

Leachate Treatment and Disposal Feasibility Study

Concept Drawings
for
Sydney Olympic Park Authority

- Drawings:
- AWC-3-13370-0-Title
 - AWC-3-13370-1-Concept Plan
 - AWC-3-13370-2-Concept Layout Plan
 - AWC-3-13370-3-Schematic Plan
 - AWC-3-13370-4-Typical Sections
 - AWC-3-13370-5-Typical Details
 - AWC-3-13370-6-Planting Plan
 - AWC-3-13370-7-Potential Irrigation Areas

Site Plan (1:1000@A1)



Treatment wetlands area



Potential irrigation areas



Sydney Olympic Park Authority
8 Australia Avenue Sydney Olympic Park NSW 2157

Issued under the Environmental Planning and Assessment Act 1979
Approved Development Application No. 12-10-2014

Granted on the 30/1/15 subject to any conditions
contained in the notice of determination.

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		Australian Wetlands Consulting Pty Ltd Leading Environmental Solutions... WATER - ECOLOGY - MANAGEMENT Suite 101, 42 Midvale St, Australia NSW 2113 Ph: (02) 9284 8188 www.austwetlands.com.au				PROJECT Leachate Treatment Feasibility	DRAWING Title	DRAWING SHEET NO. 11 OF 13 DATE 11/01/15 DRAWN BY: [Name] CHECKED BY: [Name]	SCALE 1:1000	REF. NO.	B
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Concept Plan (1:500@A1)





Sydney Olympic Park Authority
8 Australia Avenue Sydney Olympic Park NSW 2127

Sydney Olympic Park

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Approved Development Application No. 12-10-2014

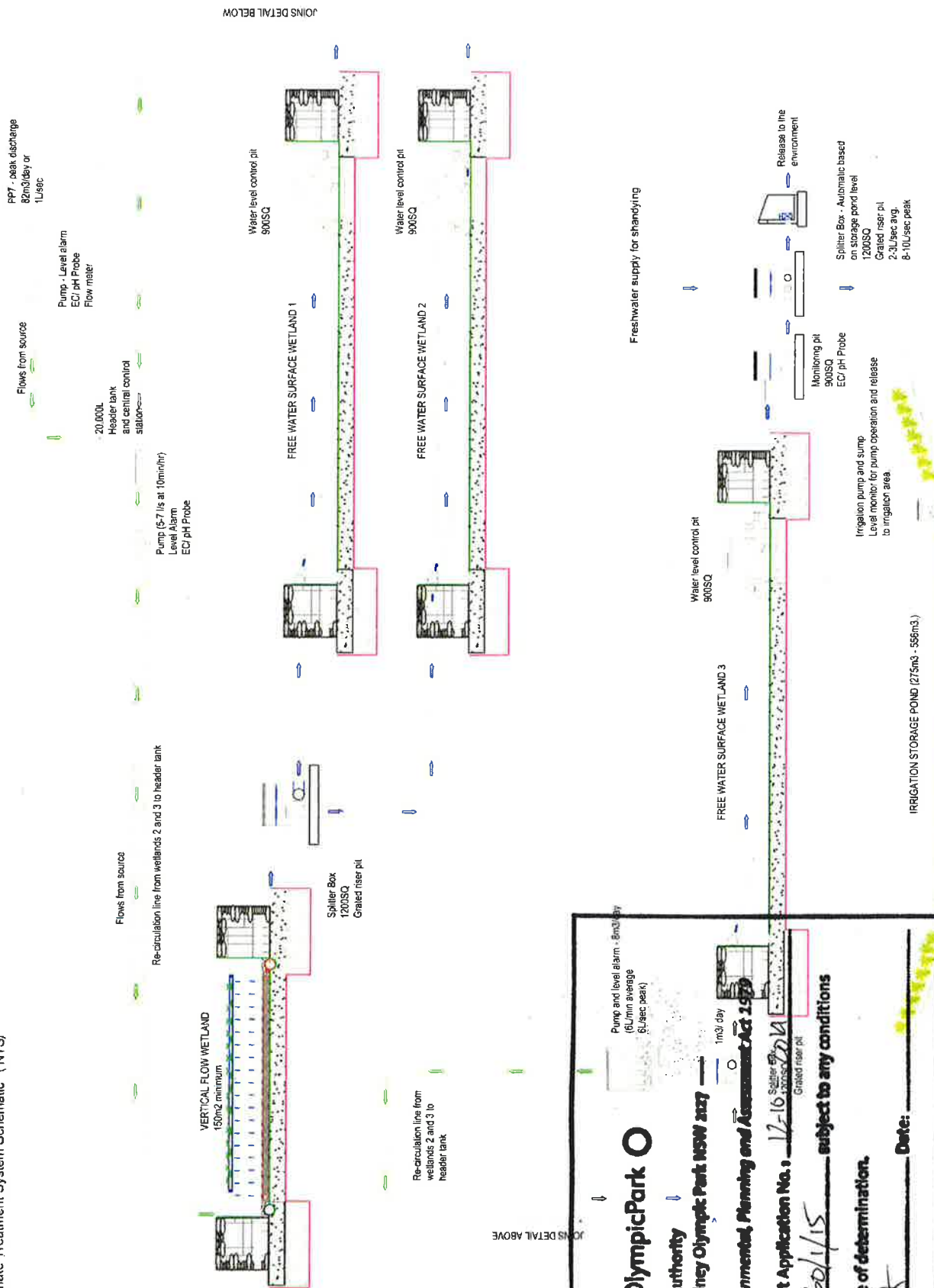
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Leachate Treatment System Schematic (NTS)




Sydney Olympic Park Authority
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Pump and level alarm - 8m³/day
 (6L/min average
 6L/sec peak)

1m³/ day

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Approved Development Application No. 12-16 *Seller City*
 30/1/15 *Travis*

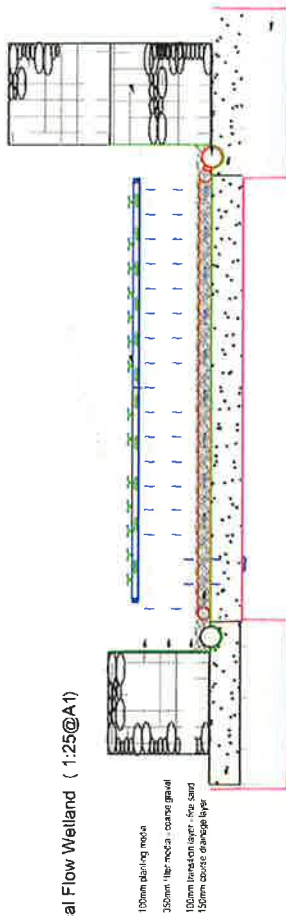
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Section 1 - Vertical Flow Wetland (1:25@A1)



Initial irrigation type Refer to detail Inlet Pipe Layout Plan AWC3-13370-5

1m x 1m x 2m Wire mesh gabions filled with angular granite/ balast minimum size 150mm. Refer to details page AWC 3-13370-6

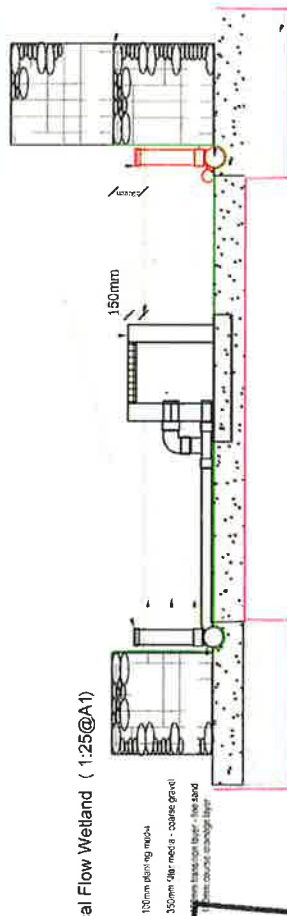
Bentonite/ HDP liner to inside face of gabion and floor of all filters and wetlands. Fix folded top edge of liner neatly to top of gabion using SS cable through eyelets

Primary collection and drainage system

- 100mm solid PVC collection pipe within drainage layer
- 200mm solid PVC collection pipe within drainage layer. Solvent weld all connections and joints

Gabion footing to engineers detail Refer to AWC3-13370-6 for indicative detail

Section 2 - Vertical Flow Wetland (1:25@A1)



Secondary drainage and water level control 900mm sq concrete pit with internal pipe arrangement

200mm dia. inspection and flushing upstands

1m x 1m x 2m Wire mesh gabions filled with angular granite/ balast minimum size 150mm. Refer to details page AWC 3-13370-6

Bentonite/ HDP liner to inside face of gabion. Fix folded top edge of liner neatly to top of gabion

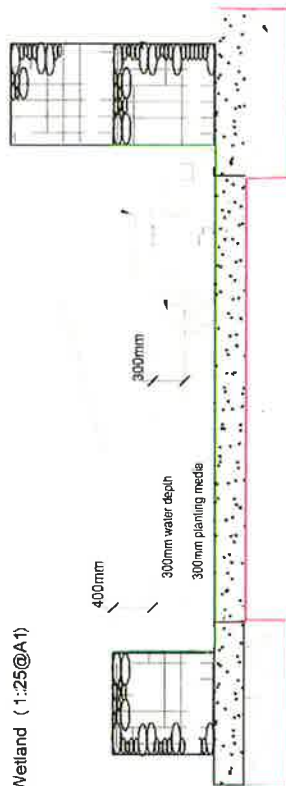
Provide 150mm free board above planting media

Primary collection and drainage system

- 100mm solid PVC collection pipe within drainage layer
- 200mm solid PVC collection pipe within drainage layer. Solvent weld all connections and joints

Gabion footing to engineers detail Refer to AWC3-13370-6 for indicative detail

Section 3 - Free Water Surface Wetland (1:25@A1)



Primary drainage and water level control 900mm sq concrete pit with internal pipe arrangement

100mm perforated pipe, on gravel bed, connected to pit

1m x 1m x 2m Wire mesh gabions filled with angular granite/ balast minimum size 150mm. Refer to details page AWC 3-13370-6

Bentonite/ HDP liner to inside face of gabion. Fix folded top edge of liner neatly to top of gabion

Section 4 - Irrigation Storage Pond (1:25@A1)



Gabion footing to engineers detail Refer to AWC3-13370-6 for indicative detail

1.8m high black chain wire fence to restrict access

100mm planting media

Bentonite/ HDP liner to floor and batters of pond

Sump and pump arrangement for irrigation or storage

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Ph: (02) 9274 9100 Fax: (02) 9274 9101

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PROJECT
Leachate Treatment Feasibility

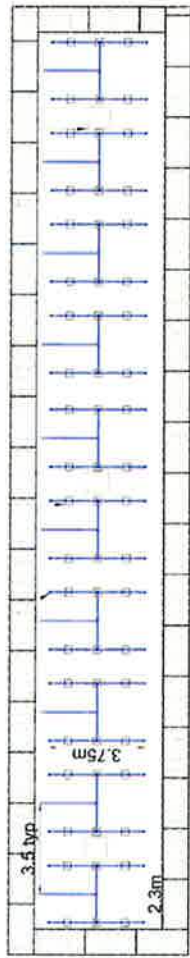
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Typical Section

B

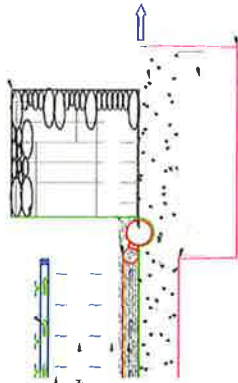
Vertical Flow Wetland - Inlet Pipe Layout Plan (1:50@A1)

50mm PVC pipe laid on top of filter media as indicated in Inlet Pipe Layout Plan. All connection and joints to be solvent welded.
Size and placement of weep holes subject to hydraulic analysis



Provide 500mm x 500mm concrete pavers on available footing to provide support to PVC pipe

900mm x 900mm concrete pit to act as secondary drainage

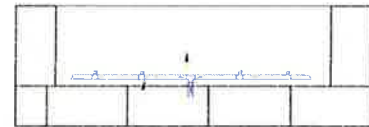


Inlet migration pipe: Refer to detail Inlet Pipe Layout Plan AWC3-13370-5

- 1m x 1m x 2m Wire mesh gabion filled with angular granite/ballast: minimum size 150mm.
- Bentonite/ HDP liner to inside face of gabion and floor of all filters and wetlands. Fix folded top edge of liner neatly to top of gabion using SS cable through eyelets.
- 100mm perforated PVC pipe solvent welded to 200mm collection pipe
- Solid 200mm PVC collection pipe to run length of filter.
- Compacted DGB20/20mm Road base or equivalent.
- 50mm Shot Rock as required to create footing.
- Shot Rock to sit on E-Grid 3030 or equivalent.
- E-Grid 3030 or equivalent to surround entire footing.
- Imported filter material to be laid on compacted road base under over E-Grid 3030

Detail 2 - Inlet Distribution Pipe (1:20@A1)

- 1m x 1m x 2m Wire mesh gabion to end wall of wetlands 1,2 and 3 filled with angular granite minimum size 150mm.
- Bentonite/ HDP liner to inside face of gabion and floor of all filters and wetlands. Fix folded top edge of liner neatly to top of gabion using SS cable through eyelets.
- 100mm solid PVC pipe fixed to gabion with 'T' pieces at 500mm cc
- 50mm - 150mm lightly packed angular granite Shot Rock to be laid on BIDIM A34 geotextile
- 300mm planting media



Secondary Collection Pipes - Black
Overflow pits (x3) drain to 200mm solid PVC pipe

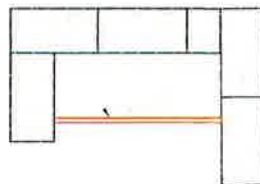
Inspection and flushing upstands



Primary Collection Pipes drain to solid 200mm PVC pipe running along one side of the filter
Inspection and flushing upstands

Detail 3 - Water Level Control Device (1:20@A1)

- 900mm square concrete pit with steel grate drainage pit/water level control
- 100mm perforated pipe across width of wetland to collect flows laid on gravel bed support



- Primary over flow collection pipe
- 100mm dia PVC pipe with threaded 90deg bend to allow for swivel movement to control water level
- Gravel bed under perforated pipe
- Concrete footing as required

- 1200mm square concrete pit with steel grate
- Threaded end caps with appropriately sized holes drilled into it to allow for required flows

Concrete footing as required

SydneyOlympicPark
Sydney Olympic Park Authority
8 Australia Avenue Sydney Olympic Park NSW 2127

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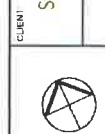
Signed: _____ Date: _____
Pipe to Wetland 1 e.g. _____
Pipe to Wetland 2 e.g. _____



Australian Wetlands Consulting Pty Ltd
Creating environmental value
WATER - ECOLOGY - MANAGEMENT
Ph: 02 927 2373 Fax: 02 927 2374
www.australianwetlands.com.au

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NO.	DATE	REVISIONS	BY	CHKD	DATE	REVISIONS	BY	CHKD
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2	15/11/14	Issue for tender	AWC	AWC	15/11/14	Issue for tender	AWC	AWC

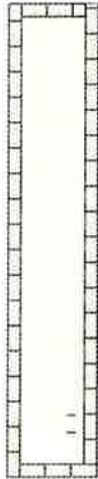


PROJECT
Leachate Treatment Feasibility

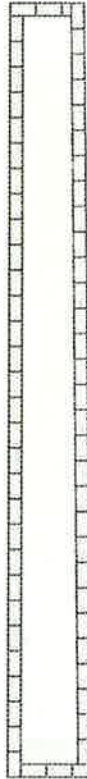
DRAWING
Typical Details

SCALE
DRAWN BY
CHECKED BY
DATE
REV. 8

Vertical Flow Wetland - Area = 150m²



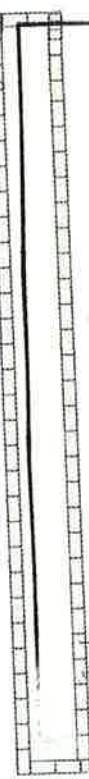
Wetland 1 - Area = 200m²



Wetland 2 - Area = 200m²



Wetland 3 - Area = 200m²



Vertical Flow Wetland Area = 150m²

Sydney Olympic Park Authority

Australia Avenue Sydney Olympic Park NSW 2127

Approved under the Environmental, Planning and Assessment Act 1979

Approved Development Application No. 12-10-2014

Granted on the 30/1/2015 subject to any conditions

Area	m ²	Plant Species	Plants / m ² Size	Numbers
Vertical Flow Wetland	150	Schoenoplectus validus	8 Hiko	1200
Wetland 1	200	Schoenoplectus validus	8 Hiko	800
Wetland 2	200	Schoenoplectus validus	8 Hiko	800
Wetland 3	200	Schoenoplectus validus	8 Hiko	800
Storage Pond (Batters only)	140	Phragmites australis	6 Hiko	840
Feature Planting		Acmena smithii Minor	NA	45
		Casuarina alba	NA	45
Total				6930

PLANTING NOTES

Wetland plants
One sufficient notice to full irrigation may be made at the following stages:
- Slope-grades cultivated or prepared for planting (topsoil)
- Planting area set out
- Completion of planting establishment work

Wetland Imported Top Soil
Provide 100mm (Storage Pond) and 300mm (Wetlands 1, 2 and 3) depth of imported top soil. Barelychips and mulch should be applied to the topsoil. The topsoil should be applied to the topsoil in a line even if free of rocks, branches. Allow the topsoil area to settle for one week prior to planting and lightly roll. Top up any settlement and bulk out any subsided areas.

Vertical Flow Filter Media
The specification of the filter media is extremely important. The table below displays a list of specified media for the filter.

Media	Quantity	Notes
Imported planting media	1000m ³	Imported planting media 8 per requirement 50% x 50mm and 50% x 100mm
Filter media	3000m ³	Coarse gravel hydraulic conductivity of 100-500mm per hr
Filter media	1000m ³	Coarse sand
Filter media	1000m ³	Coarse sand
Filter media	1000m ³	Coarse sand
Filter media	1000m ³	Coarse sand
Filter media	1000m ³	Coarse sand
Filter media	1000m ³	Coarse sand
Filter media	1000m ³	Coarse sand
Filter media	1000m ³	Coarse sand

PLANTING
Plant materials
Quantity As per drawings

Pre-planting
The contractor shall be responsible for ensuring that all plant material is available to sites and species type nominated in the plant schedules. For specimens in large quantities this will ensure the pre-planting and growing on of species by a dedicated nursery for an extensive period of time prior to their installation and delivery to the site. The contractor shall ensure that the plant material is delivered to the site by the Landscape Architect. No substitution of species or sizes will be accepted unless given in writing by the Landscape Architect or Site Superintendent.

Plants
Plant species - refer to table
General: Provide provenance plants with the following characteristics:
- Large healthy root systems with no evidence of root collar rot, resprouting or damage
- No evidence of pest or disease
- No evidence of any other damage caused to any item of the work by the flow or passage of water on or through the site, filter or wetlands.
- Requirement of any portion or item of the work which has deteriorated or no longer conforms to the Specification.
A monthly report detailing maintenance activities should be submitted to the Superintendent throughout the maintenance phase.

Maintenance and Monitoring of Plant Establishment
The establishment phase is important because juvenile plants need to be protected until they become tolerant of local conditions. This phase generally covers a 24 month period from the time of planting. The most important activities required during the establishment phase include:
- Weeding
- Mounding of plant establishment and growth
- Weeding control
- Plant protection
- Restriction of public access
These same horticultural and ecological principles apply in the event that any additional or replacement planting is undertaken. Plants must be monitored during the establishment phase until they are robust and self-sustaining. During early establishment phases visually assess or until it is determined that the system is functioning as designed. Hand remove all unwanted plant material for the duration of the maintenance period.

Replanting
The following list summarizes the replanting techniques:
1. Dig a hole twice the size of the plant root-ball using a shovel, not a hand tool.
2. Dig the plant in so that the top of the root-ball is slightly below, or level with, the surrounding soil.
3. Backfill the hole and firm down the surrounding soil to ensure there is complete contact between the roots and soil, and that plant is held easily, dislodged by water flow, wind or wave action.

Predation Monitoring
Monitoring of plant establishment, roots and spread on, can cause serious damage to new plantings if large populations are caused or attracted to the site. As well as the above, the contractor should establish, grazing and nesting activities can sometimes damage established vegetation stands.

Planting notes continued
creating and maintaining gaps in the plant cover. Potential bird predation makes rapid establishment essential, an industry and robust plant cover will generally resist and accommodate some predation.

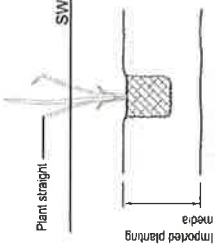
During initial plant establishment regular inspections of waterflow and other pests is required, especially in the weeks following initial planting. Checking for signs of predation. If birds remove seedlings, then replant with larger plants or transplant clumps of well-established plants. Other options include nesting scare tactics and distraction feeding, as well as maintaining appropriate water levels that discourage the foraging activities of many species of waterfowl.

Experience has shown that the best way to ensure successful plant establishment is to establish a separate Planting and Aftercare Contract, whereby an experienced plant contractor is engaged to take responsibility for the planting and post-planting maintenance. The level of plant establishment should be based on pre-defined criteria as specified in the terms of the contract, such as percentage coverage with desirable species, absence of problematic weeds and absence of un-vegetated areas larger than a set size.

Inset and Output Monitoring

Inset and Output Monitoring
Inset and output monitoring of all systems require careful monitoring. Successful plant establishment is essential, an industry and robust plant cover will generally resist and accommodate some predation. Juvenile plants do not like to be mounded for long periods of time, as this can cause rot and damage to the plant. Once the plants have established water levels can be brought up to operational levels.

Macrophyte Planting Detail
NTS



Hardwood stakes x2
40mm x 40mm x 1800mm
50mm wide has an 18

75mm deep mulch around base of tree. Form shallow dish at tree base

Cultivate sub-grade around root ball

Boboschoenus caldwellii



Schoenoplectus validus



Phragmites australis



Casuarina alba



Acmena smithii Minor





LEGEND

- PREFERENCE 1 - 15,740sqm
20m Exclusion Zone to Boundary Creek
- A+B PREFERENCE 2 - 6,875sqm
Planting changes may be required
- PREFERENCE 3A - 5,520sqm
PREFERENCE 3B - 4,320sqm
Change from turf to planted areas

NOTE: A detailed soil investigation is required to determine if site soils are suitable for irrigation and any mitigation requirements that may be necessary



Australian Wetlands Consulting Pty Ltd
Leading environmental solutions.
WATER - ECOLOGY - MANAGEMENT
SUITE 201, 55 WEDGE ST, AUSTRALIA NSW 2153
PH: (02) 421 1158 WWW.AWCPTD.COM.AU

CLIENT Sydney Olympic Park

PROJECT Leachate Treatment Feasibility

POTENTIAL IRRIGATION AREAS

DATE: 12/11/15
SCALE: 1:10,000
DRAWN: J. BROWN
CHECKED: M. JONES
APPROVED: P. SMITH