style="list-style-type: none"> <li>All new workers must receive orientation before starting work.</li> </ul>	PM
<b>9.2. Compulsory functional training</b>	
<ul style="list-style-type: none"> <li>All training, including refresher courses, is compulsory.</li> </ul>	TU, PM
<ul style="list-style-type: none"> <li>All training must be provided to workers and contractors within three months of commencement of work</li> </ul>	TU, PM
<ul style="list-style-type: none"> <li>Project Managers must hold a valid training certificate, on file, for <b>all</b> the training courses required in their project. Alternatively, arrangement must be made with the WfW Programme or suitably qualified units to provide such training</li> </ul>	PM
<ul style="list-style-type: none"> <li>Training must be in line with the latest WFW Training Policy</li> </ul>	TU, PM
<ul style="list-style-type: none"> <li>Area / Project Managers must pass an Environmental Pest Control Course and apply for PCO Registration with the National Dept. Agric - Registrar.</li> </ul>	TU
<ul style="list-style-type: none"> <li>Contractors - Limited Pest Control course.</li> </ul>	TU
<ul style="list-style-type: none"> <li>Herbicide Applicators – WfW Herbicide Applicators course.</li> </ul>	TU
<ul style="list-style-type: none"> <li>Other workers – Herbicide Awareness training.</li> </ul>	TU
<ul style="list-style-type: none"> <li>Chain saw operators - chainsaw handling and maintenance, felling, cross-cutting and de-branching techniques.</li> </ul>	TU

<ul style="list-style-type: none"> <li>Copies of all herbicide training certificates received and Pest Control Licenses must be available with the PM and contractor on-site.</li> </ul>	<p>PM, C</p>
<p><b>9.3. Training Plan &amp; Profiles</b></p>	
<ul style="list-style-type: none"> <li>The Training Annual Plan of Operations must be displayed.</li> </ul>	<p>PM</p>
<ul style="list-style-type: none"> <li>The plan must be based on the WFW training matrix and policy.</li> </ul>	<p>TU, PM</p>
<p><b>9.4. Training Records</b></p>	
<ul style="list-style-type: none"> <li>All training capture sheets, attendance registers, evaluation forms, and certificates must be filed in the Regional Training Manager’s office or Area office.</li> </ul>	<p>TU, PM</p>
<ul style="list-style-type: none"> <li>All Department of Labour monitoring sheets, correspondence, financial records and training schedules must be filed in the Regional Training Manager’s office or Area office.</li> </ul>	<p>TU</p>
<p><b>9.5. Accreditation</b></p>	
<ul style="list-style-type: none"> <li>All training must be aligned to unit standards, where possible.</li> </ul>	<p>TU</p>
<ul style="list-style-type: none"> <li>All training must be provided by accredited training providers, where possible.</li> </ul>	<p>TU</p>
<p><b>Performance Indicator</b></p>	<ul style="list-style-type: none"> <li>» Project area is consistently cleared of invasive alien vegetation</li> <li>» Remnants of alien vegetation removed from where they were cleared to make way for the proposed development and rehabilitation of natural vegetation surrounding the development</li> <li>» No indication of further degradation and/or pollution of the areas surrounding the development</li> <li>» No members of staff/ public/ landowners injured</li> </ul>
<p><b>Monitoring</b></p>	<ul style="list-style-type: none"> <li>» Regular visual inspection of cleared areas for signs of resprouting, alien plant seedling emergence, new alien species invasions</li> <li>» An incident reporting system will be used to record non-conformances to the EMP.</li> </ul>



- » Public complaints register must be developed and maintained on site.
- » ECO to monitor all construction areas on a continuous basis until all construction is completed; immediate report backs to site manager.
- » ECO to address any infringements with responsible contractors as soon as these are recorded.