Construction Soil Water & Leachate Management Plan

For
Woodlawn Bioreactor Leachate Treatment Plant

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QUALITY INFORMATION

Document Revision Register

Rev	Revision Details	Prepared by	Review By	Authorised By	Date
1	Initial draft for internal review				
	Signatures				
2	Final draft for submission to DPE				

Contents

Definitions/Abbreviations

Bioreactor	Woodlawn Bioreactor
COC	Conditions of Development Consent
DA	Development Application
DPE	Department of Planning and Environment
DPI Water	NSW Department of Primary Industries – Water
EA	Environment Assessment
EP&A	Environmental Planning and Assessment (Act and Regulations)
EPA	NSW Environment Protection Authority
EPL	Environment Protection Licence
ERP	Emergency Response Plan
NIMS	National Integrated Management System
POEO	Protection of the Environment Operations (Act and Regulations)
RIVO	Incident and Compliance Management System
SWLMP	Soil Water & Leachate Management Plan
TADPAI	Tarago and District Progress Association Incorporated
Veolia	Veolia Australia and New Zealand
WHS	Work Health and Safety (Act and Regulation)

Section 1 Introduction

This Construction Soil, Water and Leachate Management Plan (SWLMP) has been prepared as a guide for (i) effective erosion and sediment control; (ii) conservation of water quality; and (iii) management of surface and storm water during the construction stage of the LTP, in accordance with relevant regulatory conditions.

No groundwater disturbance is anticipated during the construction works and therefore management and monitoring of this parameter has not been addressed in this Plan. If any contamination is detected, the management practices detailed in the Construction Site Contamination Management Plan (CSCMP), appended to the Construction Environmental Management Plan (CEMP).

No leachate generation is anticipated either in the construction stage of the LTP and therefore monitoring and controls of such has not been addressed in this SWLMP, other than construction of the leachate management infrastructure. Once the Facility is constructed and commissioned, this Plan shall be updated to include all relevant details to the operational management of leachate.

The SWLMP details the earthwork activities, water balance for the site, water quality monitoring, maintenance and controls .

The guidance provided in the following documents has also been taken into consideration in this plan:

- Managing Urban Stormwater: Soils and Construction 4th Edition (Landcom, March 2004);
- Managing Urban Stormwater: Harvest and Reuse (EPA, April 2006);
- Managing Urban Stormwater: Council Handbook - Draft (EPA, November 1997);

Section 2 Goals of the SWLMP

2.1 Objectives

The objective of the SWMP is to ensure that there is minimal impact on soils, surface water and groundwater systems from the operations at the Bioreactor.

The key goals of the SWMP are to:

- Provide a comprehensive soil and water management plan for the LTP during its construction stage;
- Provide a practical and logical staging program for the implementation of erosion and sediment control measures;
- Limit the area of land disturbance necessary to construct the LTP;
- Protect water quality, by preventing sediment laden storm and surface water from sensitive receptors;
- Prevent surface water pollution from surface discharges of any contaminated water from the LTP;
- Provide rehabilitation for disturbed areas; and
- Comply with the relevant regulatory requirements.

2.2 Responsibilities

Responsibilities for the implementation of the SWLMP are summarised in Table 2.1.

Table 2.1 Summaries of Responsibilities – SWLMP

Actions	Responsibility
Overall implementation of the SWLMP	Construction Manager and Contractor
Implement methodology for managing disturbed soil and water management.	Construction Manager and/or Contractor
Induct site personnel on the site safety and environmental requirements of the SWMLP prior to commencing any work on site, develop specific Work Methods, carry out Job Specific Safety Analysis and create Permits to Dig for each new excavation activity to track material movements.	Construction Manager and/or Contractor
Coordinate site environmental monitoring, compile reports and maintain internal records	Environmental Management Representative (EMR) or nominee
Identify and /or notify any reported Environmental non conformances if and when they occur for corrective action and confirm methods to mitigate impacts	Construction Manager and/or Contractor and EMR or nominee
Authorise, confirm and implement mitigation and/or rectification measures	Construction Manager and EMR with Contractor

Section 3 Soil Management

Where practical, land disturbance will be minimised to reduce the soil erosion hazard on site. This section provides the primary actions required to minimise land disturbance. In the event any disturbance to the land results in the detection of contaminated material, the management of this will be in accordance with the recommendations provided in the CSCMP, appended to the CEMP.

Table 4.1 Limitation to Access

Land Use	Limitations	Comments
Construction Areas	Disturbance to be no further than the allocated boundary of any essential construction activity as shown on the engineering plans	All site workers should clearly recognise these zones that, where appropriate, are identified with barrier mesh (upslope) and sediment fencing (down slope), or similar materials.
Access Areas	Limited to the maximum width that shall be specified prior to commencement of construction works.	The location of the access areas and the associated stabilised entry/exit points shall be determined by the Contractor in conjunction with Veolia. All site workers should clearly recognise the boundaries, which, where practical, are marked with a barrier fence.
Remaining Lands	Entry prohibited except for rehabilitation work.	All site workers clearly recognise this land by marking boundary with barrier fence.

Notes:

1 Where practical, the soil erosion hazard on the site will be kept as low as possible. Disturbance of the existing soils will be limited to that which is absolutely necessary.

2 Clearly visible barrier fencing shall be installed prior to commencement of construction to minimise unnecessary site disturbance and to ensure control of construction traffic. Vehicular access to the site shall be limited to only those essential for construction work and they shall enter and exit the site only via the access way and through the stabilised entry/exit point as determined prior to commencement of construction.

3 Where possible, any excavated fill material will be retained and reused on site.

4 The duration of all works, and thus the potential for soil erosion and pollution, should be minimised.

5 Where practical, foot and vehicular traffic will be kept away from disturbed area

Section 4 Site Water Balance

A water balance has prepared to describe the source of water collected or stored at the LTP, as well as the likely site demand and discharge limits. This information has been used to design and construct the LTP infrastructure that will be employed on site to (i) achieve the treatment and storage capacity; (ii) comply with regulatory requirements and (iii) sustain onsite water usage during the LTP operation stage, while minimising the use of potable water.

The proposed operational water management infrastructure shall comprise of

Buffer Tank (1800m^3)

2 Anoxic Tank (225m^3)

2 Aeration Tanks (1100m^3)

located strategically around the LTP Facility.

An estimate of the water demand during the construction stage of the LTP has only been calculated for the likely potable water demand for site personnel. Water usage for other construction activities such as dust suppression, plant and equipment wash down waters and general cleaning will be subject to weather conditions and/or site needs.

The following supply and outputs describe the flow of water into and out of the LTP both during the construction, where relevant, and operation stages.

4.1 Supply

- Two sources of water will be used to supply the LTP during its construction stage: potable and non-potable water.
    - Potable water, sourced from the Willeroo Borefield will be reticulated to sanitary and safety facilities for operational employees to utilise. Veolia has a licence to draw water from the Willeroo Borefield for operational purposes.
    - Non potable water shall be sourced from the Woodlawn Dam, a raw water dam, located at the Eco Project Site, for use as process water during the construction stage of the LTP, as dust suppression or wash down.

- Where possible, recycled water or wastewater generated as part of onsite activities shall be utilised in some of the processes to supplement process water supply. The fire fighting system will also be constructed to be supplied from the process water.

4.2 Outputs

- Two types of wastewater shall be generated from the LTP during its construction stage, namely sewage and process wastewater.

- sewage generated from the sanitary facilities shall be transferred to a sewage treatment plant;
- The process wastewater generated during the construction stage shall include dust suppression water, plant and equipment wash down waters and general cleaning waters.

- Any 'clean' stormwater that has not come into contact with construction activities, shall be diverted to either the natural surface water drainage culverts or an appropriately located sump.

4.3 Water Usage

- Requirements for potable water have been estimated based upon the number of personnel on site and the range of activities that they undertake.

  - This may include an allowance of 50 litres (L) per shower and 25 L per person per day for all other potable water usage (hand washing, kitchen usage, drinking and sanitary facilities) was assumed.
  - Based on the sanitary and safety requirements at the LTP, an average total potable water demand and usage was calculated to be 2.1 m3/day or 0.8 ML per year for the duration of the construction stage.

- Potable or non potable water usage for process water requirements during the construction stage of the LTP will be subject to site demands and weather.

As no groundwater ingress is anticipated once operations of the LTP commences, this parameter was not considered in the preparation of the water balance.

Section 5 Erosion and Sediment Control Plan

In accordance with regulatory requirements, the Erosion and Sediment Control Plan (ESCP) for the construction phase of the LTP has been prepared to detail the following:

- Identification of construction activities on site causing soil erosion and generating sediment;
- Implementation of measures to minimise soil erosion and transport of sediment downstream of the LTP during its construction phase;
- Identification of the location, function and capacity of any erosion and sediment control structures; and
- Maintenance of structures overtime.

The following erosion and sedimentation control structures will be used on site during the construction of the LTP and are described in the following sub sections:

- Stabilised entry/exit point;
- Sediment filter fences;
- Barrier fences;
- Stockpiles; and
- Other site controls (as needed)

5.1 Stabilised Entry/Exit Point

- A stabilised entry/exit point will be established to reduce the likelihood of vehicles tracking soil materials onto the site access way and public roads.
- The nominated point is to be kept clean of any loose material by regular sweeping and cleaning.
- It is important to note that all vehicles entering or leaving the site will not be tracking across any excavated areas unnecessarily.
- In the unlikely event of spillage on public roads as a result of site construction activities, the area will be cleaned immediately.

5.2 Sediment Filter Fences

- Sediment filter fences shall be installed, as required, around the perimeter of areas where the LTP is to be constructed, with the use of star pickets and filters to intercept water.
- The filter fences will be checked after each storm even for damage or clogging by silt or debris and appropriate maintenance and/or repair actions taken.
- Placement of gravel along the filter fences, to prevent breakthrough of non captured water under the filters, may also be utilised along with hay bales, secured in place to support the fence.

5.3 Barrier Fences

- Barrier mesh fences may be installed, as required, to prevent access and avoid unnecessary soil/land disturbance.
- Prior permission from the Construction Manager may be required before entering any of these areas.

5.4 Stockpile Management

- Stockpiles will be constructed away from areas of drainage flows, as and when required.
- Stockpiles will be minimised through effective management of excavated or incoming fill material.

5.5 Other Site Controls

Other site controls to be employed may include:

- Gravel and filter meshes as required, to minimise potential sediment movement off site;
- Receptacle bins will be provided for any lightweight litter. Clearance services will be provided as required;
- Any concrete and mortar slurries are to be collected and stockpiled at designated locations on site for incorporating into fill areas of the site or disposal into the Woodlawn Bioreactor.
- Washout of concrete agitators (if necessary) is to be undertaken only in areas nominated by the Construction Manager;
- Any material removed during site stripping and grubbing works will be disposed of in an appropriate manner in the Woodlawn Bioreactor, if not suitable for reuse;
- Temporary soil and water management structures will be removed only after the lands they are protecting are stabilised;
- Monitoring of the collected stormwater shall be undertaken to ensure the discharge quality does not adversely impact sensitive receptor

Section 6 Stormwater Management

The Stormwater Management (SM) has been prepared to describe the capture and storage of all rainfall and storm water runoff from areas of the LTP during its construction stage.
The LTP shall be maintained as a zero discharge site during its construction stage

The effectiveness of the SM is dependent on the following key parameters:

- Erosion and sediment control;
- Segregation and management of 'clean water' (non sediment laden or process waters) and 'dirty' water (i.e. process/wash waters) runoff;
- Provision of adequate on-site detention for the construction activities; and
- Water quality control.

6.1 Erosion and sediment control

- Erosion and sediment control as part of the construction phase of the LTP is detailed in Section 5 of this SWLMP.
- Impacts from erosion and sedimentation will be minimised during the operation phase of the LTP as a significant portion of the site shall be sealed with a raised hardstand.

6.2 Water segregation and quality control

- The stormwater management of the LTP during its construction stage will be designed to deal with run-of generated under a range of conditions;
- Segregation and management of 'clean' and 'dirty' water shall occur with appropriately installed temporary water management infrastructure such as diversion drains, sumps and/or storages.
- The treatment devices selected for stormwater management during the construction stage of the LTP should be effective in capture of sediment and gross pollutants, where necessary, as well as have capability for oils/greases and fuel spills.
- Water quality control shall be achieved by monitoring and maintenance of these infrastructures as detailed in Section 7 of this SWLMP.

Section 7 Water Quality Monitoring Program

The monitoring program for the LTP during its construction stage has been prepared, in accordance with the relevant regulatory and best practice industry guidelines, .

7.1 Monitoring Parameters

Monitoring of key water quality parameters shall assist in the verification and management of water infrastructure performance. These parameters may include:

- Stormwater quality for reuse on site (as required);
- Stormwater quality following rain events or discharge (as required);
- Surface water quality (quarterly or as required)

As no access to groundwater is anticipated during the construction or operation stage of the LTP, a groundwater monitoring program will not form part of the Construction or Operation EMS.
The generation of leachate is also not anticipated during the construction phase of the LTP and therefore does not form part of the CEMS

Section 8 Response Plan

In accordance with the regulatory conditions, a response plan is required for receiving water bodies to:

- Include a protocol for investigation, notification mitigation of any exceedances of the respective trigger levels; and
- Describe the array of measures that could be implemented to respond to any surface or groundwater contamination that may be caused by the development.

Groundwater and leachate response plans have not been addressed as part of this Plan as neither is anticipated to be impacted during the construction stage of the LTP.

8.1 Monitoring

- Monitoring, as required and detailed in the Section 7, during the construction stage of the LTP will enable the identification of any potential impacts to surface water receivers as a result of the activities being undertaken.
- Sample results will be compared statistically with the established baseline water quality data.
- The results of the monitoring program, any exceedances and/or corrective actions required shall be collated into a report, along with recommendations for future monitoring regimes.

8.2 Non Conformance and Corrective Actions

In the event that an exceedance is detected, such as analytical results are elevated above target criteria that will be determined in the baseline establishment, further investigation shall be undertaken consisting of (i) re-sampling duplicates to check accuracy of results, (ii) monitoring at additional locations and (iii) analysis of additional parameters may be required to further characterise the pattern of discharge of contaminants from the LTP Facility.

If the results of this assessment suggest that contamination is occurring from the site then corrective action could comprise one or more of the following:

- Report any contaminated discharges to the relevant regulatory authorities;
- Install bunds to collect the polluting substance(s), if and where necessary;
- Assess whether any other sources of contaminated sediment or water is entering the system or check results against Woodlawn Bioreactor surface water monitoring data to assess risk to the receiving waters;
- If no contamination is found, the Contractor's standard clean up techniques, developed in consultation with Veolia, shall be followed;
- If contamination is found, a corrective action plan should be developed in consultation with Veolia. Further details for managing contamination incidents are provided in the CSCMP appended to the CEMP.

Section 9 Implementation of the SWLMP

9.1 Auditing and Reporting

An auditing program shall be established during the construction stage of the LTP to ensure effective implementation of the SWLMP.
The Contractor or site nominee shall adopt the following management practices (i) at least weekly, (ii) immediately before site closure and (iii) immediately following significant rainfall events, including but not limited to:

- Inspection of all sediment and erosion control measures as a quality check of their installation and maintenance;
- Recording the condition of every soil and water management practice employed;
- Recording maintenance requirements (if any) for each soil and water management practice;
- Recording where site sediment or process water is collected and disposed; and
- Provide the results of the audit to the Construction Manager.

9.2 Inspection

The Contractor or site nominee will inspect the site, providing particular attention to the following matters:

- Ensure the site is cleaned of any loose materials such as soil, sand and debris (or other materials) that may be a source of sediment or pollution.
- Construct additional erosion and/or sediment control works as might become necessary to ensure the desired protection is given to down slope lands and waterways.
- Remove trapped sediment from upslope of sediment fences and bales.
- Maintain erosion and sediment control measures in a functioning condition until all construction and other activities are completed and the site is rehabilitated.
- If any runoff is accidentally bypassing the sediment control structure, rectify immediately by diverting runoff to function as intended.
- Remove temporary soil conservation structures as a last activity in the rehabilitation program.

9.3 Recording

The Contractor or site nominee will keep the following records:

- Weather conditions (such as rainfall and wind speed/direction), if any.
- The condition of any soil and water management works.
- Any corrective actions or remedial works undertaken.

All records entered will be kept on-site and made available to the Construction Manager on an ongoing basis, as well as to the relevant authorities and/or any other authorised person on request.