Consultants Plant Supply Self Audit Checklist

THIS CHECKLIST MUST BE USED TO GUIDE THE WETLAND PLANTING CONSULTANT THROUGH THE CRITERIA REQUIRED TO MEET MELBOURNE WATERS WETLAND PLANT SUPPLY REQUIREMENTS AS OUTLINED IN THE AQUATIC, EPHEMERAL AND TERRESTRIAL PLANT SUPPLY STANDARD AND THE WETLAND DESIGN MANUAL (PART A2). **THIS FORM MUST BE SUBMITTED TO MELBOURNE WATERS MAJOR WORKS SURVEILLANCE OFFICER PRIOR TO PLANT INSTALLATION OCCURING.**

The following symbol **'*'** in the tables below indicates a mandatory or non-negotiable condition.

Plant supply formats

Condition		Met		If No, provide justification
		Yes	No	
Correct format plants (90cm3 hiko cell, 200cm3 tube, 550cm3 container) have been supplied for the correct planting zones as per appendix A.	*			
Minimum height (mm) requirements specified in the Aquatic, Ephemeral & Terrestrial Plant supply audit form have been met	*			
Quality of stock supplied is appropriate as per the Aquatic, Ephemeral & Terrestrial Plant supply audit form requirements	*			
Species substitutions have been accepted by Melbourne Water	*			
Quantity of plants supplied is to order or as per the delivery docket	*			

Plant Appearance - Foliage

Condition		Met		If No, provide justification
		Yes	No	
Plant foliage is healthy	*			
Plant foliage is firm-textured	*			
Plant foliage is insect free	*			
Plant foliage is free of fungal or physical damage	*			
Plant has been hardened off prior to delivery (3 weeks)	*			

Plant Appearance - Roots

Condition		Met		If No, provide justification
		Yes	No	
Vigorous actively growing roots with fresh white tips are present on all plants	*			

When removed from the tube or container, soil is held within the root structure with no material dropping away	*			
Plant containers have an effective root trainer to prevent root circling	*			
Minimal root protrusion through the bottom of a container is visible	*			
Excessive root growth is not present	*			
Roots don't extend from one tube or container to another	*			
Stock is not root bound	*			
Stock has no spiralling roots	*			

Plant Appearance - Shoot-root ratio

Condition		Met		If No, provide justification
		Yes	No	
Plants have a balanced shoot-root ratio (optimal ratio for forestry tubestock is 1-1.5. Maximum ratio is 1:2)	*			
Plants don't appear stunted i.e. with a ratio less than 1:1	*			
Stock is less than 12 months of age	*			

Aquatics & Semi Aquatics (ephemeral planting)

Condition		Met		If No, provide justification
		Yes	No	
No wild harvested material is present?	*			
Plants have been propagated, grown on and hardened off prior to delivery (3 weeks)	*			
Plant units are clearly quantified to ordered specifications and traceable to delivery dockets as per appendix C	*			
The plant is not senescing? (some dead foliage may be apparent)	*			
Plants are not excessively vigorous with soft weeping foliage due to over fertilisation	*			
550cc plants have >50% surface cover with plant stems and evidence of growth from rhizomes.	*			
Plant heights meet requirements of Appendix A	*			

Location in pot

Condition		Met		If No, provide justification
		Yes	No	
Plants is centrally located within cell or tube or container	*			
There are not multiple stems of species in a tube or hiko present	*			

Hardening off

Condition		Met		If No, provide justification
		Yes	No	
Plants have been adequately hardened off prior to supply (3 weeks)	*			
Plants are not excessively vigorous with soft weeping foliage due to over fertilisation	*			
Detailed records from suppliers are available to demonstrate appropriate hardening off (3 weeks).	*			

J rooting

Condition		Met		If No, provide justification
		Yes	No	
No deformity such as stunted growth, premature death or wind throw is present	*			
Greater than 2% J rooting is not present	*			

Disease Free

Condition		Met		If No, provide justification
		Yes	No	
Stock is free of substantial insect and fungal infection	*			
No Myrtle Rust is present	*			

Media quality and weed competition

Condition		Met		If No, provide justification
		Yes	No	
Excessive (i.e.> 25% per unit) lichen, liverworts, or mosses is not present	*			
Plant material with nursery weeds is not evident	*			

Landscape contractor selection and plant supply

Condition		Met		If No, provide justification
		Yes	No	
The landscape contractor awarded the wetland project has ordered stock from a nursery that grows plants to the specifications outlined within the aquatic, ephemeral and terrestrial plant supply standard and the Melbourne Water Wetland Design Manual: Part A2 Deem to comply design criteria (no wild stock or cutting up of planting clumps is to be installed).	*			
Planting contractor has supplied Melbourne Water with delivery dockets to ensure the number of plants and format of plants ordered and delivered matches the landscape plan and requirements of the aquatic, ephemeral and terrestrial plant supply standard and the Melbourne Water Wetland Design Manual: Part A2 Deem to comply design criteria	*			
Planting consultant and contractor have audited the quality of stock delivered to site prior to the installation occurring accepting and/or rejecting any unacceptable stock that doesn't meet the requirements of the aquatic, ephemeral and terrestrial plant supply standard and the Melbourne Water Wetland Design Manual: Part A2 Deem to comply design criteria	*			
Planting contractor has undertaken random audits of the nursery's they regularly source stock from to ensure the stock they are growing and supplying is of a high quality and meets the requirements of the Consultants Nursery Inspection Audit Form and the Melbourne Water Wetland Design Manual: Part A2 Deem to comply design criteria	*			

I declare and acknowledge that I have submitted the above checklist in its entirety in accordance with the aquatic, ephemeral and terrestrial plant supply standard and the Wetland Design Manual (Part A2). I further acknowledge that if the above information in incomplete or inaccurate it will be returned and will not be considered lodged with Melbourne Water. Plants can't be installed until the above requirements are met in full.

Signature: Date:

Print name: Position:

Appendix A: Plant supply formats.

Growing formats for species specified in the *Wetland Design Manual. Part A2: Deemed to comply design criteria*.

See the manual for the correct zonation information for each species.
Species not on the list below can only be used if approved by Melbourne Water and the growing format suits their morphology.

(**Note:** Y = acceptable growing format)

Format	**>90cm3 cell** **eg V93 Hiko**	**200cm3 Tube**	**Min. 550cm3 container**	**Minimum leaf height** **(mm)**	**Comments**
Baumea articulata	N	N	Y	400mm	
Baumea rubiginosa	N	Y	Y	300mm in >90cm3 cells, 500mm in 200cm3 tubes or >550mm pots	V93 Hiko only suitable for Ephemeral zone Acceptable substitute Baumea arthrophylla
Bolboschoenus caldwellii	N	Y	Y	400	Plants must have grown to 400mm in the container supplied to site before dormancy.
Bolboschoenus medianus	N	Y	Y	400	Plants must have grown to 400mm in the container supplied to site before dormancy.
Carex appressa	Y	Y	N	200	
Carex fasicularis	Y	Y	N	200	
Carex tereticaulis	Y	Y	N	200	
Cladium procerum	N	Y	Y	400	
Crassula helmsii	Y	Y	N	100	
Eleocharis acuta	N	Y	Y	250	
Eleocharis sphacelata	N		Y	400	
Juncus species	Y	Y	N	200	*Juncus amabilis, J flavidus, J gregiflorus, J krausii, J pallidus, J procerus, sarophorus, J usitatus etc.*
Lomandra longifolia	Y	Y		200	
Myriophyllum crispatum	N	Y	Y	250	Plants must be protected from desiccation during transport
Myriophyllum sp	N	N	Y	250	Submerged aquatic *Myriophyllum* sp (eg *M caput-medusae*, *M. salsugineum*, *M. verrucosum*) must be protected from desiccation during transport.
Persicaria decipiens	Y	Y	N	200	
Poa labillardierei	Y	Y	N	200	
Potamogeton ochreatus	N	N	Y	250	Plants must be protected from desiccation during transport
Schoenoplectus tabernaemontani	N	N	Y	400	
Cycnogeton Procerum (syn. Triglochin procerum)	N	N	Y	250	More than 6 leaves and tubers formed on roots.
Vallisneria americana	N	N	Y	300	Plants must be protected from desiccation during transport

Appendix B: Seasonal planting risk

The table below shows months where the conditions most suit the individual species.

Conditions during winter and spring for shallow and deep marsh plants have a higher risk and chance of plant mortality as they are likely to experience extended length of elevated water levels while in they are dormant (not emergent). The risk is also very high for young plants which are more susceptible to drowning.

Some aquatic species have lower growth productivity due to colder conditions with some species such as *Bolboschoenus* sp undergoing winter dormancy. These plants are at risk for longer periods of time if planted in winter as they are not able to take root and support themselves.

Installation of ephemeral species in summer has a higher risk for installation as they are more likely to experience desiccation.

Mitigation strategies must be in place if contractors want to install plants in the higher risk months shown in the table below.

Species	**Planting season**		**Preferred months**		**High risk months**							
	January	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
Baumea articulata												
Baumea rubiginosa												
Bolboschoenus caldwellii												
Bolboschoenus medianus												
Carex appressa												
Carex fasicularis												
Carex tereticaulis												
Cladium procerum												
Crassula helmsii												
Eleocharis acuta												
Eleocharis sphacelata												
Juncus species												
Lomandra longifolia												
Myriophyllum crispatum												
Myriophyllum sp												
Persicaria decipiens												
Poa labillardierei												
Potamogeton ochreatus												
Schoenoplectus tabernaemontani												
Cycnogeton procerum (syn. *Triglochin procerum)*												
Vallisneria americana												

Table 1: Seasonal planting risks for aquatic species

Appendix C: Minimum information to be supplied with deliveries.

1. Nursery name and contact information
2. Project name
3. Date
4. Delivery number (if multiple deliveries to project)
5. Plant species name
6. Origin of genetic material (location)
7. Supply format (cell tray, container etc) quantities per species
8. Plant quantities (including container/cell tray #s) per species
9. Propagation date
10. Dates and details of hardening off/and or acclimatisation processes
11. Nursery QA sign off
12. Photos of nursery batches (to be supplied with final invoice)

Example below:

Delivery docket

Project name & section #		**Supplier**	
EPMS #		**Address**	
Estate name & stage		**Telephone #**	
Delivery Docket #		**Nursery manager**	
Date		**ABN**	
Melways ref:		**Council**	
Asset owner (Melbourne Water or Council)		**Melbourne Water surveillance officer**	
Nursery QA sign off representative		**Nursery QA sign off date**	
Photos of nursery batches (to be supplied			

Species Name	**Planting Zone**	**Propagation date**	**Hardening off/and or acclimatisation processess dates**	**Provenance (Origin of genetic material (location))**	**Quantity required**	**Quantity supplied**	**Format required**	**Format supplied**	**Minimum height requirement met (Y/N)**	**Substitutions**
Baumea articulata	Shallow marsh									
Bolboschoenus caldwellii	Shallow marsh									
Bolboschoenus fluviatilis	Shallow marsh									
Bolboschoenus medianus	Shallow marsh									
Cladium procerum	Shallow marsh									
Eleocharis acuta	Shallow marsh									
Schoenoplectus tabernaemon	Shallow marsh									
Cycnogeton procerum	Shallow marsh									
Baumea articulata	Deep marsh									
Bolboschoenus caldwellii	Deep marsh									
Bolboschoenus fluviatilis	Deep marsh									
Bolboschoenus medianus	Deep marsh									
Cladium procerum	Deep marsh									
Eleocharis sphacelata	Deep marsh									
Schoenoplectus tabernaemon	Deep marsh									
Cycnogeton procerum (syn. Triglochin procerum)	Deep marsh									
Myriophyllum crispatum	Submerged marsh									
Potamogeton ochreatus	Submerged marsh									
Vallisneria australis	Submerged marsh									

Appendix D:

Table 1 Ephemeral batter plant list (NWL to 350mm above NWL)

Botanical name	Common name	Minimum density (>90cm3 container/m2)
Baumea rubiginosa	Soft Twig-rush	6
Carex appressa	Tall Sedge	6
Carex tereticaulis	Basket Sedge	6
Cyperus lucidus	Leafy Flat-sedge	6
Juncus amabilis	Hollow Rush	6
Juncus flavidus	Yellow Rush	6
Juncus krausii	Sea Rush	6
Juncus pallidus	Pale Rush	6
Poa labillardierei	Common Tussock	6
Lomandra longifolia	Spiny-headed Matt-rush	6

Table 2 Shallow marsh plant list (100 to 150mm below NWL)

Botanical name	Common name	Minimum density (plants/m_2) 550cm_3 tube	Fully established plant height (m)
Baumea articulata	Jointed Club-rush	2	1.8
Bolboschoenus caldwellii	Sea Club-rush	2	1.0
Bolboschoenus fluviatilis	Tall Club-rush	2	1.8
Bolboschoenus medianus	Marsh Club-rush	2	1.5
Cladium procerum	Leafy Twig-rush	2	2.0
Eleocharis acuta	Common Spike-rush	2	0.5
Schoenoplectus tabernaemontani	River Club-rush	2	1.8
Cycnogeton procerum (syn. Triglochin procerum)	Water Ribbons	2	1.0

Table 3 Deep marsh plant list (150 to 350mm below NWL)

Botanical name	Common name	Minimum density (plants/m_2) 550cm_3 tube	Fully established plant height (m)
Baumea articulata	Jointed Club-rush	2	1.8
Bolboschoenus caldwellii	Sea Club-rush	2	1.0
Bolboschoenus fluviatilis	Tall Club-rush	2	1.8
Bolboschoenus medianus	Marsh Club-rush	2	1.5
Cladium procerum	Leafy Twig-rush	2	2.0
Eleocharis sphacelata	Tall Spike Rush	2	1.8
Schoenoplectus tabernaemontani	River Club-rush	2	1.8
Cycnogeton procerum (syn. Triglochin procerum)	Water Ribbons	2	1.0

Table 3 Submerged marsh plant list (350 to 700mm below NWL)

Botanical name	Common name	Minimum density (plants/m_2) 550cm_3 tube
Myriophyllum crispatum	Upright Water-milfoil	1
Potamogeton ochreatus	Blunt Pondweed	1
Vallisneria australis	Eel-grass	1