

ENVIRONMENTAL MAINTENANCE MANAGEMENT PLAN



TOOLKIT & GUIDELINE DOCUMENT FOR OPERATIONAL STAFF

Version 0
October 2025

ENVIRONMENTAL MAINTENANCE MANAGEMENT PLAN (eMMP) GUIDELINE DOCUMENT FOR OPERATIONAL STAFF

This document was created to assist contractors complying with the eMMP. It contains details on the roles and responsibilities of various individuals together with specific details to be followed by the Operational staff at different stages throughout the project.

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Abbreviations

CON	Contractor
EC	Environmental Consultant
ECO	Environmental Control Officer
eMMP	Environmental Management Plan
SECO	Site Control Officer
DEDEAT	Department of Economic Development and Environmental Affairs and Tourism

1. Introduction

This document summarises the main issues that a contractor and/or LSRWUA Maintenance Staff must comply with to ensure that the requirements of the Environmental Maintenance Management Plan (eMMP) are met. The purpose of this document is to ensure the compliance with the eMMP by highlighting the eMMP's most significant features. Therefore, this document was developed for use by the site staff and subcontractors to implement sustainable environmental management practises for all maintenance work required.

1.1 Background

In 1998, the **National Environmental Management Act (NEMA)** (Act No. 107 of 1998) was promulgated by the National Department of Environmental Affairs.

On 4 December 2014 the regulations pertaining to environmental impact assessments under sections 24(5), 24M and 44 of NEMA were published in Government Gazette 10328 Notice Number 594. In terms of the regulations construction work **may not commence** without DEDEAT approval in following circumstances:

- **Work in a river/stream (with or without water) or 32m from such a river/stream**
- **Wetland or 50m from a wetland**
- **Clearing of any vegetation (even grass) of more than 10m²**

Therefore, any project that involves these activities must have an Environmental Impact Assessment (EIA) process and be approved by the provincial authority, the Department of Economic Development, Environmental Affairs and Tourism (DEDEAT) before construction can start. DEDEAT decides whether or not the project can go ahead and issues an Environmental Authorisation (EA) in which they may attach certain conditions to the approval of a project. Including a Maintenance Management Plan (eMMP).

This eMMP aims to protect the environment during construction activities. Please note that the term “environment” is meant in its broadest sense, and includes plants, animals, people, buildings, houses, cars etc. and is not just “the plants and animals” (Figure 1).

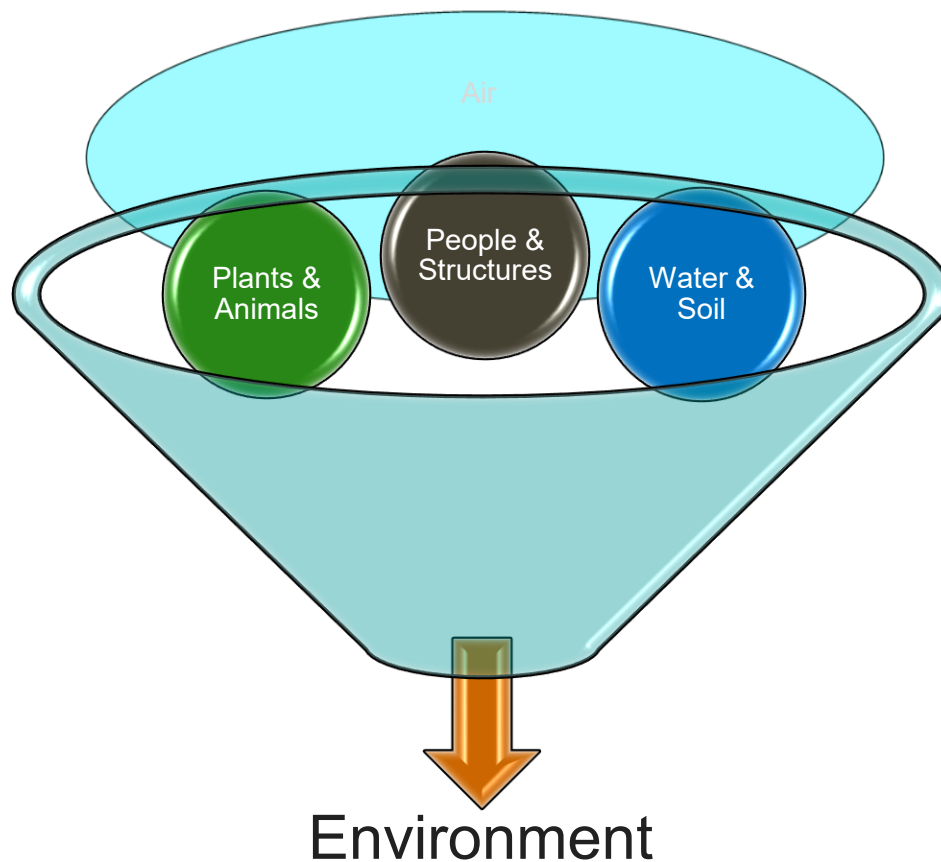


Figure 1: All aspects of the term environment.

2. Roles and responsibilities relating to the implementation of the eMMP

2.1 Organogram

Below is a figure illustrating the organization for construction plans (Figure 2). The environmental consultant/control officer reports to the Client's Agent and the Client's Agent's representative who then reports to the contractor. This is the usual line of formal communication however this does not mean that communication may not be directly between the contractor and the environmental consultant.

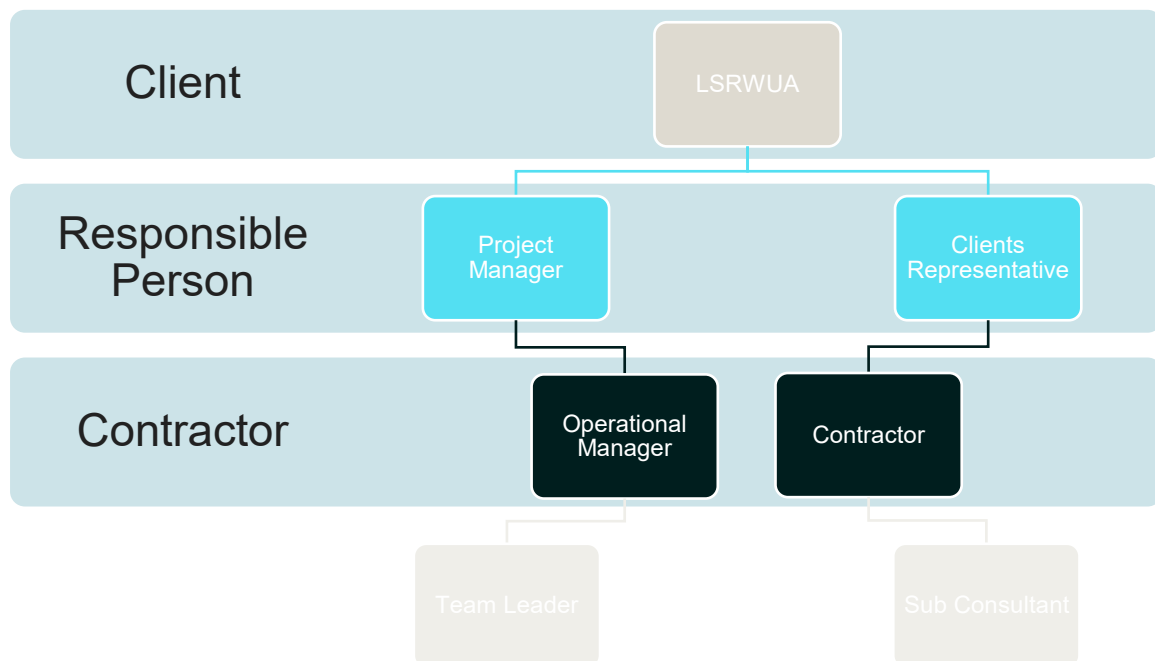


Figure 2: Organogram for construction.

2.2 Project Manager and Client's Agent

The role of the Project Manager/ Client's Agent is to monitor and ensure that the site staff complies with the eMMP. The client's Project Manager/ Client's Agent will keep written and photographic records of activities, progress and non-compliances for future reference. This is also valuable if future disagreements on environmental compliances arise. Environmental Officer (EO) will be responsible for monitoring, reviewing and verifying compliance with the eMMP by the Contractor. These parties will keep a written and photographic record of activities, non-compliance and corrective action with regards to the eMMP.

2.3 Contractor

The contractor should comply with the requirements of the eMMP and abide by the Project Manager/ Client's Agent instructions. This will include the submission of method statements prior to commencement of construction activities for approval by the Client's Agent and the environmental consultant. Furthermore, the contractor is required to establish and maintain an environmental awareness course for his employees to the degree that all workers and sub-contractors have attended this course prior to the commencement of construction and any future employees attend this course before entering the construction site.

Section 3 details some of the main actions required for the eMMP by the Contractor, before construction, at initial start-up and during construction. The PM/ER and EO will ensure that all of these actions are undertaken timeously and in accordance with the eMMP.

2.4 Environmental Officer

The Environmental Officer's responsibilities will be to undertake a daily site inspection to monitor compliance with the eMMP. The Contractor shall forward the name of the Environmental Officer to the ER for his approval, prior to the onset of the Environmental Awareness Course.

A daily checklist has been included in Annexure G to facilitate the daily site inspection by the Environmental Officer. These completed checklists must be submitted to the DEDEAT and Project Manager and are to be taken seriously by the contractor. The transgressions that will attract fines are listed in the detail specification.

2.5 Environmentally friendly products

Annexure I contain a list of suppliers who advertise environmentally friendly products and which have been used successfully in practice. It should be noted that this list is by no means exclusive, and that other bio-remediation measures and environmentally friendly products should also be investigated.

2.6 Penalties

Penalties are in place to ensure compliance with the eMMP and to discourage shortcuts. Non-compliance constitutes a breach in contract and may be dealt with by penalties or removal of the contractor from site and the suspension of work.

2.7 Scientific monitoring

Scientific monitoring may be required in cases where construction is in close proximity to sensitive environments. Marked changes in natural environments may result in suspension of activities until the cause of the problem has been determined and remedied.

3. Main actions required by the contractor for compliance with the eMMP

This section aims to ensure that these main actions are not overlooked, and unnecessary delays do not result, by ensuring that Site Staff are aware of these requirements ahead of time.

It must be noted, however, that this section does not list all the requirements of the eMMP, but rather serves as a guide as to where definite actions are required before certain activities can commence. The section relates to the Standard eMMP and should therefore be read in

conjunction any Project Specifications. In addition, Figure 3 summarises the actions required by the various organisations to ensure that the eMMP is implemented correctly from the start a project.

In addition, Annexure C contains additional issues deemed to form part of the eMMP.

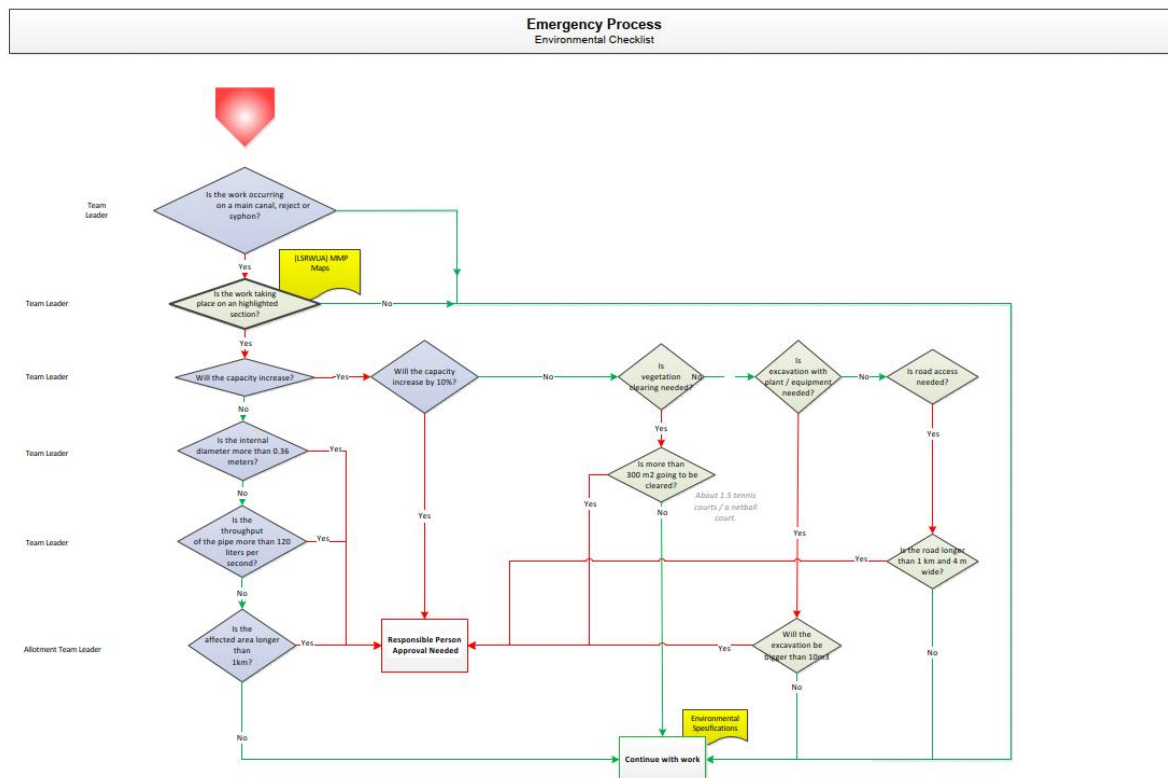


Figure 3: Actions required by the various role-players to ensure that the eMMP is implemented correctly.

3.1 Prior to commencement

3.1.1 Work Orders

Work Orders that are required during construction will be issued to the Site staff as part of this document. Where applicable (such as for a river crossing), the contractor shall induct workers who will be engaged in activities where Work Orders have been issued.

3.1.2 Method statements

A method statement is a written submission setting out the methods to be used to carry out an activity. These method statements are compiled by the contractor for the approval of the Client's Agent and the environmental consultant to comply with the specifications. These method statements are legally binding and non-compliance may result in penalties.

Method statements that are required during construction must be submitted to the Client's Agent at least 20 days prior to the commencement of the proposed activity. Where applicable (such as for a river crossing), the contractor shall induct workers who will be engaged in activities which require method statements.

Method statements will include:

- construction procedures;
- materials and equipment to be used;
- transport, to and from, as well as within the construction site;
- storage of equipment and materials;
- actions to be taken in the event of hazardous spills and;
- timing and location of activities.

See Appendix F for the template for the Method Statement.

All activities which require method statements may only commence once the method statements have been approved by the Client's Agent in consultation with AES.

3.1.3 Environmental awareness course preparation

The contractor shall organise and finalise the logistics and date of the Environmental Awareness Course with the Client's Agent before the commencement date. A method statement is required to this effect.

3.1.4 Identification of rare, endemic or endangered species

Prior to clearing and grubbing the necessary arrangement are to be made either with LSRWUA Environmental Department or with the ECO to identify and mark rare species. All marked species are considered no-go areas. If required, the removal of fauna and flora from site must be performed prior to the commencement of any work on site. A qualified horticulturist must be appointed as sub-contractor for this purpose.

3.1.5 Demarcation of the site

Where required, one of the first actions to be undertaken by the contractor shall be to erect and maintain a temporary fence along the boundaries of the site, and around any no-go areas, to the satisfaction of the Client's Agent. Areas outside of the demarcated construction area must not be damaged or used for any construction-related purposes.

3.1.6 Environmental awareness course

The contractor shall ensure all staff attended an environmental awareness course as part of the induction process.

The contractor shall also be responsible for ensuring that the information presented at the course along with the requirements in the eMMP is presented to the rest of his/her staff including all labour and mechanical staff as well as to sub-contractors and their staff. During construction, if new personnel will be coming onto site, the contractor shall be responsible for providing awareness training and thus ensuring that these personnel are aware of the environmental specifications on site.

3.2 During the construction period

3.2.1 Copy of the eMMP and familiarization thereof

A copy of the eMMP, Works Orders and relevant project specification, along with the any contract documentation, shall be available on site. The contractor shall ensure that all the personnel on site (including sub-contractors and their staff) as well as suppliers, are familiar with and understand the specifications contained in the eMMP or Works Order.

3.2.2 Materials handling, use and storage

The contractor shall ensure that any materials delivery drivers are informed of all procedures and restrictions (e.g. which access roads to use, no go areas, speed limits, noise, etc.) required by the eMMP before they arrive at site and off load any materials.

3.2.3 Method statements

Other method statements which are required during construction must be submitted to the Project Manager for approval 14 days *prior to the commencement of the activity*. This may include emergency construction method statements.

3.3 After construction complete

3.3.1 Site clean-up

The contractor shall clear and clean the site and ensure that everything not forming part of the permanent works is removed from site.

3.3.2 Re-vegetation and rehabilitation

The contractor shall be responsible for rehabilitating and re-vegetating all areas to the

satisfaction of the Client's Agent as detailed in the environmental rehabilitation specifications and related project specifications.

4. Environmental control officer

On this project AES will act as the ECO and will be responsible for making sure the eMMP is implemented. Failure to adhere to the eMMP may result in fines being issued to the contractor, construction being stopped by the environmental authorities and/ or payment being withheld. In its role as ECO, Zutari will advise the Client's Agent on environmental matters, attend the monthly site meetings and undertake *ad hoc* site visits. The eMMP is also an item on the agenda of the monthly site meeting.

4.1 Checklists

The contractor shall ensure that any issues identified in the daily and monthly checklists are rectified timeously. Before a closure of the project the contractor shall be responsible for completing the site closure checklist and forwarding it to the ECO.

4.2 Audits

The ECO and will be responsible for auditing compliance with the eMMP on an *ad hoc* basis (usually monthly). The audit report will be sent to the Client's Agent and the contractor. The contractor shall be responsible for rectifying any issues arising during the audit. A copy of the monthly audit criteria is attached as Appendix G.

4.3 Contact details

Please contact the ECO if you have any questions or comments regarding the eMMP.

(Note to Compiler: Insert additional contacts, depending on project)

ECO

Mr/Ms X

Tel: +27 41 503 3900

Fax: +27 86 600 4037

Cell: +27 72 355 9078

E-Mail: EnviroEC@ Zutari.com

Assistance with Rehabilitation

Ms xxxxx

Tel: +27 41 000 000

Fax: +27 86 xxxxx

Cell: +27 xxxxx

E-Mail: EnviroEC@ Zutari.com

Environmental Non-Compliance

Mr xxxx

Tel: +27 41 000 000

Fax: +27 86 xxxx

Cell: +27 xxxxx

APPENDIX A

WORK ORDERS

(Note to Compiler: Insert necessary works orders or compile additional new works orders, depending on project)

2025

Standard Operational Procedure Book

STANDARD OPERATIONAL PROCEDURE:		PREPARATION OF THE SITE		
	DOC. NO. MMP/MS 01	REV 01	DATE 29/09/2025	
			WRITTEN	
			T DUVENHAGE	
			REVIEWED	
			C JONKER	
			APPROVED	
			PROJECT MANAGER	

1. SCOPE

This instruction describes the requirements for the demarcation and preparation of the working area.

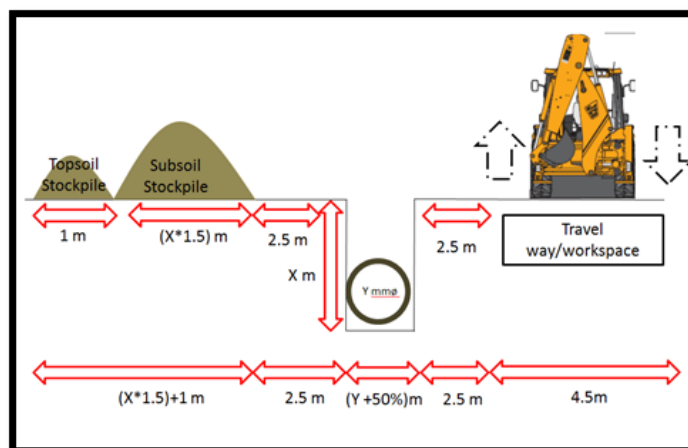
2. RESPONSIBILITY

The project manager is responsible for approving and for ensuring that this SOP is implemented.

The site supervisor is responsible for liaison with land owners, planning of the preparation site and for the implementation of this instruction.

3. METHOD

- Inform the EO of planned commencement.
- Demarcate the extent of the site and associated Works Areas in conjunction with EO. EO will involve the Search and Rescue Specialist if so required.
- For all pipelines, **up to depth of 3.5m**, a working width of 15m (as per diagram) is permitted for machine excavation, and 6m for manual excavation. For all pipelines **deeper than 3.5m**, working width need to be specified by the EO.



- All work on northern banks of Sundays, Kariega, Uie, Wit, Bezuidenhouts and Coerney River require approval from EO, as part of approval EO will specify working width.
- This working width must accommodate all construction related activities, including stockpiles, materials storage, travel ways, access routes etc.
- Work within existing servitude, any work outside the extent of the site footprint to be minimised as much as is possible.
- Maintain the demarcation line and ensure that no personnel or contraction materials move outside the designated work area.
- Do not establish any sites or do works besides those specified and allowed for, unless specifically agreed upon with the EO / ECO.
- Do not paint or mark any natural feature. Marking for surveying and other purposes must be done using pegs, beacons or rope and droppers.

STANDARD OPERATIONAL PROCEDURE:		PREPARATION OF THE SITE	
 Lower Sundays River Water User Association Laer Sondagsrivier Watergebruikersvereniging	DOC. NO. MMP/MS 01	REV 01	DATE 29/09/2025
	WRITTEN T DUVENHAGE		
	REVIEWED C JONKER		
	APPROVED PROJECT MANAGER		

- All access to work in Sundays, Kariëga, Uie, Wit, Bezuidenhouts and Coerney River area to be done in accordance with **MMP/MS0x**
- Clearing and grubbing will be carried out with an excavator. Stumps and large woody debris removed from the work area will be placed downslope in such a manner that they act as a trap to prevent excavated soil from being washed down the slope.
- On slopes the necessary erosion protection (**refer to MMP/MS0y**), need to be installed as soon as grubbing has commenced.

4. DRAWINGS

None

5. DECLARATION

5.1 PERSON UNDERTAKING THE WORKS

I understand the contents of this Standard Operational Procedure and the scope of the works required of me. I further understand that the ECO and Site Agent will audit my compliance with the contents of this Standard Operational Procedure. I understand waiving the opportunity to amend this document punitive measures may be imposed if found in non-compliance with this Standard Operational Procedure.

(signed)

(print name)

Dated: _____

5.2 ENVIRONMENTAL CONSULTANCY

The work described in this Standard Operational Procedure, if carried out according to the methodology described, is satisfactorily mitigated to prevent avoidable environmental harm:

(signed)

(print name)

Dated: _____

5.3 Client's Agent

The works described in this Standard Operational Procedure are approved.

(signed)

(print name)

(designation)

STANDARD OPERATIONAL PROCEDURE:		PREPARATION OF THE SITE	
 Lower Sundays River Water User Association Laer Sondagsrivier Watergebruikersvereniging	DOC. NO. MMP/MS 01	REV 01	DATE 29/09/2025
	WRITTEN T DUVENHAGE		
	REVIEWED C JONKER		
	APPROVED PROJECT MANAGER		

Dated: _____

STANDARD OPERATIONAL PROCEDURE:		ACCESSING THE SITE	
	DOC. NO. MMP/MS 02		DATE 13/10/2025
	WRITTEN		T DUVENHAGE
	REVIEWED		C JONKER
	APPROVED		PROJECT MANAGER

1. SCOPE

This instruction describes the requirements for the access to the working areas. These rivers surround various components of the canal infrastructure. Several syphons cross the Uie, Wit, Coerney, Kariega, and Sundays rivers, forming an integral part of the water transfer system. Additionally, the canal infrastructure has discharge points near the rivers when there is excess flow, such as at the Coerney, Uie, and Sundays rivers.

2. RESPONSIBILITY

The project manager is responsible for approving and for ensuring that this WO is implemented.

The site supervisor is responsible for planning of the access, negotiating with landowners and for the implementation of this instruction.

3. METHOD

- Existing access road adjacent to the canal infrastructure should be used, detail for access in other areas are provided below.
- Supervisor will identify the most appropriate route to use to the site where repair is needed.
- Supervisor will communicate the identified route to vehicle drivers or demarcate as specified in MMP/MS01.
- Access routes should not be grubbed unless approved by EO.
- All vehicles should make use of one access point and all vehicles need to travel on same route.

3.1 Wit River

Work on Enon syphon

- Access from R336
- All laydown and plant to be in servitude east of Wit river
- Work on syphon and valves by means of diversion in the river (demarcated on Drawing attached).

3.2 Uie

Kirkwood tunnel and reject.

- Access via golf course and all work to be managed in conjunction with Golf course staff (demarcated on Drawing attached).

3.3 Sundays River

- Korhaans weir partial reject
- JC Steyn reject

West Bank

- Westbank main Syphon & Scour valve
- Kariega Syphon & Scour
- Westbank Main Scour

STANDARD OPERATIONAL PROCEDURE:	ACCESSING THE SITE		
 Lower Sundays River Water User Association Laer Sondagsrivier Watergebruikersvereniging	DOC. NO. MMP/MS 02	REV 00	DATE 13/10/2025
	WRITTEN	T DUVENHAGE	
	REVIEWED	C JONKER	
	APPROVED	PROJECT MANAGER	

- Rooi Walle Reject

Kirkwood-Addo Main Canal

- Heatley Krans K20 reject (Uie)
- Tunnel no1
- Tunnel no 2
- Stilling scour into Wit Rivier
- Enon Syphon & Scour
- Tygeron main
- Selbourn Main “aftap”
- Scheepers main syphon& Scour

Addo Main

- Coernie syphon & reject
- Coernie 1234 tailend

Addo laer

- Duikergat (missing)
- Ceasars Dam
- MD 200 Syphon& Scour
- MacBean Syphon & scour

Comley Main Canal

- Barkley Reject 1
- Barkley Reject 2
- Miskraal Syphon
- Scour (River diversion) Sundays
- Summerville Canal
- Hartman’s krans (Directional drilling)
- Bezuidenhouts river Syphon & Scour
- Summerville reject (Sundays river)Partial Reject

- Access and working procedure to be determined by Operations Manager depended on season as water levels.
- drawing attached).

3.4 Kariega river

Kariega Syphon

- Access and working procedure to be determined by Operations Manager depended on season as water levels.

The sides of the valley start to steepen in this area and disturbance of mature trees and bush must be avoided. Any route need to be approved by EO.

4. DRAWINGS

Drawing xyz

[Note to Compiler: Take note that additional drawings need to be issues should attached diagrams not be sufficient]

STANDARD OPERATIONAL PROCEDURE:		ACCESSING THE SITE	
 Lower Sundays River Water User Association Laer Sondagsrivier Watergebruikersvereniging	DOC. NO. MMP/MS 02	REV 00	DATE 13/10/2025
	WRITTEN		T DUVENHAGE
	REVIEWED		C JONKER
	APPROVED PROJECT MANAGER		

5. DECLARATION

5.1 PERSON UNDERTAKING THE WORKS

I understand the contents of this Standard Operational Procedure and the scope of the works required of me. I further understand that the EO and Site Agent will audit my compliance with the contents of this Standard Operational Procedure. I understand waiving the opportunity to amend this document punitive measures may be imposed if found in non-compliance with this Standard Operational Procedure.

(signed) (print name)

Dated: _____

5.2 ENVIRONMENTAL CONSULTANCY

The work described in this Standard Operational Procedure, if carried out according to the methodology described, is satisfactorily mitigated to prevent avoidable environmental harm:

(signed) (print name)

Dated: _____

5.3 Client's Agent

The works described in this Standard Operational Procedure are approved.

(signed) (print name) (designation)

Dated: _____

METHOD STATEMENT:		PROTECTION NATURAL FEATURES		
 Lower Sundays River Water User Association Laer Sondagsrivier Watergebruikersvereniging	DOC. NO. MMP/MS 03	REV 00	DATE 10/10/2025	
	WRITTEN		T DUVENHAGE	
	REVIEWED		C JONKER	
	APPROVED		PROJECT MANAGER	

1. SCOPE

This instruction describes the requirements for the protection of vegetation and natural features.

2. RESPONSIBILITY

The project manager is responsible for approving and for ensuring that this MS is implemented.

The site supervisor is responsible for monitoring and for the implementation of this instruction.

3. METHOD

- Inform EO of intended commencement so that species of special concern are demarcated on site.
- Fence in all plant specimens and communities to be protected, at the distance of the outermost dripline.
- Protection fences are to comply with fencing used in as per H&S requirements, unless specifically instructed by EO. These are to remain in position until the cessation of Works.
- Do not disturb, deface, destroy or remove protected plants and features, whether fenced or not, for the duration of the Contractor's presence on site, unless otherwise specified by the EO.
- The Site Supervisor will be held liable for the replacement of any plant or feature that is removed or damaged by the Team or Sub-Contractor's negligence or mismanagement.
- Do not remove any large tree without the permission of the EO. Tree earmarked for removal need to be marked and approved by the EO, prior to felling for approval.
- No open fires are permitted under trees.
- No material storage or laydown is permitted under trees.
- No heavy equipment, machinery and vehicles may be parked under any tree.
- No vegetative matter may be removed for firewood.

Following areas have been identified as sensitive areas and need to be protected during construction.

- Korhaans weir partial reject - **disturbance of mature trees and bush must be avoided.**
- JC Steyn reject- **disturbance of mature trees and bush must be avoided.**

West Bank

- Westbank main Syphon & Scour valve - **The sides of the river start to steepen in this area and disturbance of mature trees and bush must be avoided.**
- Kariega Syphon & Scour - **must be treated as sensitive**
- Westbank Main Scour - **must be treated as sensitive**

METHOD STATEMENT:	PROTECTION NATURAL FEATURES		
 Lower Sundays River Water User Association Laer Sondagsrivier Watergebruikersvereniging	DOC. NO. MMP/MS 03	REV 00	DATE 10/10/2025
	WRITTEN	T DUVENHAGE	
	REVIEWED	C JONKER	
	APPROVED	PROJECT MANAGER	

- Rooi Walle Reject - steep slopes and disturbance of mature trees and bush must be avoided.

Kirkwood-Addo Main Canal

- Heatley Krans K20 reject (Uie) - steep slopes and disturbance of mature trees and bush must be avoided.
- Tunnel no1 - must be treated as sensitive
- Tunnel no 2 - must be treated as sensitive
- Stilling scour into Wit Rivier - must be treated as sensitive
- Enon Syphon & Scour - must be treated as sensitive

Tygeron main

- Selbourn Main "aftap" - must be treated as sensitive
- Scheepers main syphon & Scour - must be treated as sensitive

Addo Main

- Coernie syphon & reject - must be treated as sensitive
- Coernie 1234 tailend - must be treated as sensitive

Addo laer

- Duikergat (missing) - must be treated as sensitive
- Ceasars Dam - must be treated as sensitive
- MD 200 Syphon & Scour - must be treated as sensitive
- MacBean Syphon & scour - must be treated as sensitive

Comley Main Canal

- Barkley Reject 1 - steep slopes and disturbance of mature trees and bush must be avoided.
- Barkley Reject 2 - steep slopes and disturbance of mature trees and bush must be avoided.
- Miskraal Syphon - must be treated as sensitive
- Scour (River diversion) Sundays- must be treated as sensitive
- Summerville Canal- must be treated as sensitive
- Hartman's krans (Directional drilling) - must be treated as sensitive
- Bezuidenhouts river Syphon & Scour - disturbance of mature trees and bush must be avoided.
- Summerville reject (Sundays river) Partial Reject- disturbance of mature trees and bush must be avoided.

4. FAUNA

- No animal may be handled, removed or be interfered with.
- No animal may be hunted, snared, captured, injured or killed. This includes animals perceived to be vermin.
- Ensure that no poaching of fauna, on site or on adjacent properties takes place. The penalty clause associated with the needless destruction of wildlife is a fine of R5 000 and a report to an Animal Welfare Organisation, which may lead to further fine and imprisonment.

METHOD STATEMENT:	PROTECTION NATURAL FEATURES		
 Lower Sundays River Water User Association Laer Sondagsrivier Watergebruikersvereniging	DOC. NO. MMP/MS 03	REV 00	DATE 10/10/2025
	WRITTEN	T DUVENHAGE	
	REVIEWED	C JONKER	
	APPROVED	PROJECT MANAGER	

- No animal may be fed on site.
- Ensure that the Work Site is kept clean, tidy and free of rubbish that would attract animal pests.
- Report problem animals and vermin to the EO.
- Remove problem animals and vermin only upon instruction by the EO. In case of dead animals, the necessary arrangement needs to be made with a registered animal origination or authorized person, as determined by NMBM bylaws, to dispose of the carcass.
- Ensure that Works are safe and that domesticated animals belonging to the local communities are kept away.

5. DRAWINGS

In Addition to Page 3&4 additional Drawings xyz were added

[Note to Compiler: Take note that additional drawings need to be issues should attached diagrams not be sufficient]

METHOD STATEMENT:		PROTECTION NATURAL FEATURES	
 Lower Sundays River Water User Association Laer Sondagsrivier Watergebruikersvereniging	DOC. NO. MMP/MS 03	REV 00	DATE 10/10/2025
	WRITTEN		T DUVENHAGE
	REVIEWED		C JONKER
	APPROVED		PROJECT MANAGER

Intentionally Left Blank to add Drawings

METHOD STATEMENT:		PROTECTION NATURAL FEATURES	
 Lower Sundays River Water User Association Laer Sondagsrivier Watergebruikersvereniging	DOC. NO. MMP/MS 03	REV 00	DATE 10/10/2025
	WRITTEN		T DUVENHAGE
	REVIEWED		C JONKER
	APPROVED		PROJECT MANAGER

6. DECLARATION

6.1 PERSON UNDERTAKING THE WORKS

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that the EO and Site Agent will audit my compliance with the contents of this Method Statement. I understand waiving the opportunity to amend this document punitive measures may be imposed if found in non-compliance with this Method Statement.

(signed) (print name)

Dated: _____

6.2 ENVIRONMENTAL CONSULTANCY

The work described in this Method Statement, if carried out according to the methodology described, is satisfactorily mitigated to prevent avoidable environmental harm:

(signed) (print name)

Dated: _____

6.3 CLIENT'S AGENT

The works described in this Method Statement are approved.

(signed) (print name) (designation)

Dated: _____

METHOD STATEMENT:		SITE CLOSURE & REHABILITATION		
 Lower Sundays River Water User Association Laer Sondagsrivier Watergebruikersvereniging	DOC. NO. MMP/MS 04	REV 00	DATE 07/10/2025	
	WRITTEN	T DUVENHAGE		
	REVIEWED	C JONKER		
	APPROVED PROJECT MANAGER			

1. SCOPE

This instruction describes the requirements for the closure and rehabilitation of the site.

2. RESPONSIBILITY

The project manager is responsible for approving and for ensuring that this MS is implemented.

The site supervisor is responsible for monitoring and for the implementation of this instruction.

3. METHOD

- Clear and remove all constructional plant, equipment, surplus rock and other materials, rubbish and temporary works of every kind. Areas thus cleared shall be graded and scarified to restore the ground to its original profile as near as practicable before topsoil placement and re-vegetation commences.
- Areas requiring shaping involving bulk earthworks shall be excavated, filled, compacted when required and shaped to correct contours to within a tolerance of approximately 150mm. Shaping will be to roughly rounded off cuts and fills and any other earthworks to stable forms, sympathetic to the natural surrounding landscape. Such works shall be considered as earthworks and measurement and payment shall be made under the relevant clause in SABS 1200 D or 1200 DA, as applicable or as specified.
- Trimming shall consist of bringing the existing or previously shaped ground to an even surface with the final levels generally following the original surface. Where machine operations are not practicable, determined by the EO, trimming shall be carried out using hand tools, but trimming of rock outcrops will not be required. Areas previously shaped shall be trimmed to within a tolerance of approximately 100mm, with all undulations following a smooth curve.
- Trimmed surfaces shall be left slightly rough to facilitate binding with the topsoil for the natural establishment of vegetation. During trimming, all stones with any dimension in excess of 30mm in areas to be mown by machines, all stones with dimension in excess of 150mm in other areas and all other excess material, shall be removed to selected and approved sites. Trimming of any areas requiring grassing shall be carried out in such a way that, following application to any topsoil and cultivation, the finished surface of the area is approximately 25mm below the top of adjacent curbing, channelling or pavement.
- Prior to the application of topsoil, the ground surface shall be tilled by hand, tilling to a depth of approximately 100 mm, until the condition of the soil is acceptable, as approved by the EO.
- Where tilling is difficult, the Contractor shall use rotary tillage machinery until no clods or lumps larger than 40 mm in size remain, and the mixing of soil is acceptable to the EO.
- All areas onto which topsoil is to be spread shall be graded to the approximate original landform with max. Slopes of 1:2.5 and shall be ripped to 300mm depth or at least 100mm into the subbase soil prior to topsoil placement. The entire area to be top soiled shall be ripped parallel to the contours, 300mm apart and to a minimum depth of 300mm, where

METHOD STATEMENT:	SITE CLOSURE & REHABILITATION		
 Lower Sundays River Water User Association Laer Sondagsrivier Watergebruikersvereniging	DOC. NO. MMP/MS 04	REV 00	DATE 07/10/2025
	WRITTEN	T DUVENHAGE	
	REVIEWED	C JONKER	
	APPROVED PROJECT MANAGER		

possible. The top soiling activity shall be executed prior to the rainy season and or to any expected wet weather conditions.

- Stockpiled topsoil shall be placed onto the same zone from where it had been stripped. However, if there is insufficient topsoil available from a particular soil zone to produce the minimum specified depth, topsoil of similar quality may be brought from other zones of similar quality, where the topsoil requirement is less, on the approval of the EO.
- Topsoil shall be mounded and shaped around manholes and valve chambers which protrude above ground and over pipelines to facilitate subsequent consolidation of the backfill. The Contractor shall ensure that storm water run-off is not channelled alongside the gentle mounding, but that it is taken diagonally across it.
- The suitability of the substitute material shall be determined by means of a soil analysis addressing soil fraction, fertility, pH and drainage, which is approved by the EO.
- No vehicles shall be allowed access onto or through topsoil areas after it has been placed.
- After topsoil placement is complete, cleared and stockpiled vegetation matter shall be spread randomly by hand over the topsoiled area as indicated by the EO.
- The final prepared surface shall not be smooth but furrowed to follow the natural contours of the land, with scattered rocks of varying sizes according to the natural condition of the area. Levels incompatible to the surrounding landscape shall be reshaped.
- All cut and fill slopes shall be left as rough as possible and shall contain ledges to facilitate the accumulation of topsoil. The ledges shall be dug at random to appear natural.

3.1 River Vegetation

- For maintenance purposes the sediment must be stockpiled above the riparian vegetation zone in heaps not higher than 2 m at an approved site.
- Topsoil (300 mm) must be stripped, stored and redistributed over the stockpile areas.
- Only one approved access route must be used.
- No trees must be damaged.
- Other riparian vegetation damaged during the activities to be reinstated as prescribed elsewhere.

3.2 Wetlands

- In artificial wetland areas, topsoil shall be removed to a depth of approximately 200 mm, the wetlands excavated, and topsoil replaced. Wetland areas are then to be selectively composted, as determined by the EO.
- Prior to any site clearance, the wetland areas, along with 10 m buffer zones, as indicated on the Revegetation Plan are to be effectively fenced off to prevent any damage to wetland material on sites prior to transplanting.

3.3 Seeding

- The area to be seeded must be ripped and be wet to a depth specified by the RE / ECO, before any seeding commences. The seed mixture and fertiliser mixture, if any, halved and applied evenly in two immediate successive applications perpendicular to each other when spread by hand. The seeded area shall then immediately thereafter be brushed over

METHOD STATEMENT:		SITE CLOSURE & REHABILITATION		
 Lower Sundays River Water User Association Laer Sondagsrivier Watergebruikersvereniging	DOC. NO. MMP/MS 04	REV 00	DATE 07/10/2025	
	WRITTEN	T DUVENHAGE		
	REVIEWED	C JONKER		
	APPROVED PROJECT MANAGER			

by in an approved manner, to the satisfaction of EO. The seeded area shall then be well watered, if possible. All types of seeding shall preferably be done during the rainy season.

- The Contractor shall use all the appropriate tools and equipment for the ripping and sowing works

3.4 Transplanting of natural vegetation:

- Natural vegetation such as Aloes, trees, shrubs, ferns, tubers, grass, perennials and aquatic species on the Site, which shall be identified by the EO shall be transplanted.
- Transplanting activities shall preferably take place in winter and with deciduous trees, before the new growth appears.
- Transplanted plants shall be pruned back to limit transpiration. Plants shall also be sprayed with an evapotranspiration retardant liquid if they are evergreen.
- Aloes and bulbous plants shall be transplanted into similar soil conditions and to the same depth as they were before removal and shall be watered once directly after transplanting.
- Trees to be transplanted must be carefully removed from the soil so as to leave its original in-situ position with as large a rootball as practically possible, using their respective driplines as an indicator. Care shall be taken to minimise disturbance of soil to remaining roots in rootball, during the lifting, moving and or transportation of all transplantable species. For trees from 1 to 1,5 m in height, trenching around the tree shall occur at least 0,5 m away from the stem.
- The rootball shall be wrapped in Hessian or in plastic sheeting to retain the soil.
- The original tree's orientation to north, prior to trenching, shall remain the same when planted in its new position.

3.5 General

- The Contractor shall undertake all soiling, seeding and grass establishment as specified at times specified, taking into account the climatic conditions prevalent in order to maximise the growth of vegetation and therefore reduce erosion.
- Monitor the construction site at least every month during construction and up to and until 1 year after the commencement of the maintenance period, 3 times yearly.

4. DRAWINGS

Drawing xyz

[Note to Compiler: Take note that additional drawings need to be issues should attached diagrams not be sufficient]

5. DECLARATION

5.1 PERSON UNDERTAKING THE WORKS

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that the EO and Site Agent will audit my compliance with the contents of this Method Statement. I understand waiving the opportunity to amend this

METHOD STATEMENT:		SITE CLOSURE & REHABILITATION	
 Lower Sundays River Water User Association Laer Sondagsrivier Watergebruikersvereniging	DOC. NO. MMP/MS 04	REV 00	DATE 07/10/2025
	WRITTEN		T DUVENHAGE
	REVIEWED		C JONKER
	APPROVED		PROJECT MANAGER

document punitive measures may be imposed if found in non-compliance with this Method Statement.

(signed) (print name)

Dated: _____

5.2 ENVIRONMENTAL CONSULTANCY

The work described in this Method Statement, if carried out according to the methodology described, is satisfactorily mitigated to prevent avoidable environmental harm:

(signed) (print name)

Dated: _____

5.3 Client's Agent

The works described in this Method Statement are approved.

(signed) (print name) (designation)

Dated: _____

WORK ORDER:	WATER COURSE CROSSINGS (DIVERSION)		
 Lower Sundays River Water User Association Laer Sondagsrivier Watergebruikersvereniging	DOC. NO. MMP/MS 05(A)	REV 00	DATE 06/10/2025
	WRITTEN T DUVENHAGE		
	REVIEWED C JONKER		
	APPROVED PROJECT MANAGER		

1. SCOPE

This instruction describes the requirements for river crossings using a diversion.

2. RESPONSIBILITY

The project manager is responsible for approving and for ensuring that this WO is implemented.

The site supervisor is responsible for monitoring and for the implementation of this instruction.

3. METHOD

- When planning work in or near watercourses the Contractor shall take into account possible river levels during the period of construction
- The Contractor shall program the execution of the Works such that Construction within flowing water is minimized. All diversions shall be in place, water diverted away from the Working Area and the area sandbagged prior to excavations commencing
- Construction equipment shall not ford any watercourse or operate from within the river channel unless it is essential to the execution of the Works. All works within flowing water shall be subject to prior authorisation
- Watercourse sizes are defined below.
 - Small: watercourses <6 m bankfull width
 - Medium: watercourses 6-15 m bankfull width
 - Large: watercourses >15 m bankfull width
- If there is a high velocity streamflow, install deflection barrier (e.g., median barriers) to permit construction of dam outside full streamflow.
- Construct a coffer dam from local materials, sandbags, 1 m³ sandbags, water-filled dams, sheet piling, median barriers, gravel or other appropriate material to extend over halfway across the watercourse.
- Install impermeable barrier within coffer dam wall.
- Install riprap on upstream side to protect the dam from erosion, if dam is constructed of loose material.
- Spoil storage shall be above the high-water mark or protected by erosion control measures to ensure that, when the water level rises after all flow has been channelized into one channel, spoil is not washed away.
- Install sumps to collect seepage and then pump to dewatering area.
- Ensure discharge area can handle the volume of water and silt pumped to shore.
- Complete trenching, lowering in and backfilling.
- Remove dam, reconstruct bank.
- Repeat process for other channel.
- Temporary diversion also may be made through abandoned channels as long as steps are taken to minimize a flush of sediment once the watercourse is redirected through the "new" channel.

WORK ORDER:  Lower Sundays River Water User Association Laer Sondagsrivier Watergebruikersvereniging	WATER COURSE CROSSINGS (DIVERSION)		
	DOC. NO. MMP/MS 05(A)	REV 00	DATE 06/10/2025
	WRITTEN T DUVENHAGE		
	REVIEWED C JONKER		
	APPROVED PROJECT MANAGER		

- Temporary diversion through a channel excavated into a flood plain is possible if lined or passed through a flexible conduit to prevent excessive erosion along the "new" channel.
- When working in flowing water, the Contractor shall ensure that downstream sedimentation is controlled by installing the necessary temporary sedimentation barriers.
- The temporary sedimentation barrier shall consist of a geotextile fabric stretched across and attached to supporting posts and entrenched. The sedimentation barrier shall be of sufficient length such that the bottoms of the end sections of fence are higher in elevation than the top of the centre section to eliminate end flow. The plan configuration shall resemble an arc with ends orientated upslope. The height of the sedimentation barrier shall be a minimum of 500 mm and shall not exceed 1 m. Woven geotextile fabric shall be purchased in a continuous roll and cut to the length of the barrier to avoid use of joints. Posts shall be either 10 cm diameter wood or 2 kg/m steel with a minimum length of 1.5 m. The posts shall be spaced a maximum of 90 cm apart and driven securely into the ground a minimum of 500 mm. A trench shall be excavated approximately 100 mm wide and 100 mm deep along the line of the stakes and upstream of the barrier. The geotextile fabric shall be stapled or wired to the posts and 200 mm of the fabric shall be extended into the trench. The trench shall be backfilled and the soil compacted over the geotextile. The sedimentation barrier shall be inspected daily and any damage shall be immediately repaired. Sediment deposits shall be removed once they reach approximately half the height of the barrier and disposed of via the solid waste management system.
- Temporary diversions..... shall be lined with 250 um plastic or geotextile fabric to control the erosive effects of the river flow and prevent the migration of fines into the river. The full cross-section of the temporary diversion shall be lined, and the plastic/ geotextile strips shall extend for a minimum of 2 m beyond the lip of the excavation and shall be anchored using sandbags. Adjacent plastic/ geotextile strips shall be overlapped with the upstream plastic sheeting section overlaying the downstream section
- During the execution of the Works, the Contractor shall take appropriate measures to prevent pollution and contamination of the riverine environment e.g. including ensuring that construction equipment is well maintained, using drip trays, provision of bins, monitoring etc
- Where earthwork is being undertaken in close proximity to any watercourse, slopes shall be stabilised using sandbags or geotextile to prevent sand and rock from entering the channel.
- Appropriate rehabilitation and revegetation measures for the riverbanks, as outlined in the MMP/MS04 - Closure, shall be implemented timeously. In this regard, the banks should be appropriately and incrementally stabilized as soon as construction allows.

4. DRAWINGS

Drawing xyz

[Note to Compiler: Take note that additional drawings need to be issues should attached diagrams not be sufficient]

WORK ORDER:  Lower Sundays River Water User Association Laer Sondagsrivier Watergebruikersvereniging	WATER COURSE CROSSINGS (DIVERSION)		
	DOC. NO. MMP/MS 05(A)	REV 00	DATE 06/10/2025
	WRITTEN		T DUVENHAGE
	REVIEWED		C JONKER
	APPROVED PROJECT MANAGER		

5. DECLARATION

5.1 PERSON UNDERTAKING THE WORKS

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that the EO and Site Agent will audit my compliance with the contents of this Method Statement. I understand waiving the opportunity to amend this document punitive measures may be imposed if found in non-compliance with this Method Statement.

(signed) (print name)

Dated: _____

5.2 ENVIRONMENTAL CONSULTANCY

The work described in this Method Statement, if carried out according to the methodology described, is satisfactorily mitigated to prevent avoidable environmental harm:

(signed) (print name)

Dated: _____

5.3 Client's Agent

The works described in this Method Statement are approved.

(signed) (print name) (designation)

Dated: _____

WORK ORDER:	RIVER CROSSING (MINOR)		
 Lower Sundays River Water User Association Laer Sondagsrivier Watergebruikersvereniging	DOC. NO. MMP/MS 05	REV 01	DATE 08/10/2025
	WRITTEN T DUVENHAGE		
	REVIEWED C JONKER		
	APPROVED PROJECT MANAGER		

1. SCOPE

This instruction describes the requirements for the demarcation and preparation of the working area.

2. RESPONSIBILITY

The project manager is responsible for approving and for ensuring that this MS is implemented.

The site supervisor is responsible for liaison with landowners, planning of the preparation site and for the implementation of this instruction.

3. METHOD

- Reduce time spent within stream work.
- The installation of any watercourse crossing should be carried out as quickly as possible to prevent prolonged channel disruption or exposure of vulnerable areas to erosion. The extent of channel disruption and other environmental problems such as siltation often relates directly to the amount of time spent on instream works.
- Identify any sites that have been designated for nature conservation the conservation requirements are met.
- Identify any protected species and ensure they are not harmed or disturbed.
- If construction requires working in the bed of the river, then the works area should be isolated and kept dry.
- If required, store the natural riverbed material during the construction phase and keep it clean. When construction is complete use the stored bed material to restore the riverbed.
- Restore any affected banks by re-establishing native riparian vegetation.
- All access to work in Uie, Wit, Coerney, Kariega, and Sundays river areas to be done in accordance with MMP/MS02.

4. DRAWINGS

None

5. DECLARATION

5.1 PERSON UNDERTAKING THE WORKS

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that the ECO and Site Agent will audit my compliance with the contents of this Method Statement. I understand waiving the opportunity to amend this document punitive measures may be imposed if found in non-compliance with this Method Statement.

(signed)

(print name)

WORK ORDER:		<i>RIVER CROSSING (MINOR)</i>	
 Lower Sundays River Water User Association Laer Sondagsrivier Watergebruikersvereniging	DOC. NO. MMP/MS 05	REV 01	DATE 08/10/2025
	WRITTEN T DUVENHAGE		
	REVIEWED C JONKER		
	APPROVED PROJECT MANAGER		

Dated: _____

5.2 ENVIRONMENTAL CONSULTANCY

The work described in this Method Statement, if carried out according to the methodology described, is satisfactorily mitigated to prevent avoidable environmental harm:

(signed) (print name)

Dated: _____

5.3 Client's Agent

The works described in this Method Statement are approved.

(signed) (print name) (designation)

Dated: _____

WORK ORDER:	EROSION PROTECTION		
 Lower Sundays River Water User Association Laer Sondagsrivier Watergebruikersvereniging	DOC. NO. MMP/MS 06	REV 01	DATE 28/02/25
	WRITTEN T DUVENHAGE		
	REVIEWED C JONKER		
	APPROVED PROJECT MANAGER		

1. SCOPE

This instruction describes the requirements for the demarcation and preparation of the working area.

2. RESPONSIBILITY

The project manager is responsible for approving and for ensuring that this MS is implemented.

The site supervisor is responsible for liaison with land owners, planning of the preparation site and for the implementation of this instruction.

3. METHOD

- Inform the EO of intent to establish site at least prior to commencement.
- The EO will confirm whether a plant Search and Rescue is required prior to site establishment
- Demarcate the extent of the site and associated Works Areas in conjunction with EO. Any work of a duration of less than 1 week may be marked with an ISO approved eco-friendly water-soluble marking paints (Go-Mark field marking paint or similar) or another agreed biodegradable marking material. In case of work exceeding a duration of 1 week, the area is to be demarcated with poles, minimum length 1.5m and painted. The poles are to be placed at intervals not exceeding 15 meters. The use of danger tape to demarcate the site extent is prohibited.
- Vegetation clearance near the Sundays river should be done in consultation with the ECO and relevant specialists

3.1 Silt Fences

- need to be installed as soon as grubbing has commenced.

3.2 Gabions

4. DRAWINGS

Drawing xyz

[Note to Compiler: Take note that additional drawings need to be issues should attached diagrams not be sufficient]

5. DECLARATION

5.1 PERSON UNDERTAKING THE WORKS

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that the EO and Site Agent will audit my compliance with the contents of this Method Statement. I understand waiving the opportunity to amend this document punitive measures may be imposed if found in non-compliance with this Method Statement.

(signed)

(print name)

WORK ORDER:	EROSION PROTECTION		
 Lower Sundays River Water User Association Laer Sondagsrivier Watergebruikersvereniging	DOC. NO. MMP/MS 06	REV 01	DATE 28/02/25
	WRITTEN T DUVENHAGE		
	REVIEWED C JONKER		
	APPROVED PROJECT MANAGER		

Dated: _____

5.2 ENVIRONMENTAL CONSULTANCY

The work described in this Method Statement, if carried out according to the methodology described, is satisfactorily mitigated to prevent avoidable environmental harm:

(signed) (print name)

Dated: _____

5.3 Client's Agent

The works described in this Method Statement are approved.

(signed) (print name) (designation)

Dated: _____

APPENDIX B

DRAWINGS

(Note to Compiler: Insert necessary standard drawings as per LSRWUA approved list or compile additional new drawings, depending on project)

Environmental Maintenance Management Plan (eMMP) Guideline
Document For Operational Staff



 ACCESS ROADS AGAINST GRADIENTS-	✓	2025/11/18 15:06	PDF Document	39 KB
 EROSION PROTECTION ON STEEP EMBA...	✓	2025/11/18 15:06	PDF Document	22 KB
 KERB INLET PROTECTION DETAIL-	✓	2025/11/18 15:05	PDF Document	67 KB
 MANAGEMENT OF BACKFILL IN SHALLO...	✓	2025/11/18 15:05	PDF Document	44 KB
 ORGANIC FILTER TUBE DETAIL-	✓	2025/11/18 15:05	PDF Document	41 KB
 PIPELINE CROSSING WETLAND-PIPELINE...	✓	2025/11/18 15:05	PDF Document	87 KB
 SEDIMENT TRAP (TYPE A)-	✓	2025/11/18 15:04	PDF Document	61 KB
 SEDIMENT TRAP (TYPE B)-	✓	2025/11/18 15:04	PDF Document	34 KB
 SEDIMENT TRAP-SEDIMENT TRAP-	✓	2025/11/18 15:06	PDF Document	234 KB
 SILT FENCH (1 OF 2)-	✓	2025/11/18 15:04	PDF Document	49 KB
 SILT FENCH (2 OF 2)-	✓	2025/11/18 15:03	PDF Document	38 KB
 STRAW BALES (1 OF 3)-	✓	2025/11/18 15:03	PDF Document	61 KB
 STRAW BALES (2 OF 3)-	✓	2025/11/18 15:03	PDF Document	35 KB
 STRAW BALES (3 OF 3)-	✓	2025/11/18 15:03	PDF Document	54 KB
 STREAM CROSSING SECTION DETAIL-	✓	2025/11/18 15:02	PDF Document	47 KB
 TREE SPECIFICATIONS (1 OF 2)-	✓	2025/11/18 15:02	PDF Document	66 KB
 TREE SPECIFICATIONS (2 OF 2)-	✓	2025/11/18 15:02	PDF Document	59 KB

APPENDIX C

MAPS

(Note to Compiler: Insert necessary standard maps of sensitive areas or compile additional and issue as drawings, depending on project)

APPENDIX D

SPECIFICATIONS

(Note to Compiler: Insert Spec EMA or EMB if appointment is per GCC 2015 requirements, if it is internal project these may be omitted depending on project)



Lower Sundays River
Water User Association

Laer Sondagsrivier
Watergebruikersvereniging

LOWER SUNDAYS RIVER WATER USER ASSOCIATION

[Click here to enter a date.](#)

TENDER NO. [Insert project reference](#)

[Insert Project Name](#)

**PARTICULAR SPECIFICATION EMA
ENVIRONMENTAL MANAGEMENT
(Comprehensive)**

PARTICULAR SPECIFICATION EMA: ENVIRONMENTAL MANAGEMENT (COMPREHENSIVE)

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[Note to Compiler: USE OF THIS DOCUMENT]

This is a generic example specification document and it should be used as a guide to compile a PARTICULAR SPECIFICATION EMA: ENVIRONMENTAL MANAGEMENT (COMPREHENSIVE) for a specific project to be included in the contract documentation for the Contractor.

1. "Notes to Compiler" comments:

- All comments in this document in green and within [square brackets] are comments helping with converting this generic Specifications into a Particular Specification.*
- Comments, including this section, should all be deleted from the final EMA as it is a legal document that must stand alone and be final.*

2. Compiler qualifications:

- It is advisable that the Specifications be compiled by a Registered Landscape Architect **or** a team consisting of a Civil Engineer and an Environmental Specialist with a proven track record of 5 years dealing with infrastructure projects using this generic Specifications as a guide.*

3. Relevant clauses:

- Only clauses relevant to the specific project must form part of the final EMA.*
- Only the numbered option/s relevant to the specific project must be used in the EMA with the rest of the options being deleted. If part of an option is relevant/none of the options are relevant then new wording must be used.*
- These options are only guidelines and must be taken as such. The compiler must adapt the document to reflect site conditions and Environmental Authorisation conditions. It is not a cut and paste exercise for an inexperienced practitioner. This generic Specification must not be used to develop an EMA without a good understanding of the project and the environmental issues]*

PARTICULAR SPECIFICATION EMA: ENVIRONMENTAL MANAGEMENT (COMPREHENSIVE)

1. SCOPE

This Specification covers the requirements for controlling the impact of construction activities on the environment. It contains clauses that are generally applicable to the undertaking of civil engineering works in areas where it is necessary to impose pro-active controls on the extent to which the construction activities impact on the environment.

This Particular specification, which forms an integral part of the contract documents, informs the contractor as to his duties in the fulfilment of the project objectives, with particular reference to the prevention and mitigation of environmental impacts caused by construction activities associated with the project. The contractor should note that obligations imposed by the Particular specification are legally binding in terms of this contract. In the event that any rights and obligations contained in this Particular specification contradict those specified in the standard or project specifications then the latter shall prevail.

Interpretations and variations of this Specification are set out in the Specification Data.

2. NORMATIVE REFERENCES

2.1 Supporting specifications

Where this Specification is required for a project the following specifications shall, inter alia, form part of the Contract Document.

- a) SANS 1200 Series of Standardized Specifications;
 - i) SANS 1200 A or SANS 1200 AA, as applicable;
 - ii) SANS 1200 C;
 - iii) SANS 1200 D.
- b) Specification AO (Occupational Health and Safety),
- c) Construction Regulations, 2010, and
- d) Standards listed in Appendix A. ¹

3. DEFINITIONS

[Note to Compiler: Insert additional definitions, depending on complexity of the project and level of understanding required]

For the purposes of this Specification the definitions and abbreviations given in the applicable specifications listed in 2.1 and the following definitions shall apply:

Construction Activity:

Any action taken by the contractor, his sub-contractors, suppliers or personnel during the construction process as defined in the contract documents.

Contaminated water:

Water contaminated by the Contractor's activities, e.g. concrete water and runoff from plant/ personnel wash areas.

Environment:

The surroundings within which humans exist and that are made up of:

¹ See Appendix A

- a) The land, water and atmosphere of the earth;
- b) Micro-organisms, plant and animal life;
- c) Any part or combination of a) and b) and the interrelationships among and between them; and
- d) The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

Environmental Authorisation:

A written statement from the National Department of Environmental Affairs (DEA) or relevant provincial department with the general and specific conditions and the EMPr recording its approval of an application for a planned undertaking that triggers listed activities in the Environmental Impact Assessment (EIA) regulations of the National Environmental Management Act (NEMA No.107 of 1998).

Method Statement:

A written submission by the Contractor to the Engineer in response to the Specification or a request by the Engineer, setting out the plant, materials, labour and method the Contractor proposes using to carry out an activity, identified by the relevant specification or the Engineer when requesting the Method Statement, in such detail that the Engineer is enabled to assess whether the Contractor's proposal is in accordance with the Specifications and/or will produce results in accordance with the Specifications.

The Method Statement shall cover applicable details with regard to:

- Construction procedures;
- Materials and equipment to be used;
- Transportation of equipment/materials to and from site;
- Movement of equipment/material on site;
- Storage of materials on site;
- Containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- Timing and location of activities;
- Areas of non-compliance with the Specifications; and
- Any other information deemed necessary by the Engineer.

Potentially hazardous Substance:

A substance that, in the reasonable opinion of the Engineer, can have a deleterious effect on the environment as contemplated in the South African National Standard (SANS 10234).

Reasonable:

Unless the context indicates otherwise, reasonable in the opinion of the Engineer after he has consulted with a person, not an Employee of the Employer, suitably experienced in "environmental implementation plans" and "environmental management programmes" (as defined in NEMA 107 of 1998).

Solid waste:

All solid waste, including, chemical waste, wrapping

materials, food and domestic waste (e.g. plastic packets and wrappers). Depending on requirement may include limited construction debris, excess cement/ concrete, timber, tins and cans, drums, wire, nails.

Topmaterial :

Topsoil is considered to be the natural soil covering, including all the vegetation and organic matter. Depth may vary at each site but in general it is considered to be the top 150 mm of soil (topsoil) and root material of cleared vegetation. Topsoil should be identified via simple soil tests.

Water Course:

A water course is defined as:

- a) A river or spring;
- b) A natural channel or depression in which water flows regularly or intermittently;
- c) A wetland, lake or dam into which, or from which, water flows; and
- d) Any collection of water which the Minister may, by notice in a Gazette, declare to be a watercourse as defined in the National Water Act, 1998 (Act No. 36 of 1998).

A reference to a watercourse includes, where relevant, its bed and banks.

Wetland:

Land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.

4. LEGAL REQUIREMENTS

Construction shall be according to the best industry practices, as identified in the project documents.

4.1 Statutory and other applicable legislation

In addition to this particular specification it is necessary for the Contractor to be conversant with all legislation pertaining to the environment, including provincial and local government ordinances, which may be applicable to the contract.

[Note to Compiler: Insert additional or remove legislation as applicable]

Major environmental legislation, as amended from time to time, includes but is not limited to the following:

- a) The Constitution Act (No. 6 of 1996)
- b) National Environmental Management Act (NEMA) (No. 107 of 1998)
- c) National Environmental Management: Air Quality Act (No. 39 of 2004) and Atmospheric Pollution Prevention Act (No. 45 of 1965)
- d) National Environmental Management: Biodiversity Act (No. 10 of 2004)
- e) National Environmental Management: Protected Areas Act (No. 57 of 2003)
- f) National Environmental Management: Waste Act (No. 59 of 2008)
- g) National Forests Act (No. 84 of 1998)
- h) National Heritage Resources Act (No. 25 of 1999)

- i) National Water Act (No. 36 of 1998)
- j) Conservation of Agricultural Resources Act (No. 43 of 1983)
- k) Mineral and Petroleum Resources Development Act (No. 28 of 2002).
- l) Environment Conservation Act (No. 73 of 1989)
- m) National Environmental Management: Biodiversity Act (No. 10 of 2004)
- n) National Environmental Management: Waste Act (No. 59 of 2008)
- o) Mineral and Petroleum Resources Development Act (No. 28 of 2002)
- p) National Environmental Management: Integrated Coastal Management Act (No. 24 of 2008)
- q) Sea-Shore Act (No. 21 of 1935)
- r) National Veld and Forest Fire Act (No. 101 of 1998)
- s) Mineral and Petroleum Resources Development Act (No. 28 of 2002)
- t) National Parks (Act 57 of 1976) repealed by the NEMA Protected Areas Act (No. 57 of 2003)
- u) Environment Conservation Act (No. 73 of 1989) (Noise Control Regulations)

5. ADMINISTRATION OF ENVIRONMENTAL OBLIGATIONS

Copies of this Particular Specifications EMA, forming part of contract documentation, shall be kept at the site office and must be distributed to all senior contract personnel who must familiarise themselves with its contents.

Implementation of this document requires the involvement of several stakeholders, each fulfilling a different but vital role as outlined herein, to ensure sound environmental management during the construction phase of a project.

a) The Employer

The Employer is the holder of Environmental Authorisation(s) issued by the relevant competent regulating authorities. Compliance with the requirements of the various Authorisations is the responsibility of the Employer. Anyone acting on the Employer's behalf is accountable for the compliance with the Authorisation and to manage potential impacts of the activities.

b) The Engineer

The Engineer is the person appointed by the Employer, who acts as the Employer's on-site implementing agent and carries the responsibility to ensure that the Contractor undertakes construction activities in such a way as to not contravene the requirements set out in the Environmental Authorisation(s) issued for the contract.

c) The Contractor

The Contractor is responsible for project delivery in accordance with the prescribed contract data, among which this Particular Specifications EMA shall be included.

The Contractor shall receive and implement any instruction issued by the Engineer relating to compliance with the Particular Specifications EMA including the removal of personnel or equipment.

Compliance with the provisions contained herein or any condition imposed by the environmental approvals shall become the responsibility of the contractor through an approved ESO. The Contractor shall nominate a person from among his site personnel to fulfil this function and submit to the Engineer for his approval the curriculum vitae of the proposed ESO. This request for approval shall be given, in writing, at least fourteen days before the commencement of any construction activity clearly setting out reasons for the nomination, and with sufficient detail to enable the Engineer to make a decision.

d) The Environmental Site Officer (ESO)

Once a nominated representative of the Contractor has been approved he/she shall become the ESO and shall be the responsible person for ensuring that the provisions of this Particular Specifications EMA are complied with during the life of the contract. The ESO shall submit regular written reports to the Engineer, but not less frequently than once a month.

As a minimum the ESO shall have an accredited tertiary qualification in environmental or natural sciences or equivalent. Alternatively, the ESO shall have a minimum of 2 years' experience in a similar role in construction or other environmental regulatory field.

[Note to Compiler: the environmental sensitivity of the project will dictate whether the approved ESO should be able to assume other construction duties, or should be a dedicated officer with no other encumbrances. Such decisions will need to be made in conjunction with the relevant project manager and the Appendix to Tender appropriately completed]

(e) Environmental Control Officer (ECO)

The Environmental Control Officer (ECO) is an independent environmental specialist nominated by the Engineer to objectively and regularly monitor the contractor's implementation of this Particular Specifications EMA and the Environmental Management Programme (EMPr) as may be determined by the sensitivity of the project or by conditions of authorisations. The ECO will act as the Engineer's representative and will report to the relevant authority in a format as prescribed in NEMA 2014 Regulations. The ECO will have the authority to appoint any specialist to conduct an audit and advise on contraventions as deemed reasonable.

6. REQUIREMENTS

6.1 Materials

6.1.1 Materials handling, use and storage

[Note to Compiler: Take note that material storage and offloading requires allowance for a 15m turning circle and storage area. Make sure access roads exist and that vehicles can access in wet conditions. Damage is mostly done by subcontractors. Off-site personnel require additional control measures to limit impact. Pay attention to laydown areas and that these are planned into the site establishment]

The Contractor shall ensure that any delivery drivers are informed of all procedures and restrictions (including "no go" areas) required to comply with the Specifications. The Contractor shall ensure that these delivery drivers are supervised during off loading, by someone with an adequate understanding of the requirements of the Specifications.

Materials shall be appropriately secured to ensure safe passage between destinations. Loads including, but not limited to sand, stone chips, fine vegetation, refuse, paper and cement, shall have appropriate cover to prevent them spilling from the vehicle during transit. The Contractor shall be responsible for any clean-up resulting from the failure by his employees or suppliers to properly secure transported materials.

6.1.2 Hazardous substances

[Note to Compiler: Take note of alternatives for storage of small quantities of materials i.e. river sand is a good medium to collect or retain spills. The contractor will need to have dedicated spill kits consisting of a dry river sand and wood mixture for this purpose. Spill kits are to be stored in a dry place in geotextile sand bags. Sand bags are to be used under vehicles to retain spills.]

The contaminated sand mix is to be stored in a bund and at the end of the contract the ECO shall advise on what needs to happen to this contaminated sand mixture]

Procedures detailed in the Material Safety Data Sheets (MSDSs) of all hazardous substances shall be followed in the event of an emergency situation.

Petroleum, chemicals, harmful and hazardous waste shall be stored in an enclosed and bunded area. This area shall be subject to the approval of the Engineer. The waste shall be disposed of at a hazardous waste disposal site as approved by the Engineer.

6.1.3 Shutter oil and curing compound

[Note to Compiler: This is only relevant when formwork or extensive concrete work is in place. It may be removed if not needed]

Shutter oil and curing compound pose a risk of causing water and soil contamination and accordingly are regarded as potential hazardous substances. The Contractor shall ensure that shutter oil and curing compound containers in use are stored within the fuel bund. The remaining containers shall be inspected regularly to ensure that no leakage occurs. When shutter oil or curing compound is dispensed, the proper dispensing equipment shall be used, and the storage container shall not be tipped in order to dispense the oil/compound. The dispensing mechanism of the shutter oil/curing compound storage container shall be stored in a waterproof container when not in use.

Shutter oil and curing shall be used in moderation and shall be applied under controlled conditions using appropriate equipment. The Contractor shall take all reasonable precautions to prevent accidental and incidental spillage during the application of these compounds.

In the event of shutter oil or curing compound spill, the source of the spillage shall be isolated, and the spillage contained. The Contractor shall clean up the spill, either by removing the contaminated soil or by the application of absorbent material in the event of a larger spill. Treatment and remediation of the spill area shall be undertaken to the reasonable satisfaction of the Engineer.

6.1.4 Bitumen

[Note to Compiler: Storage of bitumen containers is crucial. Take note that this may be removed if no bitumen is used during construction]

The Engineer shall be advised of the area that the Contractor intends using for the storage of bitumen drums/products. The storage area shall have a smooth impermeable concrete floor/sand boxes/an area which will be excavated after use. The floor shall be bunded and sloped towards a sump to contain any spillages of substances. The bund shall be inspected and emptied of spillages when necessary. The bund shall be closely monitored during rain events to ensure that it does not overflow.

6.2 Plant

6.2.1 Ablution facilities

[Note to Compiler: Take note that VIP toilettes could be applicable to sites in rural areas. These may be left for community use after construction has ceased. Consider requirements as per OHS Act, prevent duplication. Add or remove the following as applicable]

1. The Contractor shall ensure that all chemical toilets are secured by four anchor posts, driven 300mm into the soil and secured by two strands of 5mm wire looped through

- appropriately installed holds on the structure.
2. In sandy soil the Contractor shall ensure that all chemical toilets are secured by four anchor posts, consisting of sand bags buried to 300mm and secured by two strands of 5mm wire looped through appropriately installed holds on the structure.
 3. In Addition to toilets, the Contractor shall construct a dedicated urinal area as per drawing 6.1.2.

The Contractor shall ensure that no spillage occurs when the toilets are cleaned or emptied and that the contents are properly stored and removed from Site. Discharge of waste from toilets into the environment and burial of waste is strictly prohibited.

Washing, whether of the person or of personal effects, and acts of excretion and urination are strictly prohibited other than at the facilities provided.

6.2.2 Solid waste management

[Note to Compiler: Take note of requirements in terms of NEM:WA (59 of 2008). Consider alternative uses for building rubble i.e. Green Star Accredited Building sites might require building rubble. Limit disposal at Waste Sites by contractor, rather appoint dedicated Waste Management Companies for this purpose. No solid waste shall be allowed to accumulate on site and needs to be removed on a daily basis]

The Contractor shall provide sufficient bins with lids on site to separate and store the solid waste produced on a daily basis. Solid, non-hazardous waste shall be disposed of in the bins provided and no on-site burying, dumping or burning of any waste materials, vegetation, litter or refuse shall occur. Bins shall not be allowed to become overfull and shall be emptied a minimum of once daily. Prior to closure of site all bins shall be emptied and the contents removed to an approved transfer facility. In case of an onsite transfer facility, waste may be temporarily stored on Site, for a period not exceeding one week in a demarcated waste transfer area that is weatherproof and scavenger-proof, and which the Engineer has approved in terms of relevant Guidelines for Waste transfer stations.

The Contractor shall take all necessary steps to reclaim waste for recycling and further use. The temporary storage facility should allow for separate storage for recyclable materials as required by the Engineer.

All solid waste and recycled material shall be disposed of off-site by an approved Sub-Contractor to a registered waste facility and/or recycle facility. The Contractor shall supply the Engineer with a certificate of disposal.

6.2.3 Contaminated water

[Note to Compiler: Compiler should take specific note of shallow water tables and proximity to rivers and streams, in which case the requirements shall be made more stringent. Insert Additional, depending on project]

The Contractor shall set up a contaminated water management system, which shall include collection facilities to be used to prevent pollution, as well as suitable methods of disposal of contaminated water. The Contractor shall prevent the discharge of water contaminated with any pollutants, such as soaps, detergent, cements, concrete, lime, chemicals, glues, solvents, paints and fuels, into the environment.

The Contractor shall notify the Engineer immediately of any pollution incidents on Site. The Engineer's approval is required prior to the discharge of contaminated water to the Municipal sewer system.

6.2.4 Site structures

[Note to Compiler: Take note of locality and proximity to neighbours, schools etc. Also take note if setting is more urban or rural and what is surrounding land-use in the area. Insert Additional, depending on project]

All site establishment components (as well as equipment) shall be positioned to limit visual intrusion on neighbours and the size of area disturbed. The type and colour of roofing and cladding materials to the Contractor's temporary structures shall be selected to reduce reflection and colours should be visually non-intrusive.

6.2.5 Noise control

[Note to Compiler: Take note of requirements as set in OHS, prevent duplication but take note when working near schools, residential areas or in rural settings where noise levels are usually below 45dB. Verify that the site is not located in one of the noise exclusion zones. If occurring in these "no-noise zones" then the following also needs to be raised: 6.2.8, 6.3.1, 6.3.4, 6.3.8, 6.3.9, 6.3.12, 6.3.13, 6.3.14, 6.3.15, 6.3.23, 6.3.24, 6.3.25, 6.3.26. Add or remove the following as applicable]

The applicable regulations framed under the Occupational Health and Safety Act (No. 85 of 1993) (OHS), and the provisions of SANS 1200 A Subclause 4.1 regarding "built-up areas" shall apply to all areas within audible distance of residents whether in urban, peri-urban or rural areas.

1. In addition to OHS the contractor will ensure any areas indicated as no noise zones (see drawings) be excluded from any noise activities.
2. In addition to OHS the contractor will ensure all necessary environmental sensitivity to noise are adhered to.
3. Appropriate directional and intensity settings are to be maintained on all hooters and sirens, and the Contractor shall provide and use suitable and effective silencing devices for pneumatic tools and other plant such that the noise level in inhabited areas and dwellings adjacent to the work areas will not increase by more than 7 dB(A)Leq 60 above residual background sound levels. Similarly in habituated areas adjacent to access roads maximum noise levels shall not exceed 60 dB(A)Leq 60 and maximum sound pressure level of 70 dB(A).

Where excess noise generation is unavoidable, the Contractor shall, by means of barriers, effectively isolate the source of any such noise in order to comply with the said regulations. The Contractor shall restrict any of his operations that may result in undue noise disturbance to those communities and dwellings abutting the Site to the hours of 08:00 to 17:00 on weekdays and Saturdays. No work will be permitted on Sundays unless otherwise agreed to with the Engineer.

No amplified music shall be allowed on Site. The use of radios, tape recorders, compact disc players, television sets etc shall not be permitted unless the volume is kept sufficiently low as to avoid any intrusion on members of the public within range. The Contractor shall not use sound amplification equipment on Site unless in emergency situations.

6.2.6 Lights

[Note to Compiler: Pay attention to type of lighting and possibility of generators that might cause noise. Recommend energy efficient lighting or lights that turn on or off with motion sensors. Insert Additional, depending on project]

The Contractor shall ensure that any lighting installed on the site for his activities does not interfere with road traffic or cause a reasonably avoidable disturbance to the surrounding community or other users of the area.

6.2.7 Fuel (petrol and diesel) and oil

[Note to Compiler: Verify that combined bulk storage facilities are approved in terms of NEMA Regulations should it exceed 80 000 liters. If the facility is managed by Petroleum Company verify that they applied for Authorisation. Add or remove the following as applicable]

The Contractor will not be allowed to store any fuel on site and must make relevant arrangements in this regard.

The Contractor may store fuel on site in an area approved by the Engineer. The Contractor shall ensure that all liquid fuels (petrol and diesel) are stored in approved tanks or in bowsters. The tanks/bowsters shall be situated on a smooth impermeable surface (concrete) with a constructed bund as per OHS. The bund shall be impermeable and the volume inside the bund shall allow for the total capacity of all the storage tanks/ bowsters plus additional as per OHS. The bunded area shall be covered to protect it from rain.

a) Re-fuelling:

1. Where reasonably practical, plant shall be refuelled at the depot or at the workshop as applicable. If it is not reasonably practical then the surface under the refuelling area shall be protected against pollution to the reasonable satisfaction of the Engineer prior to any refuelling activities.
2. Provision shall be made for refuelling at the fuel storage area, by protecting the soil with a concrete surface. The contractor shall take cognisance of the limits set by legislation for the storage of fuels and acquire the necessary authorisation for storage capacity beyond these. All fuel shall be stored in a secure area in steel tanks supplied and maintained by the fuel suppliers. An adequate bund wall, 110% of volume, shall be provided for fuel and diesel areas to accommodate any leakage spillage or overflow of these substances. Any leakage, spillage or overflow of fuel shall be attended to without delay.

b) Storage:

1. Gas welding cylinders and LPG cylinders shall be stored chained in a secure, well-ventilated area exterior to any building wall.
2. The Contractor shall prevent unauthorised access into the fuel storage area. No smoking shall be allowed within the vicinity of the fuel storage area. The Contractor shall ensure that there is adequate fire-fighting equipment at the fuel stores.

c) Maintenance:

1. Used oil, lubricants and cleaning materials from the maintenance of vehicles and machinery shall be collected in a holding tank (in workshop areas a dedicated oil trap and holding tank, as per drawing 6.2.7, shall be constructed to collect contaminated water and separate oil). Oils collected in this manner, shall be retained in a safe holding tank and removed from site by a specialist recycling company. Oil collected by a mobile servicing unit shall be stored in a dedicated container or tank and discharge into the holding tank for collection and removal by the specialist recycling company.
2. All used filters shall be stored in a secure bin for disposal off site. Any contaminated soil shall be removed and replaced. Soils contaminated by oils and lubricants shall be collected and disposed of at a facility designated by the local authority to accept contaminated materials or may be treated on site as per instructions from the ECO.

d) Spillage:

1. The Contractor shall be responsible for all spills on site. The Contractor shall have a

clear procedure in place to deal with spills. The Contractor shall contain the spill and immediately after discovering a spill report the incident to the Engineer. The Engineer will assess and advise on remediation and rehabilitation processes.

2. The Contractor shall rectify any pollution of a watercourse, including appointment of relevant specialist as agreed with the Engineer.

6.2.8 Workshop, equipment maintenance and storage

[Note to Compiler: Insert Additional, depending on project. Determine if workshop will be located in urban or rural area and adapt specification in accordance with environment. Verify that workshops and runoff are not directly linked to sewers or stormwater systems]

Leaking equipment shall be repaired immediately or removed from the Site. Where practical, all maintenance of equipment and vehicles on Site shall be performed off Site or in the workshop. If it is necessary to do maintenance outside of the workshop area, the Contractor shall obtain the approval of the Engineer prior to commencing activities. The Contractor shall ensure that in his workshop and other plant maintenance facilities, including those areas where, after obtaining the Engineer's approval, the Contractor carries out emergency plant maintenance, there is no contamination of the soil or vegetation. The workshop shall have a smooth impermeable (concrete) floor. The floor shall be bunded and sloped towards an oil trap or sump to contain any spillages of substances (e.g. oil).

When servicing equipment on site, drip trays or appropriate containers shall be used to collect the waste oil and other lubricants. Sand bags shall be provided in construction areas for stationary plant (such as compressors) and for "parked" plant (such as scrapers, loaders, vehicles). If drip trays are used they shall be inspected and emptied daily. Drip trays shall be closely monitored during rain events to ensure that they do not overflow. Where practical, the Contractor shall ensure that equipment is covered so that rainwater is excluded from the drip trays.

The washing of equipment shall be restricted to urgent or preventative maintenance requirements only. All washing shall be undertaken off Site or in the workshop. The use of detergents for washing shall be restricted to low phosphate and nitrate containing, low sudsing-type detergents.

6.2.9 Dust

[Note to Compiler: Take note that dust minimization measures are dependent on the availability of water. Take note of the soil conditions and the feasibility of dust minimisation measures for specific projects, in some instances dust is preferable to wasting water. If water is an issue in sandy areas, where dust is not normally an issue, investigate alternative suppression measures including organic mulch or grubbed material to prevent dust. Particle size and wind velocity are the most important factors to consider in dust generation. Wind breaks are only effective for the leeward area equivalent to twice the height of the break]

The Contractor shall take all reasonable measures to minimise the generation of dust as a result of construction activities to the satisfaction of the Engineer. The Contractor's dust management planning shall, as a minimum, take cognisance of the following:

- Schedule of spraying water on unpaved roads paying due attention to control of runoff.
- Speed limits for vehicles on unpaved roads and minimisation of haul distances.
- Measures to ensure that material loads are properly covered during transportation.
- Schedule for wheel cleaning and measures to clean up public roads that may be soiled by construction vehicles.

- Minimisation of the areas disturbed at any one time and protection of exposed soil against wind erosion, e.g. by dampening with water or covering with straw
- Location and treatment of material stockpiles taking into consideration prevailing wind directions and location of sensitive receptors.
- Controlled blasting techniques to minimise dust and fly rock during blasting.
- Adherence to the dust loads and protective gear stipulated in the Occupational Health and Safety Act.
- Reporting mechanism and action plan in case of excessive wind and dust conditions.
- The use of chemical or other stabilisation measures in case of water scarcity.

During summer, a water tanker shall be permanently available for the control of dust generation, and the Contractor shall ensure that the sprays do not generate excess run off. During winter, provision shall be made for a tanker, as required by the Engineer.

During high wind conditions, the Contractor shall comply with the Engineer's instructions regarding dust-dampening measures. The Engineer may request the temporary cessation of all construction activities where wind speeds are unacceptably high, and until such time as wind speeds return to acceptable levels.

As required by the Specification Data, the Contractors shall develop and implement a programme for the monitoring of dust fallout in areas where dust generation may be expected.

6.2.10 Bitumen plant

[Note to Compiler: Take note that this may be removed if no large capacity bitumen work on site]

The Engineer shall be advised of the area that the Contractor intends using for a bitumen plant. A site will need to be established for a bitumen plant and should be approached according to site establishment guidelines.

6.3 Methods and procedures

6.3.1 Method Statements

Any Method Statement required by this Specification, the Specification Data or the Engineer shall be produced within such reasonable time as is required by this Specification, the Specification Data or the Engineer. The Contractor shall not commence the activity until the Method Statement has been approved. Except in the case of emergency activities, the Contractor shall allow a period of 14 days for approval of the Method Statement by the Engineer. Such approval shall not be unreasonably withheld.

[Note to Compiler: Verify that the following is applicable, depending on project. Required MS may be reduced or increased depending on the nature of work and site conditions]

Method Statements in respect of environment management that shall be provided by the Contractor within 14 days of receipt of the letter of acceptance and prior to the activity covered by the Method Statement being undertaken, include:

- a) Location and structure of the fuel storage site, including the type and volume of storage container and the design and capacity of the bund.
- b) Solid waste (refuse) control and removal of waste from the Site, including the number, type and location of rubbish bins, the manner and frequency with which the waste will be removed from site and the disposal site.
- c) Contaminated water management system, including an indication of the source and

volume of contaminated water and how this would be disposed of.

- d) Dust control, including methods to prevent dust generation and methods to reduce dust where its generation is unavoidable.
- e) Location and layout of the construction camp in the form of a plan showing offices, stores for fuels and explosives, vehicle parking, access point, equipment cleaning areas and staff toilet placement.
- f) Location of proposed site access routes and proposed traffic safety measures.
- g) Emergency procedures for fire, and accidental leaks and spillages of hazardous materials.
- h) Location, layout and preparation of cement/ concrete batching facilities including the methods employed for the mixing of concrete and the management of runoff water from such areas. An indication shall be given of how concrete spoil will be minimised and cleared.
- i) Method of undertaking earthworks, including spoil management, erosion, dust and noise controls.
- j) Top material management and placement including rehabilitation planning. The contractor's programme shall clearly show the proposed rate of progress of the application of topsoil and grassing.
- k) Motivation and method for undertaking any construction related activities within a "no-go" area, including requisite emergency procedures. Unless need clearly motivated and proposed methodology exhibits clear focus on environmentally sensitive construction practice, no activity will be permitted within the defined "no-go" areas.

6.3.2 Environmental awareness training

[Note to Compiler: Take note that the training must accommodate a range of education levels, from the contractor to the labour force, and as such will need to be understood by all]

Within seven days of the Commencement Date, the Contractor's site staff including foremen and site management staff shall attend an environmental awareness training course, of approximately one-hour duration. The Contractor shall liaise with the Engineer prior to the Commencement Date to fix a date and venue for the course. The Contractor shall provide a suitable venue with facilities as required by the Specification Data, and ensure that the specified employees attend the course.

No more than 20 people shall attend each course and the Contractor shall allow for sufficient sessions to train all personnel. Subsequent sessions shall be run for any new personnel coming onto site.

The environmental awareness training course shall be held in the morning during normal working hours. Any new employees coming on to site after the initial training course and the Contractor's suppliers and subcontractors shall also attend the course. Provision should also be made for quarterly refreshers courses to be undertaken during the course of the Contract. The Contractor shall ensure that all attendees sign an attendance register, and shall provide the Engineer with a copy of the attendance register the day after each course.

6.3.3 Construction personnel information posters

[Note to Compiler: Information posters may be obtained from LSRWUA Environmental Unit. Insert Additional, depending on project]

The Contractor shall erect and maintain information posters for the information of his employees depicting actions to be taken to ensure compliance with aspects of the Specifications. Such posters will be supplied by the Engineer and shall be erected at a location specified by the Engineer.

6.3.4 Site clearance

[Note to Compiler: Take note of the definition of Top material. The ECO must verify that all necessary permits are in place according to the specifications of the EA]

The Contractor shall ensure that the clearance of vegetation is restricted to that required to facilitate the execution of the Works. Site clearance shall occur in a planned manner, and cleared areas shall be stabilised as soon as possible. The detail of vegetation clearing shall be to the Engineer's approval. All cleared vegetation shall either be mulched and mixed into the topsoil stockpiles or windrows. The disposal of vegetation by burying or burning is prohibited without the requisite permit from the local authority.

The Contractor shall strip the Topmaterial within the working areas. The Topmaterial shall be stockpiled separately from subsoil and used for subsequent rehabilitation and revegetation. Topmaterial stockpiles shall not be compacted.

Should fauna be encountered during site clearance, earthworks shall cease until fauna have been safely relocated by a specialist.

6.3.5 Soil management

[Note to Compiler: Take note of the definition of Topmaterial. The ECO must verify that all necessary permits are in place according to the specifications of the EA]

a) Topsoil

The Contractor shall remove all Topmaterial from all areas where physical disturbance of the surface will occur in accordance with Specification 6.3.4. The areas to be cleared of topsoil shall include all storage areas. The Contractor shall maintain all stockpiles and windrows throughout the contract period in a weed-free condition. Weeds appearing on the stockpiled or windrowed topsoil shall be removed by hand.

The Contractor shall dispose of all contaminated soils as Specification 6.2.3. The Contractor shall shape and site stockpiles in such a way that they do not interfere with the flow of water to cause damming or erosion, or itself be eroded by the action of water (**Drawing 6.3.5.1 silt fencing or Drawing 6.3.5.2 bale protection**). Stockpiles left for longer than 6 months, shall be analysed, and if necessary upgraded on accordance with Specification EMRA/EMR.

The Contractor shall ensure that no Topmaterial is lost due to erosion. The Contractor shall plan and implement Topmaterial replacement and revegetation to accommodate weather and growth periods as agreed with the Engineer. The Contractor shall be held responsible for the replacement, at his own cost, for any unnecessary loss of topsoil due to his failure to work according to the progress plan approved by the engineer.

b) Subsoil

The subsoil is the layer of soil immediately beneath the topsoil. It shall be removed, to a depth instructed by the engineer, and if not used for road building it shall be stored and maintained separately from the Topmaterial.

6.3.6 Site division

[Note to Compiler: Locality and sensitivity of the area will be the deciding factor of whether this Specification will be more prescriptive, or ask for MS. Do not do both! If more prescriptive then remove point under 6.3.1. Insert Additional, depending on project]

The Engineer shall be advised of the area that the Contractor intends using for his site establishment. The Contractor's camp shall occupy as small an area as possible, and no site establishment shall be allowed within 50 m of any watercourse unless otherwise approved by the Engineer.

The Contractor shall inform the Engineer of the intended actions and programme for site establishment. The site layout shall be planned to facilitate ready access for deliveries, turning circles, facilitate future works and to curtail any disturbance or security implications for neighbours.

6.3.7 Site demarcation

[Note to Compiler: Same notes apply as for 6.3.8. Insert Additional, depending on project]

As required by the Specification Data, the Contractor shall erect and maintain permanent and/or temporary fences of the type and in the locations directed by the Engineer. Such fences shall, if so specified, be erected before undertaking designated activities.

6.3.8 "No go" areas

[Note to Compiler: Take note that danger tape is not adequate material for demarcation. Commercial barrier fencing is expensive and should be used with discernment. It is better to compile a drawing and issue the drawing in order for coordinates to be marked on the ground. If a drawing is issued revise requirements in 6.3.1 and the need for a MS. In this case it might be required to have a drawing and a MS depending on locality and sensitivity of the site. Update fines if needed]

Areas pointed by the ECO or as per **Drawing 6.3.8** shall be considered "no-go" areas. The Contractor shall ensure that, insofar as he has the authority, no unauthorised entry, stockpiling, dumping or storage of equipment or materials shall be allowed within the demarcated "no go" areas.

"No go" areas shall be demarcated with fencing consisting of wooden or metal posts at 3 m centres painted white. In cases of highly sensitive areas, or if agreed with the Engineer, "no-go" areas shall be demarcated with fencing consisting of wooden posts at 3 m centres with 1 plain wire strand tensioned horizontally at 900 mm from ground level. Commercially available barrier fencing shall be tied to the wire strand. The Contractor shall maintain the fence for the duration of construction and ensure that no part becomes dislodged.

6.3.9 Protection of natural features

[Note to Compiler: Verify that all permits for protection of natural features are in place. Drawings may be issued and linked with 6.3.8 if needed. Update fines if needed]

The Contractor shall not deface, paint, damage or mark any natural features (e.g. rock formations) situated in or around the Site for survey or other purposes unless agreed beforehand with the Engineer. Any features affected by the Contractor in contravention of this

clause shall be restored/ rehabilitated to the satisfaction of the Engineer.

The Contractor shall not permit his employees to make use of any natural water sources (e.g. springs, streams, open water bodies) for the purposes of swimming, personal washing and the washing of machinery or clothes.

6.3.10 Protection of flora and fauna

[Note to Compiler: Verify that all permits for the protection of flora and fauna are in place. Determine the necessity for MS and or remove from 6.3.1 if needed. Determine link with 6.3.8. Update fines if needed]

Except to the extent necessary for the carrying out of the Works, flora shall not be removed, damaged or disturbed nor shall any vegetation be planted without authorisation.

Trapping, poisoning and/ or shooting of animals is strictly forbidden. No domestic pets or livestock are permitted on Site.

Where the use of herbicides, pesticides and other poisonous substances has been specified, they shall be stored, handled and applied with due regard to their potential harmful effects.

6.3.11 Protection of archaeological and palaeontological remains

[Note to Compiler: Verify that all permits for the protection of archaeological and palaeontological remains are in place. As previous comment on 6.3.1 and 6.3.8. Update fines if needed]

The Contractor shall take reasonable precautions to prevent any person from removing or damaging any fossils, coins, articles of value or antiquity and structures and other remains of archaeological interest discovered on the Site, immediately upon discovery thereof and before removal. The Contractor shall inform the Engineer immediately of such a discovery and carry out the Engineers instructions for dealing therewith. All construction within the vicinity of the discovery shall cease immediately and the area shall be demarcated as a no-go area until such time as the Engineer authorises resumption of construction in writing.

The Engineer will contact the relevant heritage authority.

6.3.12 Access routes / haul roads

[Note to Compiler: Take note that roads are maintained in original condition. When driving off road, drivers must access from a single access point and stay on a single access route as approved by the Engineer. If needed additional fines to be added as driving over vegetation during growth season has long term damaging effects]

Access to the Construction camp and working areas shall utilise existing roads or tracks. Entry/exit points onto public roads shall take cognisance of traffic safety. Traffic safety measures shall include appropriate signage and signalmen where relevant.

On the Site, and, if so required by the Specification Data, within such distance of the Site as may be stated, the Contractor shall control the movement of all vehicles and plant including that of his suppliers so that they remain on designated routes, are distributed so as not to cause an undue concentration of traffic and that all relevant laws are complied with. In addition such vehicles and plant shall be so routed and operated as to minimise disruption to regular users of the routes not on the Site. On gravel or earth roads on Site and within 500 m of the Site, the vehicles of the Contractor and his suppliers shall not exceed a speed of equivalent to 20 km/h.

Aggregate, mud and sand deposited onto public roads by construction activities shall be cleared on a daily basis.

In case of a linear development or if no formal access road is required the Contractor will identify the access point and route, once the first vehicle has travelled this route the established tracks will become the dedicated tracks used for the project and vehicles may not deviate from these.

When using gravel roads the Contractor shall maintain the integrity of the gravel road by drafting an instrument consisting of heavy duty vehicle tyres behind an appropriate service vehicle on a weekly basis. Should any public or private road used by the Contractor deteriorate to the extent that it possesses a hazard to the public, the Contractor is to reinstate it to the original condition.

6.3.13 Cement and concrete batching

[Note to Compiler: Take note of soil type and the potential impact that cement and concrete batching will have on the soil pH. Housekeeping regarding cement and concrete batching is the Engineers responsibility, but impact on soil and water responsibility to be covered in this document]

Where applicable, the location of the batching plant (including the location of cement stores, sand and aggregate stockpiles) shall be as approved by the Engineer. The concrete/cement batching plant shall be kept neat and clean at all times.

No batching activities shall occur directly on unprotected ground. The batching plant shall be located on a smooth impermeable surface (concrete). The area shall be bunded and sloped towards a sump to contain spillages of substances. All wastewater resulting from batching of concrete shall be disposed of via the contaminated water management system and shall not be discharged into the environment. Contaminated water storage areas shall not be allowed to overflow and appropriate protection from rain and flooding shall be implemented

Empty cement bags shall be stored in weatherproof containers to prevent wind-blown cement dust and water contamination. Empty cement bags shall be disposed of on a regular basis via the solid waste management system, and shall not be used for any other purpose. Unused cement bags shall be stored so as not to be affected by rain or runoff events. In this regard, closed steel containers shall be used for the storage of cement powder and any additives. The Contractor shall ensure that sand, aggregate, cement or additives used during the mixing process are contained and covered to prevent contamination of the surrounding environment.

The Contractor shall take all reasonable measures to prevent the spillage of cement/ concrete during batching and construction operations. During pouring, the soil surface shall be protected as agreed with the Engineer and all visible remains of concrete shall be physically removed on completion of the cement/ concrete pour and appropriately disposed of. All spoiled and excess aggregate/ cement/ concrete shall be removed and disposed of via the solid waste management system.

Where "ready mix" concrete is used, the Contractor shall ensure that the delivery vehicles do not wash their chutes at designated areas constructed for this purpose. Any spillage resulting from the "ready mix" delivery shall be immediately cleared and disposed of via the solid waste management system.

6.3.14 Earthworks

[Note to Compiler: Verify if additional MS is required under 6.3.1. Take note of 6.2.9, 6.2.5, 6.3.8, 6.3.9 & 6.3.10. Insert Additional, depending on project]

All earthworks shall be undertaken in such a manner so as to minimise the extent of any impacts caused by such activities, particularly with regards to erosion and dust generation. No equipment associated with earthworks shall be allowed outside of the Site and defined access routes unless expressly permitted by the Engineer.

6.3.15 Pumping

[Note to Compiler: Take note that necessary WULA are in place and the locality next to watercourses. Insert Additional, depending on project]

Pumps shall be placed over a drip tray in which a 5 mm plaster sand layer has been placed in order to contain fuel spills and leaks. The Contractor shall take all reasonable precautions to prevent spillage during the refuelling of these pumps.

The Contractor shall ensure that none of the water pumped during any dewatering activities, including well points, is released into the environment without the Engineer's approval. The Engineer's approval is required prior to the discharge of this water into the Municipal sewer system.

6.3.16 Bitumen

[Note to Compiler: Insert Additional, depending on project]

Over spray of bitumen products outside of the road surface and onto roadside vegetation or the surrounding environment shall be prevented using a method approved by the Engineer.

When heating bitumen products, the Contractor shall take cognisance of appropriate fire risk controls. Heating of bitumen products shall only be undertaken using LPG or similar zero emission fuels and appropriate fire-fighting equipment shall be readily available.

Stone chip/gravel excess shall not be left on road/paved area verges. This shall be swept/raked into piles and removed to an area approved by the Engineer.

Water quality from runoff from new/fresh bitumen surfaces will be monitored visually by the Engineer and remedial actions taken where necessary by the Contractor.

6.3.17 Fire control

[Note to Compiler: Take note of the National Veld Forests Fire Act (Act No. 101 of 1998) when near a forested area]

No fires may be lit on site. Any fires that occur shall be reported to the Engineer immediately. Smoking shall not be permitted in those areas where it is a fire hazard. Such areas shall include the workshop and fuel storage areas and any areas where the vegetation or other material is such as to make liable the rapid spread of an initial flame. In terms of the National Environmental Management Air Quality Act (No. 39 of 2004) and LSRWUA by-laws, burning is not permitted as a disposal method.

The Contractor shall ensure that there is basic fire-fighting equipment available on Site at all times. This shall include at least rubber beaters when working in urban open spaces and fynbos areas, and at least one fire extinguisher of the appropriate type when welding or other "hot" activities are undertaken.

6.3.18 Emergency procedures

[Note to Compiler: Insert Additional, depending on project]

The Contractor's procedures for the following emergencies shall include:

a) Fire

The Contractor shall advise the relevant authority of a fire as soon as one starts and shall not wait until he can no longer control it. The Contractor shall ensure that his employees are aware of the procedure to be followed in the event of a fire.

b) Accidental leaks and spillages

The Contractor shall ensure that his employees are aware of the emergency procedure(s) to be followed for dealing with spills and leaks, which shall include notifying the Engineer and the relevant authorities. The Contractor shall ensure that the necessary materials and equipment for dealing with spills and leaks is available on Site at all times. Treatment and remediation of the spill areas shall be undertaken to the reasonable satisfaction of the Engineer.

In the event of a hydrocarbon spill, the source of the spillage shall be isolated, and the spillage contained. The area shall be cordoned off and secured. The Contractor shall ensure that there is always a supply of absorbent material readily available to absorb/ breakdown and where possible be designed to encapsulate minor hydrocarbon spillage. The quantity of such materials shall be able to handle a minimum of 200 l of hydrocarbon liquid spill.

6.3.19 Community relations and Safety

[Note to Compiler: make sure CLO is appointed or identified during EIA process to allow for continuity and understanding of the process. Ensure that CLO is independent with no political affiliation]

The Contractor shall erect and maintain information boards in the position, quantity, design and dimensions specified. Such boards shall include contact details for complaints by members of the public in accordance with details provided by the Engineer.

The Contractor shall keep a "Complaints Register" on Site. The Register shall contain all contact details of the person who made the complaint, and information regarding the complaint itself.

The Contractor shall ensure that at all times there is an adequate and safe path for pedestrians passing the site, if needed walkways must be constructed.

Should it be required, the Contractor shall appoint an unaffiliated, qualified and experienced Community Liaison Officer (CLO) to link with neighbouring I&APs.

6.3.20 Erosion and sedimentation control

[Note to Compiler: Insert Additional, depending on project]

The Contractor shall take all reasonable measures to limit erosion and sedimentation due to the construction activities. Where erosion and/or sedimentation, whether on or off the Site, occurs despite the Contractor complying with the foregoing, rectification shall be carried out in accordance with details specified by the Engineer. Where erosion and/or sedimentation occur due to the fault of the Contractor, rectification shall be carried out to the reasonable requirements of the Engineer **as per Drawing 6.3.20.**

1. Any runnels or erosion channels developed during construction or during the defects liability period shall be backfilled and compacted. Stabilisation of cleared areas to prevent and control erosion shall be actively managed. Consideration and provision shall be made for various methods, namely, brushcut packing, mulch or chip cover, straw stabilising (at a rate of one bale/ 20 m² and rotovated into the top 100 mm of the completed earthworks), watering, soil binders and anti-erosion compounds,

mechanical cover or packing structures (e.g. Hessian cover).

2. If

Traffic and movement over stabilised areas shall be restricted and controlled, and damage to stabilised area shall be repaired and maintained to the satisfaction of the Engineer.

6.3.21 Aesthetics

[Note to Compiler: ECO should take photos of the area prior to construction commencement and ensure that the Contractor reinstates to appropriate levels without impacting and at no cost to the landowner]

The Contractor shall take reasonable measures to ensure that construction activities do not have an unreasonable impact on the aesthetics of the area.

The Contractor shall take necessary measures to ensure that landscaped areas are accepted and repaired in consultation with the relevant landowner or a Horticulturist from LSRWUA.

6.3.22 Recreation

[Note to Compiler: Insert Additional, depending on project]

If so required by the Specification Data, the Contractor shall take measures to reduce disruption to recreational users of the area abutting the Site.

6.3.23 Access to site

[Note to Compiler: Insert Additional, depending on project]

The Contractor shall ensure that access to the Site and associated infrastructure and equipment is off-limits to the public at all times during construction. If so required, as directed by the Engineer, the Contractor shall fence the site to ensure effective control of access to the site. This fence shall be a diamond mesh fence or similar with a minimum height of 1.8 m, and it shall be erected around the site and shall be maintained for the duration of construction.

6.3.24 Crane operations

[Note to Compiler: May be removed if not required, depending on project]

Drive plants shall be well maintained and drip trays shall be positioned at potential leak areas. Over-greasing of crane cables shall be avoided.

Movement and lifting of hazardous materials shall be undertaken such that they do not cause a pollution, spillage or safety risk (in particular where concrete buckets are in use).

6.3.25 Trenching

[Note to Compiler: Compiler should take note of working within required excavation depth and width. Excavation should also be for stockpile or topsoil, second stockpile for subsoil, work area, travelling way and laydown area for material]

Trenching for services shall be undertaken in accordance with the engineering specifications with the following environmental amplifications, where applicable:

- a) Soil shall be excavated and used for refilling trenches i.e. soil from the first trench shall be

excavated and stockpiled, thereafter soil from the second excavated trench length shall be used to backfill the trench behind it once the services have been laid. The last trench shall be filled using the soil stockpiled from the first trench.

- b) Trench lengths shall be kept as short as practically possible before backfilling and compacting.
- c) Trenches shall be re-filled to the same level as (or slightly higher to allow for settlement) the surrounding land surface to minimise erosion.
- d) Topsoil should be placed on top and not be compacted to allow for vegetation regrowth
- e) If needed safe crossings and pedestrian pathways should be allowed if the trenches cannot be closed within reasonable periods.

6.3.26 Demolition

[Note to Compiler: ECO to make sure notices are placed and photos to be taken of adjacent properties to record potential damages. Compiler to ensure that material is not deposited on landfill. Contact Waste Exchange to offset recycled material]

All safety requirements need to be adhered to in terms of OHSA.

If blasting is required the Contractor shall advise neighbours 14 days prior to commencement and again one day prior to demolition. Special warning is to be posted to pet owners about blasting schedules.

Hazardous and non-hazardous materials shall be separated at site and disposed of in a manner approved by the Engineer.

All buildings older than 60 years require a permit from South African Heritage Resources Agency in terms of the National Heritage Resources Act (No. 25 of 1999). A demolition permit is also required from the local authority in terms of the National Building Regulations.

The Contractor shall allow for recycling of material and crushing of concrete material should be applied on site as agreed with the Engineer.

6.3.27 Drilling and jack hammering

[Note to Compiler: Special care is to be taken in areas with natural features and in built up areas with strict adherence to the work hours. Check Specification 6.2.5 and update if necessary]

The Contractor shall take all reasonable measures to limit dust generation and noise as a result of drilling operations. The Contractor shall ensure that no pollution results from drilling operations, either as a result of oil and fuel drips, or from drilling fluid.

Any areas or structures damaged by the drilling and associated activities shall be rehabilitated by the Contractor to the satisfaction of the Engineer.

6.3.28 Stockpiling

[Note to Compiler: Windrows are a better way of storing material and should be used rather than stockpiling. Verify that Specification 6.3.5 is also updated in conjunction with this and the volume of material is also to be considered. A rule of thumb is that the stockpile will be approximately twice the width and depth of any excavation. Take into account that topsoil and spoil should be stored separately. Allow for testing and replacement of material. Keep seedbank intact as it limits rehabilitation costs. Refer to Specification EMRA for revegetation or EMR for rehabilitation]

The Contractor in conjunction with the Engineer will identify suitable sites for stockpiling. Stockpiles shall be convex in shape, shall be no higher than 2 m and shall be located so as to cause minimal disturbance. Where required, appropriate precautions shall be taken to prevent the erosion and limit the compaction of the stockpiles. The Contractor shall ensure that all stockpiles do not cause the damming of water, or is washed away.

6.3.29 Site closure and rehabilitation

[Note to Compiler: Add Specification EMR/EMRA if more detailed process is required. Depending on the area and work, rehabilitation should commence in phases and not wait until the end. Special attention to be paid to drought conditions and growth seasons when compiling the section]

Any areas that the Engineer believes may have been impacted upon or disturbed, shall be rehabilitated to the satisfaction of the Engineer, which includes all areas where Topmaterial has been stripped. Once construction is complete the Contractor shall clear everything from the Site not forming part of the Permanent Works. The area to be rehabilitated shall first be landscaped to match the topography of the surrounding area as it was prior to construction. The composition of vegetation to be used for any rehabilitation shall be as specified in the Specification Data.

The Contractor may not use herbicides, pesticides, fertilisers or other poisonous substances for the rehabilitation process unless otherwise agreed with the Engineer.

All rehabilitated areas shall be considered “no go” areas and the Contractor shall ensure that none of his staff or equipment enters these areas.

The Contractor shall undertake to remove all alien vegetation re-establishing on the area and shall implement the necessary temporary or permanent measures to combat soil erosion.

6.3.30 Temporary re-vegetation of the areas disturbed by construction.

[Note to Compiler: Refer to previous comments]

Where there is likely to be a delay of greater than two weeks in the landscaping and revegetation of a disturbed area or where that site is likely to be the subject of further construction activities at a later stage, the Contractor shall ensure that the area is temporarily revegetated to combat dust generation and prevent erosion. This revegetation shall occur incrementally immediately upon completion of the construction activities at the subject location.

Prior to revegetation structures and material not forming part of the Permanent Works, including remnants of building materials, concrete foundations, timber and other foreign debris, shall be removed and disposed of via the solid waste management system. The area shall be revegetated as follows:

- a) The surface shall be levelled by hand or machine as far as practically possible.
- b) Alien vegetation shall be cleared by cutting the plants off at ground level, and painting the stump with 0.5% Garlon in diesel.
- c) For areas with a slope of greater than 1:3, straw shall be utilised as a binding material to stabilise the soil during revegetation and rehabilitation of the site. Straw shall consist of natural, dried fibres of hay or chaff of various lengths between 50 mm and 400 mm, delivered to Site in bales and shall be applied evenly by hand or machine at a rate of 1 bale per 20 m² over the area to be revegetated. It shall then immediately be rotovated into the upper 100 mm layer of soil.
- d) The prepared area shall be hydro- or hand-seeded at a rate of 40 kg/ha using Rye grass (*Lolium multiflorum*). In the event of hand-seeding, the seed mixture as specified shall be mixed with two parts per volume of clean dry plaster sand, then divided in half and applied evenly in two successive applications, one after the other, by means of an

approved hand seeding machine (known colloquially as a “tefsaaier”). On completion of the seeding the surface shall be lightly raked to cover the seed with no more than 5 mm of soil.

- e) Water used for the irrigation of vegetated areas shall be free of pollutants that will have a detrimental effect on the plants. The vegetated area shall only be watered once, immediately following seeding. Watering should be carried out from a tanker, using a fine nozzle spray to avoid erosion and disturbance of the vegetation. Water for irrigation purposes may not be drawn from any water body.

No construction equipment, vehicles or unauthorised personnel shall be allowed onto areas that have been vegetated. Only persons or equipment required for the preparation of areas, application of fertiliser and maintenance of revegetated area shall be allowed to operate on these areas.

6.3.31 Temporary site closure

[Note to Compiler: This section especially applies when contract extends over the Christmas break period]

If the site is closed for a period exceeding one week, the Contractor, in consultation with the Engineer shall carry out the following checklist procedure.

Hazardous materials stores

Outlet secure / locked
Bund empty (where applicable)
Fire extinguishers serviced and accessible
Secure area from accidental damage e.g. vehicle collision
Emergency and contact details displayed
Adequate ventilation

Safety

All trenches and manholes secured
Fencing and barriers in place as per the Occupational Health and Safety Act (No 85 of 1193)
Emergency and management contact details displayed
Pipe stockpile wedged/ secured

Erosion

Wind and dust mitigation in place
Slopes and stockpiles at stable angle
Revegetated areas watering schedules and supply secured

Water contamination and pollution

Cement and materials stores secured
Toilets empty and secured
Refuse bins empty and secured
Drip trays empty and secure (where possible)
Structures vulnerable to high winds secure

7. COMPLIANCE WITH REQUIREMENTS AND PENALTIES

7.1 Compliance

Environmental management is concerned not only with the final results of the Contractor's operations to carry out the Works but also with the control of how those operations are carried out. Tolerance with respect to environmental matters applies not only to the finished product but also to the standard of the day-to-day operations required to complete the Works.

It is thus required that the Contractor shall comply with the environmental requirements on an

ongoing basis and any failure on his part to do so will entitle the Engineer to certify the imposition of a penalty as detailed below.

7.2 Penalties

Penalties will be issued for certain transgressions. Penalties may be issued per incident at the discretion of the Engineer. Such penalties will be issued in addition to any remedial costs incurred as a result of non-compliance with this Specification. The Engineer will inform the Contractor of the contravention and the amount of the penalty, and shall be entitled to deduct the amount from monies due under the Contract.

[Note to Compiler: Penalties should be negotiated in line with total allocated value of project. It is recommended that a lump sum be agreed and penalties deducted from that sum. The Sum will act as surety to appoint a subbie to rehabilitate in case of non-compliance, should contractor comply they may receive full sum. It is important that Project leader only pay amounts on written approval from ECO. Contractor responsibilities terminate on final closure report from ECO]

Fines for the activities detailed below, will be imposed by the Engineer on the Contractor.

a) Any employees, vehicles, plant, or thing related to the Contractor's operations operating within the designated boundaries of a "no-go" area.	R 10 000
b) Any vehicle driving in reckless manner.	R 1 000
c) Persistent and un-repaired oil leaks from machinery.	R 3 000
d) Persistent failure to monitor and empty drip trays timeously.	R 1 000
e) The use of inappropriate methods for refuelling.	R 1 000
f) Litter on site associated with construction activities.	R 1 000
g) Deliberate lighting of illegal fires on site.	R 5 000
h) Employees not making use of the site ablution facilities.	R 2 000
i) Failure to implement specified noise controls, particularly during blasting	R 2 000
j) Failure to manage waste bins on a regular basis.	R 1 000
k) Inadequate dust control.	R 1 000
l) A spillage, pollution, or any damage to any water course resulting from negligence on the part of the Contractor.	R10 000

For each subsequent similar offence the fine shall be doubled in value to a maximum value of R 100 000

The Engineer will determine what constitutes a transgression in terms of this clause, subject to the provisions of Clause 60(1) of the General Conditions of Contract. In the event that transgressions continue the Contractor's attention is drawn to the provisions of Sub-clause 58(1)(b)(vi) of the General Conditions of Contract under which the Engineer may cancel the Contract.

7.3 Removal from site and suspension of Works

The Engineer may instruct the Contractor to remove from Site any person(s) who in their opinion is guilty of misconduct, or is incompetent, negligent or constitutes an undesirable presence on Site. Subclause 9.2.1.3.4 of this Specification requires that all Plant be in good working order, and accordingly the Engineer may order that any Plant not complying with the Specifications be removed from Site. Subclause 9.2.1.3.5 states that where the Engineer deems the Contractor to be in breach of any of the requirements of this Specification, he may order the Contractor to suspend the progress of the Works or any part thereof.

8. VOID

9. VOID

10. MEASUREMENT AND PAYMENT

10.1 Basic principles

10.2 General

Except as specified below, or in the Specification Data or as billed, no separate measurement and payment will be made to cover the costs of complying with the provisions of this Specification and such costs shall be deemed to be covered by the rates tendered for the items in the Bill of Quantities completed by the Contractor when submitting his tender.

10.3 All requirements of the environmental management specification

All work not measured elsewhere, associated with complying with any requirement of this Environmental Management specification will be measured and paid as a sum.

The tendered sum shall cover the cost of with complying with the environmental management specification and shall include for all materials, labour and plant required to execute and complete the Works as specified, described in the Bill of Quantities or shown on the Drawing(s).

10.4 Work "required by the Specification Data"

Where a clause in this Specification includes a requirement as "required by the Specification Data", measurement and payment for compliance with that requirement shall be in accordance with the relevant measurement and payment clause of the Specification Data.

10.5 Billed items

10.5.1 Method Statements: Additional work

No separate measurement and payment will be made for the provision of Method Statements but, where the Engineer requires a change on the basis of his opinion that the proposal may result in, or carries a greater than warranted risk of damage to the environment in excess of that warranted by the Specifications, then any additional work required, provided it could not reasonably have been foreseen by an experienced contractor, shall be valued in accordance with the Clause in the General Conditions of Contract dealing with Provisional Sums.

A stated sum is provided in the Bill of Quantities to cover payment for such additional work.

10.5.2 All requirements of the environmental management specification

Unit: Sum

All other work not measured elsewhere, associated with complying with any requirement of the environmental management specification shall be measured as a sum.

The tendered rate shall cover any cost associated with complying with the environmental management specification and shall include for all materials, labour and plant required to execute and complete the work as specified, described in the Bill of Quantities or shown on the drawing(s).

[Note to Compiler: It is important to discuss with Project leader incorporation of additional pay items if needed]

10.5.3 Topmaterial: Additional work

- a) No separate measurement and payment will be made for the provision of Management, including replacement of top material but, where the Engineer requires a change on the basis of his opinion that the proposal may result in, or carries a greater than warranted risk of damage to the environment in excess of that warranted by the Specifications, then any additional work required, provided it could not reasonably have been foreseen by an experienced contractor, shall be valued in accordance with the Clause in the General Conditions of Contract dealing with Provisional Sums.
- b) A stated sum is provided in the Bill of Quantities to cover payment for such additional work.

Unit:

Sum

All other work not measured elsewhere, associated with complying with any requirement of the environmental management specification shall be measured as a sum.

The tendered rate shall cover any cost associated with complying with the management of top material specification and shall include for all materials, labour, plant and testing required to execute and complete the work as specified, described in the Bill of Quantities or shown on the drawing(s).

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APPENDIX A: APPLICABLE STANDARDS

Reference is made to the latest issues of the following standards:

SANS 1200 A	General
SANS 1200 AA	General (small works)
SANS 1200 C	Site clearance
SANS 1200 D	Earthworks
Specification AO	Occupational Health and Safety
Construction Regulations, 2015.	General conditions of contract for construction workers

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TENDER NO. **Insert project reference**

Insert Project Name

PARTICULAR SPECIFICATION EMB ENVIRONMENTAL MANAGEMENT (BASIC)

PARTICULAR SPECIFICATION EMB ENVIRONMENTAL MANAGEMENT (BASIC)

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USE OF THIS DOCUMENT

This is a generic Specifications and it should be used as a guide to compile a PARTICULAR SPECIFICATION BASIC (EMB) for a specific project to be included in the tender documentation for the Contractor. . A EMB would be necessary where there are specific issues with construction in the Coastal zone (due to the location or type of construction activities) that are not covered in the EMA or EMB Specifications. It is advisable that the Specifications be compiled by a Registered Landscape Architect or a team consisting of a Civil Engineer and an Environmental Specialist with a proven track record of 5 years dealing with infrastructure projects using this generic specifications as a guide.

It is of utmost importance that the following is noted:

- Only clauses that are relevant to the specific project must form part of the final EMC
- Under each clause in this particular specifications there are often a number of different possible options of how to deal with the issue at hand. These are numbered 1, 2, 3 etc. under the clause. It is of utmost importance that only the option/s relevant to the specific project is used in the EMC and the rest of the options are deleted. If parts of different options are relevant or none of the options are relevant then a new wording must be developed and used. **N.B. These options are only guidelines and must be taken as such and the developer compiling the EMC must adapt doc to reflect site conditions and Environmental Authorisation conditions this is not a cut and past exercise to be complete by a junior. This generic specification cannot just be used to develop a EMC without a good understanding of the project and the environmental issues.**
- o All comments in this document that are in italics, [square brackets] and highlighted as this section has been are comments helping with converting this generic Specifications into a Particular specification. **N.B. They should all be deleted from the final EMC as it is a legal document that must be stand alone and final.**
- o Be aware of the difference between
- o Consult the Compilation Document that details how a LSRWUA Particular Specification should be compiled for more details on how to use this document

PARTICULAR SPECIFICATION EMB ENVIRONMENTAL MANAGEMENT (BASIC)

1. SCOPE

This Specification covers the requirements for controlling the impact of construction activities on the environment. It contains clauses that are generally applicable to the undertaking of civil engineering works in areas where it is necessary to impose pro-active controls on the extent to which the construction activities impact on the environment.

This Particular specification, which forms an integral part of the contract documents, informs the contractor as to his duties in the fulfilment of the project objectives, with particular reference to the prevention and mitigation of environmental impacts caused by construction activities associated with the project. The contractor should note that obligations imposed by the Particular specification are legally binding in terms of this contract. In the event that any rights and obligations contained in this Particular specification contradict those specified in the standard or project specifications then the latter shall prevail.

2. NORMATIVE REFERENCES

2.1 Supporting Specifications

Where this Specification is required for a project the following specifications shall, inter alia, form part of the Contract Document.

- a) Specification Data;
- b) SANS 1200 Series of Standardized Specifications;
 - i) SANS 1200 A, SANS 1200 AA or SANS 1200 D as applicable;
- c) Specification AO (Occupational Health and Safety),
- d) Construction Regulations, 2010, and
- e) ¹Standards listed in Appendix A.

3. DEFINITIONS

For the purposes of this Specification the definitions and abbreviations given in the applicable specifications listed in 2.1 and the following definitions shall apply:

- Construction Activity** : Any action taken by the contractor, his sub-contractors, suppliers or personnel during the construction process as defined in the contract documents.
- Contaminated water** : Water contaminated by the Contractor's activities, e.g. concrete water and runoff from plant/ personnel wash areas.
- Environment** : The surroundings within which humans exist and that are made up of:
 - i) the land, water and atmosphere of the earth;
 - ii) micro-organisms, plant and animal life;
 - iii) any part or combination of i) and ii) and the interrelationships among and between them; and
 - iv) the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

Environmental Authorisation: A written statement from the National Department of

¹ See Appendix A

Environmental Affairs, (DEA), with the general and specific conditions and the EMPr recording its approval of an application for a planned undertaking that triggers listed activities in the Environmental Impact Assessment (EIA) regulations of the National Environmental Management Act (NEMA).

Method Statement : A written submission by the Contractor to the Engineer in response to the Specification or a request by the Engineer, setting out the plant, materials, labour and method the Contractor proposes using to carry out an activity, identified by the relevant specification or the Engineer when requesting the Method Statement, in such detail that the Engineer is enabled to assess whether the Contractor's proposal is in accordance with the Specifications and/or will produce results in accordance with the Specifications.

The Method Statement shall cover applicable details with regard to:

- Construction procedures;
- Materials and equipment to be used;
- Transportation of equipment/materials to and from site;
- Movement of equipment/material on site;
- Storage of materials on site;
- Containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- Timing and location of activities;
- Areas of non-compliance with the Specifications; and
- Any other information deemed necessary by the Engineer.

Potentially hazardous Substance : A substance that, in the reasonable opinion of the Engineer, can have a deleterious effect on the environment as contemplated in South African National Standard (SANS 10234).

Reasonable : Unless the context indicates otherwise, reasonable in the opinion of the Engineer after he has consulted with a person, not an Employee of the Employer, suitably experienced in "environmental implementation plans" and "environmental management programmes" (both as defined in NEMA 107 of 1998 and NEMA 2014 Regulations).

Solid waste : All solid waste, including, chemical waste, wrapping materials, food and domestic waste (e.g. plastic packets and wrappers) but exclude construction debris, excess cement/ concrete, timber, tins and cans, drums, wire, nails.

Water Course : (a) a river or spring;
 (b) a natural channel or depression in which water flows regularly or intermittently;
 (c) a wetland, lake or dam into which, or from which, water flows; and

- (d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse as defined in the National Water Act, 1998 (Act No. 36 of 1998). A reference to a watercourse includes, where relevant, its bed and banks.

Wetland : land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.

(Note to Compiler: Insert additional definitions, depending on project)

4. LEGAL REQUIREMENTS

Construction shall be according to the best industry practices, as identified in the project documents.

4.1 Statutory and other applicable legislation

In addition to this particular specification it is necessary for the Contractor to be conversant with all legislation pertaining to the environment, including provincial and local government ordinances, which may be applicable to the contract.

[Note to Compiler: Insert additional or remove legislation as applicable]

Major environmental legislation, as amended from time to time, includes but is not limited to the following:

- a) The Constitution Act (No. 6 of 1996)
- b) National Environmental Management Act (NEMA) (No. 107 of 1998)
- c) National Environmental Management: Air Quality Act (No. 39 of 2004) and Atmospheric Pollution Prevention Act (No. 45 of 1965)
- d) National Environmental Management: Biodiversity Act (No. 10 of 2004)
- e) National Environmental Management: Protected Areas Act (No. 57 of 2003)
- f) National Environmental Management: Waste Act (No. 59 of 2008)
- g) National Forests Act (No. 84 of 1998)
- h) National Heritage Resources Act (No. 25 of 1999)
- i) National Water Act (No. 36 of 1998)
- j) Conservation of Agricultural Resources Act (No. 43 of 1983)
- k) Mineral and Petroleum Resources Development Act (No. 28 of 2002).
- l) Environment Conservation Act (No. 73 of 1989)
- m) National Environmental Management: Biodiversity Act (No. 10 of 2004)
- n) National Environmental Management: Waste Act (No. 59 of 2008)
- o) Mineral and Petroleum Resources Development Act (No. 28 of 2002)
- p) National Environmental Management: Integrated Coastal Management Act (No. 24 of 2008)
- q) Sea-Shore Act (No. 21 of 1935)
- r) National Veld and Forest Fire Act (No. 101 of 1998)
- s) Mineral and Petroleum Resources Development Act (No. 28 of 2002)
- t) National Parks (Act 57 of 1976) repealed by the NEMA Protected Areas Act (No. 57 of 2003)
- u) Environmental Conservation Act (No. 73 of 1989) (Noise Control Regulations)

5. ADMINISTRATION OF ENVIRONMENTAL OBLIGATIONS

Copies of this Particular Specifications EMB shall be kept at the site office and must be distributed to all senior contract personnel who shall familiarise themselves with its contents.

Implementation of this document requires the involvement of several stakeholders, each fulfilling a different but vital role as outlined herein, to ensure sound environmental management during the construction phase of a project.

(a) The Employer

The Employer is the holder of authorisations issued by the relevant environmental regulating authorities responsible for authorising and enforcing environmental compliance. The Employer and anyone acting on the Employer's behalf is accountable for the potential impacts of the activities that are undertaken and is responsible for managing these impacts.

(b) The Engineer

The engineer has been appointed by, and acts for, the Employer as its on-site implementing agent and carries the responsibility to ensure that the contractor undertakes its construction activities in such a way that the Employer's environmental responsibilities are not compromised.

The engineer will, within seven days of receiving a contractor's request for approval of a nominated Environmental Site Officer (ESO), approve, reject or call for more information on the nomination. The engineer will be responsible for issuing instructions to the ESO where environmental considerations call for action to be taken.

If in the opinion of the engineer the ESO is not fulfilling his/her duties in terms of this Particular Specifications EMB, the engineer may, in writing and clearly setting out reasons, exercise his powers under FIDIC condition of contract clause 6.9 and instruct replacement of the ESO.

(c) The Contractor

The contractor is responsible for project delivery in accordance with the prescribed specifications, among which this EMP shall be included.

The contractor shall receive and implement any instruction issued by the engineer relating to compliance with the EMP including the removal of personnel or equipment.

Compliance with the provisions contained herein or any condition imposed by the environmental approvals shall become the responsibility of the contractor through an approved Environmental Site Officer (ESO). The contractor shall nominate a person from among his site personnel to fulfil this function and submit to the engineer for his approval the curriculum vitae of the proposed ESO. This request for approval shall be given, in writing, at least fourteen days before the commencement of any construction activity clearly setting out reasons for the nomination, and with sufficient detail to enable the engineer to make a decision.

(d) The Environmental Site Officer (ESO)

Once a nominated representative of the contractor has been approved he/she shall become the ESO and shall be the responsible person for ensuring that the provisions of this EMP are complied with during the life of the contract. The ESO shall submit regular written reports to the engineer, but not less frequently than once a month.

The ESO may undertake other construction duties unless the Appendix to Tender prescribes this position as 'dedicated' as opposed to the standard position being 'designated'. However,

the ESO's environmental duties shall hold primacy over other contractual duties and the engineer has the authority to instruct the contractor to reduce the ESO's other duties or to replace the ESO if, in the engineer's opinion, he/she is not fulfilling his/her duties in terms of the requirements of this EMB. Such instruction will be in writing clearly setting out the reasons why a replacement is required.

As a minimum the ESO shall have an accredited diploma qualification in environmental or natural sciences or equivalent. Alternatively, the ESO shall have a minimum of 2 years' experience in a similar role in construction or other environmental regulatory field.

As a minimum the ESO shall have an accredited tertiary qualification in environmental or natural sciences or equivalent. Alternatively, the ESO shall have a minimum of 2 years' experience in a similar role in construction or other environmental regulatory field.

[Note to Compiler: the environmental sensitivity of the project will dictate whether the approved ESO should be able to assume other construction duties, or should be a dedicated officer with no other encumbrances. Such decisions will need to be made in conjunction with the relevant project manager and the Appendix to Tender appropriately completed]

(e) Environmental Control Officer (ECO)

(e) Environmental Control Officer (ECO)

The Environmental Control Officer (ECO) is an independent environmental specialist appointed by the engineer to objectively and regularly monitor the contractor's implementation of this EMB and the EMP as may be determined by the sensitivity of the project or by conditions of authorisations. These are 'internal' audits and the regularity determined by the environmental approvals, usually once a month. Other ad hoc or 'external' audits ordered by the Employer will be conducted by other environmental specialists...

6. REQUIREMENTS

6.1 Materials

6.1.1 Materials handling, use and storage

Note to Compiler: Consider that material storage and offloading require allowance for 15m turning circle and storage area. Make sure access roads exist and that vehicles can access in wet conditions. Damage mostly done by subcontractors and off site personnel, add control measures to limit impact.

The Contractor shall ensure that any delivery drivers are informed of all procedures and restrictions (including "no go" areas) required to comply with the Specifications. The Contractor shall ensure that these delivery drivers are supervised during off loading, by someone with an adequate understanding of the requirements of the Specifications.

Materials shall be appropriately secured and covered to ensure safe passage between destinations. The Contractor shall be responsible for any clean-up resulting from the failure by his Employees or suppliers to properly secure transported materials.

(Note to Compiler: Insert Additional, depending on project)

6.1.2 Hazardous substances

Note to Compiler: Consider alternative for storage of small quantities of materials. River sand is good medium to collect spills as long as it is

contained in an impermeable container.

Hazardous chemical substances (as defined in the Regulations for Hazardous Chemical Substances) used during construction shall be stored in secondary containers. Refer to SANS 10228.

Procedures detailed in the Materials Safety Data Sheets (MSDS) shall be followed in the event of an emergency situation.

Potentially hazardous substances shall be stored, handled and disposed of as prescribed by the Engineer.

6.2 Plant

6.2.1 Ablution facilities

Note to Compiler: Consider requirements as per OHS Act, prevent duplication.

The Contractor shall ensure that no spillage occurs when the toilets are cleaned or emptied and that the contents are properly stored and removed from Site. Discharge of waste from toilets into the environment and burial of waste is strictly prohibited.

Washing, whether of the person or of personal effects and acts of excretion and urination are strictly prohibited other than at the facilities provided.

6.2.2 Solid waste management

Note to Compiler: Take note of requirements in terms of NEM:WA (59 of 2008). Consider alternative uses for building rubble i.e. Green Star Accredited Building sites might require building rubble. Limit disposal at Waste Sites by contractor, rather appoint dedicated Waste Management Companies for this purpose)

Contractor shall sufficient bins with lids that are secured to the bin no further than 50m from any working area. No on-site burying, dumping or burning of any waste materials, vegetation, litter or refuse shall occur. Bins shall be emptied a minimum of once daily. The waste may be temporarily stored on Site in a central waste area in a container that is weatherproof and scavenger-proof, as approved by the Engineer. The Contractor shall appoint a Waste Management Service Provider to manage their container(s).

The Contractor shall implement recycling initiatives to limit the volumes of waste produced, including to find alternative uses for all building material and spoil generated on the site.

All solid waste shall be disposed off site at an approved landfill site. The Contractor shall supply the Engineer with a certificate of disposal.

6.2.3 Contaminated water

[Note to Compiler: Compiler should take specific note of shallow water tables and proximity to rivers and streams, in which case the requirements shall be made more stringent. Insert Additional, depending on project]

Contractor shall set up a contaminated water management system, which shall include collection facilities, as well as suitable methods of disposal of contaminated water. The Contractor shall prevent the discharge of water contaminated with any pollutants, into the environment.

The Contractor shall notify the Engineer immediately of any pollution incidents on Site. The Engineer's approval is required prior to the discharge of contaminated water to the Municipal sewer system.

6.2.4 Noise

Note to Compiler: Take note of requirements as set in OHS Act, prevent duplication but take note when working near schools, residential areas or in rural settings where noise levels are usually below 45dB.

The Contractor shall limit noise levels (e.g. install and maintain silencers on machinery). The provisions of SANS 1200 A Subclause 4.1 regarding "built-up areas" shall apply to all areas within audible distance of residents whether in urban, peri-urban or rural areas.

Appropriate directional and intensity settings are to be maintained on all hooters and sirens and no amplified music shall be allowed on Site other than in emergency situations.

The Contractor shall restrict any of his operations that may result in undue noise disturbance to the hours of 08:00 to 17:00 on weekdays and Saturdays. Unless otherwise agreed to with the Engineer.

6.2.5 Fuel (petrol and diesel) and oil

[Note to Compiler: Verify that combined bulk storage facilities are approved in terms of NEMA Regulations should it exceed 80 000 liters. If the facility is managed by Petroleum Company verify that they applied for Authorisation. Add or remove the following as applicable].

The Contractor will not be allowed to store any fuel on site and must make relevant arrangements in this regard.

The Contractor may store fuel on site in an area approved by the Engineer. The Contractor shall ensure that all liquid fuels (petrol and diesel) are stored in approved tanks or in bowzers. The tanks/bowzers shall be situated on a smooth impermeable surface (concrete) with a constructed bund as per OHS. The bund shall be impermeable and the volume inside the bund shall allow for the total capacity of all the storage tanks/ bowzers plus additional as per OHS. The bunded area shall be covered to protect it from rain.

a) Re-fuelling:

1. Where reasonably practical, plant shall be refuelled at the depot or at the workshop as applicable. If it is not reasonably practical then the surface under the refuelling area shall be protected against pollution to the reasonable satisfaction of the Engineer prior to any refuelling activities.

2. Provision shall be made for refuelling at the fuel storage area, by protecting the soil with a concrete surface. The contractor shall take cognisance of the limits set by legislation for the storage of fuels and acquire the necessary authorisation for storage capacity beyond these. All fuel shall be stored in a secure area in steel tanks supplied and maintained by the fuel suppliers. An adequate bund wall, 110% of volume, shall be provided for fuel and diesel areas to accommodate any leakage spillage or overflow of these substances. Any leakage, spillage or overflow of fuel shall be attended to without delay.

b) Storage:

1. Gas welding cylinders and LPG cylinders shall be stored chained in a secure, well-ventilated area exterior to any building wall.

2. The Contractor shall prevent unauthorised access into the fuel storage area. No smoking shall be allowed within the vicinity of the fuel storage area. The Contractor shall ensure that there is adequate fire-fighting equipment at the fuel stores.

c) Maintenance:

1. Used oil, lubricants and cleaning materials from the maintenance of vehicles and machinery shall be collected in a holding tank (in workshop areas a dedicated oil trap and holding tank, as per drawing 6.2.7, shall be constructed to collect contaminated water and separate oil). Oils collected in this manner, shall be retained in a safe holding tank and removed from site by a specialist recycling company. Oil collected by a mobile servicing unit shall be stored in a dedicated container or tank and discharge into the holding tank for collection and removal by the specialist recycling company.
2. All used filters shall be stored in a secure bin for disposal off site. Any contaminated soil shall be removed and replaced. Soils contaminated by oils and lubricants shall be collected and disposed of at a facility designated by the local authority to accept contaminated materials or may be treated on site as per instructions from the ECO.

d) Spillage:

1. The Contractor shall be responsible for all spills on site. The Contractor shall have a clear procedure in place to deal with spills. The Contractor shall contain the spill and immediately after discovering a spill report the incident to the Engineer. The Engineer will assess and advise on remediation and rehabilitation processes.
2. The Contractor shall rectify any pollution of a watercourse, including appointment of relevant specialist as agreed with the Engineer.

6.2.6 Equipment maintenance and storage

[Note to Compiler: Insert Additional, depending on project. Determine if workshop will be located in urban or rural area and adapt specification in accordance with environment. Verify that workshops and runoff are not directly linked to sewers or stormwater systems]

Leaking equipment shall be repaired immediately or removed from the Site. Where practical, maintenance of plant shall not occur on site. Where emergency maintenance is necessary, the Contractor shall ensure that this does not result in contamination of the soil or vegetation. Drip trays shall be provided in construction areas for stationary and "parked" plant as well as during emergency servicing of vehicles. Drip trays shall be inspected and emptied daily. The contents of drip trays shall be disposed off at an authorised facility. Drip trays shall be closely monitored during rain events to ensure that they do not overflow.

The washing of equipment shall be restricted to urgent or preventative maintenance requirements only. The use of detergents for washing shall be restricted to low phosphate and nitrate containing, low sudsing-type detergents.

6.3 Methods and procedures

6.3.1 Method Statements

Any Method Statement required by this Specification, the Engineer or the Specification Data shall be produced within such reasonable time as is required by this Specification, the Engineer or the Specification Data. The Contractor shall not commence the activity until the Method Statement has been approved. Except in the case of emergency activities, the Contractor shall allow a period of two weeks for approval of the Method Statement by the Engineer. Such approval shall not unreasonably be withheld.

Note to Compiler: [Note to Compiler: Verify that the following is applicable, depending on project. Required MS may be reduced or increased depending on the nature of work and site conditions]

Method Statements in respect of environmental management that shall be provided by the Contractor within 14 days of receipt of the letter of acceptance and prior to the activity covered by the Method Statement being undertaken, include:

- 1) Location and structure of the fuel storage site, including the type and volume of storage container and the design and capacity of the bund.
- 2) Solid waste (refuse) control and removal of waste from the Site, including the number, type and location of rubbish bins, the manner and frequency with which the waste will be removed from site and the disposal site.
- 3) Contaminated water management system, including an indication of the source and volume of contaminated water and how this would be disposed of.
- 4) Emergency procedures for fire, and accidental leaks and spillages of hazardous materials.

(Note to Compiler: Insert Additional depending on project)

6.3.2 Environmental awareness training

Within seven days of the Commencement Date, the Contractor's site staff including foremen and site management staff shall attend an environmental awareness training course, of approximately one-hour duration. The Contractor shall liaise with the Engineer prior to the Commencement Date to fix a date and venue for the course. The Contractor shall provide a suitable venue with facilities as required by the Specification, Data and ensure that the specified employees attend the course.

Note to Compiler: [Note to Compiler: Take note that the training must accommodate a range of education levels, from the contractor to the labour force, and as such will need to be understood by all]

6.3.3 Construction personnel information posters

Note to Compiler: Information posters may be obtained from LSRWUA Environmental Unit. Insert Additional, depending on project]

As required by the Specification Data, the Contractor shall erect and maintain information posters for the information of his employees depicting actions to be taken to ensure compliance with aspects of the Specifications. Such posters will be supplied by the Engineer

and shall be erected at a location specified by the Engineer.

6.3.4 Site clearance

Note to Compiler: [Note to Compiler: Take note of the definition of Top material. The ECO must verify that all necessary permits are in place according to the specifications of the EA

The Contractor shall ensure that the clearance of vegetation is restricted to that required to facilitate the execution of the Works. Site clearance shall occur in a planned manner, and cleared areas shall be stabilised as soon as possible. The detail of vegetation clearing shall be to the Engineer's approval. All cleared vegetation shall either be mulched and mixed into the topsoil stockpiles or windrows. The disposal of vegetation by burying or burning is prohibited without the requisite permit from the local authority.

The Contractor shall strip the Topmaterial within the working areas. The Topmaterial shall be stockpiled separately from subsoil and used for subsequent rehabilitation and revegetation. Topmaterial stockpiles shall not be compacted.

Should fauna be encountered during site clearance, earthworks shall cease until fauna have been safely relocated by a specialist.

6.3.5 Soil management

Note to Compiler: Take note of the definition of Topmaterial. The ECO must verify that all necessary permits are in place according to the specifications of the EA

i) Topsoil

The Contractor shall remove all Topmaterial from all areas where physical disturbance of the surface will occur in accordance with Specification 6.3.4. The areas to be cleared of topsoil shall include all storage areas. The Contractor shall maintain all stockpiles and windrows throughout the contract period in a weed-free condition. Weeds appearing on the stockpiled or windrowed topsoil shall be removed by hand.

The Contractor shall dispose of all contaminated soils as Specification 6.2.3. The Contractor shall shape and site stockpiles in such a way that they do not interfere with the flow of water to cause damming or erosion, or itself be eroded by the action of water (Drawing 6.3.5.1 silt fencing or Drawing 6.3.5.2 bale protection). Stockpiles left for longer than 6 months, shall be analysed, and if necessary upgraded on accordance with Specification EMRA/EMR.

The Contractor shall ensure that no Topmaterial is lost due to erosion. The Contractor shall plan and implement Topmaterial replacement and revegetation to accommodate weather and growth periods as agreed with the Engineer. The Contractor shall be held responsible for the replacement, at his own cost, for any unnecessary loss of topsoil due to his failure to work according to the progress plan approved by the engineer. .

b) Subsoil

The subsoil is the layer of soil immediately beneath the topsoil. It shall be removed, to a depth instructed by the engineer, and if not used for road building it shall be stored and maintained separately from the Topmaterial.

6.3.6 Site division and Site demarcation

Note to Compiler: Locality and sensitivity of the area will be the deciding factor of whether this Specification will be more prescriptive, or ask for

*MS. Do not do both! If more prescriptive then remove point under 6.3.1.
Insert Additional, depending on project*

The Contractor shall restrict all his activities, materials, equipment and personnel to within the area specified. As required by the Specification Data, the Contractor shall erect and maintain permanent and/ or temporary fences of the type and in the locations directed by the Engineer. Such fences shall, if so specified, be erected before undertaking designated activities.

6.3.7 Access routes/ haul roads

Note to Compiler: Take note that roads are maintained in original condition. When driving off road, drivers must access from a single access point and stay on a single access route as approved by the Engineer. If needed additional fines to be added as driving over vegetation during growth season has long term damaging effects

Access to the Construction camp and working areas shall utilise existing roads or tracks. Entry/exit points onto public roads shall take cognisance of traffic safety. Traffic safety measures shall include appropriate signage and signalmen where relevant.

On the Site, and, if so required by the Specification Data, within such distance of the Site as may be stated, the Contractor shall control the movement of all vehicles and plant including that of his suppliers so that they remain on designated routes, are distributed so as not to cause an undue concentration of traffic and that all relevant laws are complied with. In addition such vehicles and plant shall be so routed and operated as to minimise disruption to regular users of the routes not on the Site. On gravel or earth roads on Site and within 500 m of the Site, the vehicles of the Contractor and his suppliers shall not exceed a speed of equivalent to 20 km/h.

Aggregate, mud and sand deposited onto public roads by construction activities shall be cleared on a daily basis.

In case of a linear development or if no formal access road is required the Contractor will identify the access point and route, once the first vehicle has travelled this route the established tracks will become the dedicated tracks used for the project and vehicles may not deviate from these.

When using gravel roads the Contractor shall maintain the integrity of the gravel road by drafting an instrument consisting of heavy duty vehicle tyres behind an appropriate service vehicle on a weekly basis. Should any public or private road used by the Contractor deteriorate to the extent that it possesses a hazard to the public, the Contractor is to reinstate it to the original condition. .

6.3.8 Cement and concrete batching

Note to Compiler: Take note of soil type and the potential impact that cement and concrete batching will have on the soil pH. Housekeeping regarding cement and concrete batching is the Engineers responsibility, but impact on soil and water responsibility to be covered in this document

Where applicable, the location of the batching plant (including the location of cement stores, sand and aggregate stockpiles) shall be as approved by the Engineer. The concrete/cement batching plant shall be kept neat and clean at all times.

The batching plant shall be located on a smooth impermeable surface (plastic) and shall be bunded and sloped towards a sump to contain spillages of substances.

All wastewater resulting from batching of concrete shall be disposed of via the contaminated water management system and shall not be discharged into the environment.

Empty cement bags shall be stored in temporary weatherproof containers and shall be disposed of on a regular basis via the solid waste management system.

The Contractor shall take all reasonable measures to prevent the spillage of cement/ concrete during batching and construction operations. During pouring, the soil surface shall be protected using plastic and all visible remains of concrete shall be physically removed on completion of the cement/ concrete pour and appropriately disposed of. All spoiled and excess aggregate/ cement/ concrete shall be removed and disposed of via the solid waste management system.

Where “ready-mix” concrete is used, the Contractor shall ensure that the delivery vehicles do not wash their chutes directly onto the ground. Any spillage resulting from the “ready-mix” delivery shall be immediately cleared and disposed of via the solid waste management system.

6.3.9 Fire control

Note to Compiler: Take note of the National Veld Forests Fire Act (Act No. 101 of 1998) when near a forested area

No fires may be lit on site. Any fires that occur shall be reported to the Engineer immediately. Smoking shall not be permitted in those areas where it is a fire hazard. In terms of the National Environmental Management Air Quality Act (No. 39 of 2004), burning is not permitted as a disposal method.

The Contractor shall ensure that there is basic fire-fighting equipment available on Site at all times. This shall include at least rubber beaters when working in urban open spaces and fynbos areas, and at least one fire extinguisher of the appropriate type when welding or other “hot” activities are undertaken.

6.3.10 Emergency procedures

Note to Compiler: Insert Additional, depending on project

The Contractor shall ensure that his employees are aware of the procedure to be followed for dealing with spills and leaks, which shall include notifying the Engineer and the relevant authorities. The Contractor shall ensure that the necessary materials and equipment for dealing with spills and leaks is available on Site at all times. Treatment and remediation of the spill areas shall be undertaken to the reasonable satisfaction of the Engineer.

In the event of a hydrocarbon spill, the source of the spillage shall be isolated, and the spillage contained. The area shall be cordoned off and secured. The Contractor shall ensure that there is always a supply of absorbent material readily available to absorb/ breakdown and where possible be designed to encapsulate minor hydrocarbon spillage. The quantity of such materials shall be able to handle a minimum of 200 ℓ of hydrocarbon liquid spill.

6.3.11 Community relations

Note to Compiler: make sure CLO is appointed or identified during EIA process to allow for continuity and understanding of the process. Ensure that CLO is independent with no political affiliation

The Contractor shall erect and maintain information boards in the position, quantity, design

and dimensions specified. Such boards shall include contact details for complaints by members of the public in accordance with details provided by the Engineer.

The Contractor shall keep a "Complaints Register" on Site. The Register shall contain all contact details of the person who made the complaint, and information regarding the complaint itself.

The Contractor shall ensure that at all times there is an adequate and safe path for pedestrians passing the site, if needed walkways must be constructed.

Should it be required, the Contractor shall appoint an unaffiliated, qualified and experienced Community Liaison Officer (CLO) to link with neighbouring I&APs.

6.3.12 Protection of natural features

Note to Compiler: Verify that all permits for protection of natural features are in place. Drawings may be issued and linked with 6.3.8 if needed. Update fines if needed

The Contractor shall not deface, paint, damage or mark any natural features (e.g. rock formations) situated in or around the Site for survey or other purposes unless agreed beforehand with the Engineer. Any features affected by the Contractor in contravention of this clause shall be restored/ rehabilitated to the satisfaction of the Engineer.

The Contractor shall not permit his employees to make use of any natural water sources (e.g. springs, streams, and open water bodies) for the purposes of swimming, personal washing and the washing of machinery or clothes.

6.3.13 Protection of flora and fauna

Note to Compiler: Verify that all permits for the protection of flora and fauna are in place. Determine the necessity for MS and or remove from 6.3.1 if needed. Determine link with 6.3.8. Update fines if needed

Except to the extent necessary for the carrying out of the Works, flora shall not be removed, damaged or disturbed nor shall any vegetation be planted without authorisation.

Trapping, poisoning and/or shooting of animals is strictly forbidden. No domestic pets or livestock are permitted on Site.

6.3.14 Protection of archaeological and paleontological remains

Note to Compiler: Verify that all permits for the protection of archaeological and paleontological remains are in place. As previous comment on 6.3.1 and 6.3.8. Update fines if needed

The Contractor shall take reasonable precautions to prevent any person from removing or damaging any fossils, coins, articles of value or antiquity and structures and other remains of archaeological interest discovered on the Site, immediately upon discovery thereof and before removal. The Contractor shall inform the Engineer immediately of such a discovery and carry out the Engineers instructions for dealing therewith. All works within the vicinity of the discovery must cease immediately and the area shall be cordoned off until such time as the Engineer authorises resumption of the works in writing.

If a grave or midden is uncovered on site, or discovered before the commencement of work, then all work in the immediate vicinity of the graves/middens shall be stopped and the engineer informed of the discovery. The South African Heritage Resource Agency and the

South African Police Services (SAPS) should be contacted and in the case of graves, arrangements made for an undertaker to carry out exhumation and reburial. The undertaker will, together with SAHRA, be responsible for attempts to contact family of the deceased and for the place where the exhumed remains can be re-interred.

6.3.15 Stockpiling

Note to Compiler: Windrows are a better way of storing material and should be used rather than stockpiling. Verify that Specification 6.3.5 is also updated in conjunction with this and the volume of material is also to be considered. A rule of thumb is that the stockpile will be approximately twice the width and depth of any excavation. Take into account that topsoil and spoil should be stored separately. Allow for testing and replacement of material. Keep seedbank intact as it limits rehabilitation costs. Refer to Specification EMRA for revegetation or EMR for rehabilitation

The Engineer will identify suitable sites for stockpiling. Stockpiles shall be convex in shape, shall be no higher than 2 m and shall be located so as to cause minimal disturbance. Where required, appropriate precautions shall be taken to prevent the erosion and limit the compaction of the stockpiles. The Contractor shall ensure that all stockpiles do not cause the damming of water or run off, or is itself washed away.

6.3.16 Dust

Note to Compiler: Take note that dust minimization measures are dependent on the availability of water. Take note of the soil conditions and the feasibility of dust minimisation measures for specific projects, in some instances dust is preferable to wasting water. If water is an issue in sandy areas, where dust is not normally an issue, investigate alternative suppression measures including organic mulch or grubbed material to prevent dust. Particle size and wind velocity are the most important factors to consider in dust generation. Wind breaks are only effective for the leeward area equivalent to twice the height of the break

The Contractor shall take all reasonable measures to minimise the generation of dust as a result of construction activities to the satisfaction of the Engineer. Appropriate dust suppression measures, e.g. dampening with water, shall be used when dust generation is unavoidable, particularly during prolonged periods of dry weather in summer. Dust suppression measures shall be agreed upon in consultation with the Engineer.

6.3.17 Site closure and rehabilitation

[Note to Compiler: Add Specification EMR/EMRA if more detailed process is required. Depending on the area and work, rehabilitation should commence in phases and not wait until the end. Special attention to be paid to drought conditions and growth seasons when compiling the section]

Any areas that the Engineer believes may have been impacted upon or disturbed, shall be rehabilitated to the satisfaction of the Engineer, which includes all areas where Topmaterial has been stripped. Once construction is complete the Contractor shall clear everything from the Site not forming part of the Permanent Works. The area to be rehabilitated shall first be landscaped to match the topography of the surrounding area as it was prior to construction. The composition of vegetation to be used for any rehabilitation shall be as specified in the Specification Data.

The Contractor may not use herbicides, pesticides, fertilisers or other poisonous substances for the rehabilitation process unless otherwise agreed with the Engineer.

All rehabilitated areas shall be considered “no go” areas and the Contractor shall ensure that none of his staff or equipment enters these areas.

The Contractor shall undertake to remove all alien vegetation re-establishing on the area and shall implement the necessary temporary or permanent measures to combat soil erosion.

6.3.18 Temporary re-vegetation of the areas disturbed by construction.

[Note to Compiler: Refer to previous comments]

Where there is likely to be a delay of greater than two weeks in the landscaping and revegetation of a disturbed area or where that site is likely to be the subject of further construction activities at a later stage, the Contractor shall ensure that the area is temporarily revegetated to combat dust generation and prevent erosion. This revegetation shall occur incrementally immediately upon completion of the construction activities at the subject location.

Prior to revegetation structures and material not forming part of the Permanent Works, including remnants of building materials, concrete foundations, timber and other foreign debris, shall be removed and disposed of via the solid waste management system. The area shall be revegetated as follows:

- a) The surface shall be levelled by hand or machine as far as practically possible.
- b) Alien vegetation shall be cleared by cutting the plants off at ground level, and painting the stump with 0.5% Garlon in diesel.
- c) For areas with a slope of greater than 1:3, straw shall be utilised as a binding material to stabilise the soil during revegetation and rehabilitation of the site. Straw shall consist of natural, dried fibres of hay or chaff of various lengths between 50 mm and 400 mm, delivered to Site in bales and shall be applied evenly by hand or machine at a rate of 1 bale per 20 m² over the area to be revegetated. It shall then immediately be rotovated into the upper 100 mm layer of soil.
- d) The prepared area shall be hydro- or hand-seeded at a rate of 40 kg/ha using Rye grass (*Lolium multiflorum*). In the event of hand-seeding, the seed mixture as specified shall be mixed with two parts per volume of clean dry plaster sand, then divided in half and applied evenly in two successive applications, one after the other, by means of an approved hand seeding machine (known colloquially as a “tefsaaier”). On completion of the seeding the surface shall be lightly raked to cover the seed with no more than 5 mm of soil.
- e) Water used for the irrigation of vegetated areas shall be free of pollutants that will have a detrimental effect on the plants. The vegetated area shall only be watered once, immediately following seeding. Watering should be carried out from a tanker, using a fine nozzle spray to avoid erosion and disturbance of the vegetation. Water for irrigation purposes may not be drawn from any water body.

No construction equipment, vehicles or unauthorised personnel shall be allowed onto areas that have been vegetated. Only persons or equipment required for the preparation of areas, application of fertiliser and maintenance of revegetated area shall be allowed to operate on these areas.

6.3.19 Temporary site closure

[Note to Compiler: This section especially applies when contract extends over the Christmas break period]

If the site is closed for a period exceeding one week, the Contractor, in consultation with the Engineer shall carry out the following checklist procedure.

Hazardous materials stores

Outlet secure / locked

Bund empty (where applicable)

Fire extinguishers serviced and accessible
Secure area from accidental damage e.g. vehicle collision
Emergency and contact details displayed
Adequate ventilation

Safety

All trenches and manholes secured
Fencing and barriers in place as per the Occupational Health and Safety Act (No 85 of 1193)
Emergency and management contact details displayed
Pipe stockpile wedged/ secured

Erosion

Wind and dust mitigation in place
Slopes and stockpiles at stable angle
Revegetated areas watering schedules and supply secured

Water contamination and pollution

Cement and materials stores secured
Toilets empty and secured
Refuse bins empty and secured
Drip trays empty and secure (where possible)
Structures vulnerable to high winds secure

7. COMPLIANCE WITH REQUIREMENTS AND PENALTIES

7.1 Compliance

Environmental management is concerned not only with the final results of the Contractor's operations to carry out the Works but also with the control of how those operations are carried out. Tolerance with respect to environmental matters applies not only to the finished product but also to the standard of the day-to-day operations required to complete the Works.

It is thus required that the Contractor shall comply with the environmental requirements on an ongoing basis and any failure on his part to do so will entitle the Engineer to certify the imposition of a penalty as detailed below.

7.2 Penalties

Penalties will be issued for certain transgressions. Penalties may be issued per incident at the discretion of the Engineer. Such penalties will be issued in addition to any remedial costs incurred as a result of non-compliance with this Specification. The Engineer will inform the Contractor of the contravention and the amount of the penalty, and shall be entitled to deduct the amount from monies due under the Contract.

Note to Compiler: Penalties should be negotiated in line with total allocated value of project. It is recommended that a lump sum be agreed and penalties deducted from that sum. The Sum will act as surety to appoint a subbie to rehabilitate in case of non-compliance, should contractor comply they may receive full sum. It is important that Project leader only pay amounts on written approval from ECO. Contractor responsibilities terminate on final closure report from ECO.

Fines for the activities detailed below, will be imposed by the Engineer on the Contractor.

- | | |
|--|---------|
| a) Any employees, vehicles, plant, or thing related to the Contractor's operations operating within the designated boundaries of a "no-go" area. | R 5 000 |
| b) Any vehicle driving in excess of designated speed limits. | R 1 000 |
| c) Persistent and un-repaired oil leaks from machinery. | R 3 000 |
| d) Persistent failure to monitor and empty drip trays timeously. | R 1 000 |
| e) The use of inappropriate methods for refuelling. | R 1 000 |
| f) Litter on site associated with construction activities. | R 1 000 |
| g) Deliberate lighting of illegal fires on site. | R 5 000 |
| h) Employees not making use of the site ablution facilities. | R 2 000 |
| i) Failure to implement specified noise controls, particularly during blasting | R 2 000 |
| j) Failure to empty waste bins on a regular basis. | R 1 000 |
| k) Inadequate dust control. | R 5 000 |
| l) A spillage, pollution, or any damage to any water course resulting from negligence on the part of the Contractor. | R10 000 |

For each subsequent similar offence the fine shall be doubled in value to a maximum value of R 100 000

The Engineer will determine what constitutes a transgression in terms of this clause, subject to the provisions of Clause 60(1) of the General Conditions of Contract. In the event that transgressions continue the Contractor's attention is drawn to the provisions of Sub-clause 58(1)(b)(vi) of the General Conditions of Contract under which the Engineer may cancel the Contract..

8. Void

9. Void

10. MEASUREMENT AND PAYMENT

10.1 Basic principles

10.1.1 General

Except as specified below or in the Specification Data or as billed, no separate measurement and payment will be made to cover the costs of complying with the provisions of this Specification and such costs shall be deemed to be covered by the rates tendered for the items in the Bill of Quantities completed by the Contractor when submitting his tender.

10.1.2 All requirements of the environmental management specification

All work not measured elsewhere, associated with complying with any requirement of the environmental management specification shall be measured as a sum. The tendered rate shall cover any cost associated with complying with the environmental management specification and shall include for all materials, labour and plant required to execute and complete the work as specified, described in the Bill of Quantities or shown on the drawing(s).

10.1.3 Work "required by the Specification Data"

Note to Compiler: Verify that

Where a clause in this Specification includes a requirement as "required by the Specification Data", measurement and payment for compliance with that requirement shall be in accordance with the relevant measurement and payment clause of the Specification Data.

10.2 Billed items

10.2.1 Method Statements: Additional work

No separate measurement and payment will be made for the provision of Method Statements but, where the Engineer requires a change on the basis of his opinion that the proposal may result in, or carries a greater than warranted risk of damage to the environment in excess of that warranted by the Specifications, then any additional work required, provided it could not reasonably have been foreseen by an experienced contractor, shall be valued in accordance with the Clause in the General Conditions of Contract dealing with Provisional Sums.

A stated sum is provided in the Bill of Quantities to cover payment for such additional work.

10.2.2 All requirements of the environmental management specification

Unit: Sum

All other work not measured elsewhere, associated with complying with any requirement of the environmental management specification shall be measured as a sum. The tendered rate shall cover any cost associated with complying with the environmental management specification and shall include for all materials, labour and plant required to execute and complete the work as specified, described in the Bill of Quantities or shown on the drawing(s).

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APPENDIX A : APPLICABLE STANDARDS

Reference is made to the latest issues of the following standards:

SANS 1200 A	General
SANS 1200 AA	General (small works)
SANS 1200 C	Site clearance
SANS 1200 D	Earthworks

Specification AO	Occupational Health and Safety
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Construction Regulations, 2015. General conditions of contract for construction workers

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APPENDIX E

ADDITIONAL ENVIRONMENTAL ISSUES

(Note to Compiler: Insert this is Appendix D is not used)

ADDITIONAL ENVIRONMENTAL ISSUES DEEMED TO FORM PART OF THE eMMP

Listed below are environmental issues that, although they form part of the Contract Document, are not explicitly addressed in the environmental specifications. They are listed here, however, to emphasise that they form part of the environmental considerations and requirements for this project.

Unless otherwise stated clause references relate to the General Conditions of Contract for Construction Works (referred to as GCC 2015).

Employer's Agent's authority to delegate

In terms of clause 3.2.4 the Employer's Agent has the authority to appoint a representative to act as the Environmental Control Officer for the Contract. The EO shall be responsible for monitoring compliance with the eMMP, and may be the Employer's Agent's Representative or any other person responsible to the Employer's Agent.

Compliance with the Employer's Agent's Instructions

Clause 4.2.1 requires that the Contractor comply with the Employer's Agent's instructions on any matter relating to the Works. Moreover, clause 4.2.2 ensures that the Contractor only takes instructions from the Employer's Agent, the Employer's Agent's Representative or other person authorised by the Employer's Agent in terms of clause 3.3.4

Access to the Works

Clause 5.4.1 makes provision for the Employer's Agent to authorise access to the Works by the ER/EO.

Copy of Documents on Site

Clause 16(3) requires the Contractor to keep a copy of all documents constituting the Contract (including the environmental specifications) available on Site.

Method Statements and Programme

Clause's 15(2) and 15(3)(b) make provision for the Employer's Agent to request documents concerning the Contractors arrangements and methods of carrying out

the Works. In the case of the environmental specifications, these would be submitted as Method Statements.

Clause 15(2) also makes provision for the Employer's Agent to request the programme for carrying out the Works.

Compliance with other legislation

Clause 4.3.1 requires that the Contractor comply with all applicable laws in the performance of the Contract.

Health and Safety

Clause's 6(5), and 23(2) of GCC 2015 remind the Contractor of his obligations in terms of the Occupational Health and Safety Act, No. 85 of 1993.

Clause 5.7 of SANS 1200A reinforces these requirements through the observation of proper and adequate safety arrangements.

Monitoring

Clause 3.3.2.1 makes provision for the Employer's Agent to undertake such duties and functions as are required in terms of the Contract, including the monitoring of any environmental variables.

Public Nuisance, and Pollution

Clause 8.1.1 requires that all operations necessary for the execution of the Works be carried out so as not to cause unnecessary noise or pollution, or to interfere unnecessarily or improperly with public services, or the access to, use and occupation of public or private roads and footpaths or properties.

Clause 5.6 of SANS 1200A further requires the Contractor to minimise dust nuisance and pollution of streams and inconvenience to or interference with the public.

Dust

Clause 8.1.1 requires that all operations necessary for the execution of the Works be carried out so as not to cause unnecessary air pollution.

Clause 5.6 of SANS 1200A requires that the Contractor take all reasonable measures to minimise any dust nuisance.

Noise

Clause 8.1.1 of GCC 2015 requires that all operations necessary for the execution of the Works be carried out so as not to cause unnecessary noise pollution.

Clause 4.1 of SANS 1200A requires that when working in built-up areas, the Contractor shall provide and use suitable and effective silencing devices for pneumatic tools and other plant that would otherwise cause a noise level exceeding 85dB.

Protection of Archaeological/ Palaeontological remains

Clause 4.7 requires the Contractor to take reasonable precautions to prevent any person from removing or damaging any archaeological or palaeontological artefact, or other articles of value and requires that he inform the Employer's Agent and follow any instructions issued in this regard.

Hours of Operation

Clause 5.8 restricts the Contractors hours of operation to between sunrise and sunset from Monday to Saturday unless otherwise approved by the Employer's Agent.

Clause 5.7.2 further requires that in the event that permission is granted for night working then such work will be carried out without unreasonable noise and disturbance.

Ablution Facilities, First Aid Services and Potable Water

Clause 4.8 requires the Contractor to provide and maintain adequate and suitable sanitary facilities, first aid services and a potable water supply for his Employees on Site.

Clause 4.2 of SANS 1200A further requires that facilities provided comply with local authority regulations and are maintained in a clean and sanitary condition.

Protection of Existing Environment

Under Clause 8.1.1 the Contractor shall not use the Site or land connected with the Works for any purpose whatsoever other than the proper carrying out of the Works, nor shall trees and vegetation be cut down.

In addition Clause 8.2.2 requires that the Contractor uses every reasonable means to prevent damage to roads and bridges communicating with or in the vicinity of the Site.

Removal from Site

Clause 4.11.2 makes provision for the Employer's Agent to instruct the removal of any persons who in his opinion is guilty of misconduct; or is incompetent, negligent, or constitutes an undesirable presence on site.

Clause 7.6 requires that all Plant be in good working order. Accordingly, the Employer's Agent may order that any Plant not complying with the environmental specifications be removed from Site.

Competence

Clause 4.11 requires that all persons Employed on site are careful, competent, and efficient. These attributes embrace knowledge of the environmental matters and issues dealt with in the eMMP.

Reinstatement

Clauses 7.8.1 makes provision for the Contractor to make good any damage, due to negligence on the part of himself or his Employees, to the satisfaction of the Employer's Agent, and bear any costs associated with such reinstatement.

Suspension of Works

Clause 5.11.6 enables the Employer's Agent to suspend the progress of the Works or any part thereof as a result of some default or breach of the Contract on the part of the Contractor.

Site Clean Up

Clause 5.15 requires that as part of the completion of the Works or any portion thereof, the Contractor shall clear away and remove from the Site all Construction Plant, surplus materials, rubbish and Temporary Works of every kind and leave the whole Site and Permanent Works clean and tidy. If the Contractor fails to comply, the eMMP Employer may have the site cleared and recover the cost from the Contractor.

APPENDIX F

METHOD STATEMENT

(Note to Compiler: Insert MS only if it is not Emergency repair and Work Orders does not cover a work methodology.)

METHOD STATEMENT

CONTRACT:

DATE:

PROPOSED ACTIVITY (give title of method statement and reference number from the eMMP):

WHAT WORK IS TO BE UNDERTAKEN (give a brief description of the works):

WHERE ARE THE WORKS TO BE UNDERTAKEN (where possible, provide an annotated plan and a full description of the extent of the works **including coordinates**):

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date:

End Date:

HOW ARE THE WORKS TO BE UNDERTAKEN (provide as much detail as possible, including annotated sketches, maps/ plans where possible, use additional pages if required):

DECLARATIONS

1) CONTRACTOR

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to other signatories and that the ECO and the site agent will audit my compliance with the contents of this Method Statement

(signed)

(print name)

Dated: _____

2) ENVIRONMENTAL CONTROL OFFICER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactorily mitigated to prevent avoidable environmental harm:

(signed)

(print name)

Dated: _____

3) APPROVING AUTHORITY (i.e. ER/ Engineer)

The works described in this Method Statement are approved.

(signed)

(print name)

(designation)

APPENDIX G

AUDIT REPORT

(Note to Compiler: Insert necessary if required for information purposed but my be delete or replace by Daily check list.)

Report no.:

eMMP COMPLIANCE CHECKLIST FOR

[Project title]

eMMP Audit for month of:

Undertaken by:

Accompanied by:

Signed: _____

Areas of non-compliance are highlighted in **YELLOW**

Abbreviations used in doc:

ENG = Engineer

ER = Engineer's Representative

CON = Contractor

ECO = Environmental Control Officer

H&S = Health & Safety Officer

Aim	Action to be audited	✓ or X or N/A	Corrective action required (Y/N)	Comment	For Action
1. MATERIALS					
Materials handling, use and storage (Sec 1.1)					
Management, handling, use and storage of materials	Method Statement received				
	All imported/manufactured materials stored at designated areas approved by Engineer				
	Loads protected from spilling during transit				
	Delivery drivers informed of procedures and restrictions required under the SES, and supervised during off-loading				
Stockpiling (Sec 1.2)					
Ensure the correct storage and handling of both construction material and excavated earth material	Method Statements received and approved				

Aim	Action to be audited	✓ or X or N/A	Corrective action required (Y/N)	Comment	For Action
	Topsoil stored separately from subsoil (i.e. no contamination of topsoil) and protected from wind/water erosion				
	Other earth material stockpiled in area approved by Client's Agent and protected from wind/water erosion				
	Disturbed areas/exposed ground surfaces protected or rehabilitated				
	Stockpiles in correctly allocated areas (not within 100m of residential, "no-go", or watercourses)				
Solid Waste Management (Sec 1.3)					
The proper storage and disposal of solid waste	Solid Waste Method Statement received and applied				
	Sufficient number of bins with lids provided at on site				
	Bins emptied regularly				

Aim	Action to be audited	✓ or X or N/A	Corrective action required (Y/N)	Comment	For Action
	Are all vacant sites/sites to be developed at a later stage kept pristine				
	Waste (i.e. rubble, packaging, empty cement bags) stored in closed containers in a designated area approved by the Client's Agent				
	Waste taken off-site at a regular basis and disposed of at registered landfill site				
	Recyclable waste stored separately and recycled				
	No on site burning or burying of waste				
The proper storage and disposal of solid waste	Cleared vegetation/spoil stored in area approved by Engineer and taken offsite within 45 days of site clearing.				
Water Use (Sec 1.4)					
	Quantity and quality of water used approved				

Aim	Action to be audited	✓ or X or N/A	Corrective action required (Y/N)	Comment	For Action
Hazardous substances (Sec 1.5)					
Pollution prevention and remediation and general health and safety measures	Method Statement received and followed				
	Primary Containers with appropriate markings and in a good condition				
	Stored in an enclosed and bunded area or secondary container				
	Staff aware of emergency procedure in case of spillage				
	Material Safety Data Sheets available on site				
	Proper dispensing equipment used (no tipping of container) with drip trays present				
	Drip trays inspected and emptied daily, and serviced when necessary				
	Dispensing equipment stored in waterproof container				

Aim	Action to be audited	✓ or X or N/A	Corrective action required (Y/N)	Comment	For Action
	Potential hazardous materials (incl. sludge), substances stored handled and disposed of in suitable manner				
	Hazardous materials disposed of hazardous waste site and with slips for proof of disposal				
Contaminated Water (Sec 1.6)					
	Method Statement received and followed				
Prevent the discharge of contaminated water into the environment	Does the Contractor have sufficient measures in place to prevent surface or groundwater pollution (i.e. from spillage of hydrocarbons, runoff from stockpiles/waste areas etc.)?				
	Are such measures functioning properly and correctly and regularly maintained?				

Aim	Action to be audited	✓ or X or N/A	Corrective action required (Y/N)	Comment	For Action
	Engineers approval obtained prior to discharge of contaminated water into Municipal sewer system				
Cement/Concrete batching (Sec 1.7)					
Prevent degradation of the environment through concrete batching and washing activities	Method Statement received and followed				
	Is concrete mixing on site an impermeable surface?				
	Is excess concrete waste removed and disposed of at a registered waste disposal site?				
	Does cement stabilization only occur during low wind periods?				
	Are cement bags stored inside water tight containers and disposed of at a registered waste disposal site?				

Aim	Action to be audited	✓ or X or N/A	Corrective action required (Y/N)	Comment	For Action
	Are equipment cleaned in designated area not within 100m from no-go areas or watercourses?				
	Is run-off water from cleaning of equipment retained on site?				
2. PLANT					
Fuel (Sec. 2.1)					
Pollution prevention and to manage the handling, use and storage of fuel and oil	Method Statement received and followed				
	Fuel storage area located at specified location at least 100m from any major drainage systems, residential areas or “no-go” areas				
	Fuel stored in containers complying with specifications i.e. in tanks with lids or bowers				
	Fuel will be stored in separate tanks not exceeding 9000l				

Aim	Action to be audited	✓ or X or N/A	Corrective action required (Y/N)	Comment	For Action
Pollution prevention and remediation and the correct handling, use and storage of fuel	Containers stored inside bund (volume 110% of capacity of largest storage container)				
	Bund undamaged				
	Fire-fighting equipment at the fuel depot/storage area				
	Are plant refueled at the depot/workshop, or a similar area where pollution prevention methods are in place?				
	Drips trays used when not refueling at depot				
	Supply of absorbent material readily available to absorb/ encapsulate hydrocarbon spillage (able to handle a minimum of 200ℓ of hydrocarbon spill as per CDC SES)				

Aim	Action to be audited	✓ or X or N/A	Corrective action required (Y/N)	Comment	For Action
	Contaminated soil lifted and disposed of at Hazardous Waste Site				
	Proper dispensing equipment used when >200 l drum.				
	Dispensing equipment not leaking				
	Dispensing equipment stored in waterproof container				
Ablution facilities (Sec. 2.2)					
Pollution prevention and provision of adequate ablution facilities	Method Statement received and followed				
	Sufficient number of toilets provided(1:15) within 200m of working area				
	Are toilets secured to the ground				

Aim	Action to be audited	✓ or X or N/A	Corrective action required (Y/N)	Comment	For Action
	Are toilets within 100m of no-go areas, major drainage regions or residential areas and within 200m of the working areas?				
	Toilets emptied regularly and taken to WWTW with proof of disposal				
Eating area (Sec. 2.3)					
To prevent littering	Designated eating areas provided				
	Workers using eating area				
	Bins with lids provided				
	Eating area not within 100m of no go area, major drainage system or adjacent to the site.				
Site structures (Sec. 2.4)					

Aim	Action to be audited	✓ or X or N/A	Corrective action required (Y/N)	Comment	For Action
	Does the site establishment components and equipment used limit visual intrusion on neighbors?				
	Are materials stored in weatherproof and ventilated sheds with raised floors?				
Workshop, equipment maintenance and storage (Sec. 2.6)					
To prevent the discharge of any harmful chemicals into the environment.	Workshop on site?/Maintenance performed in the workshop				
	Workshop complies with specifications (impermeable, bunded).				
	Only urgent maintenance done outside workshop/Engineer approved maintenance work outside the workshop with drip trays present and not within 100m of no-go or drainage system				
	Drip trays used during servicing of equipment				

Aim	Action to be audited	✓ or X or N/A	Corrective action required (Y/N)	Comment	For Action
	On site plant in good working order and serviced regularly				
	Leaking equipment repaired immediately or removed from Site (spill cleaned up)				
	Washing of plant undertaken for urgent maintenance only.				
	Drip trays provided in construction areas for stationary plant				
Noise (Sec. 2.7)					
To prevent general nuisance caused by noise	Appropriate silencers installed on equipment				
	Appropriate directional and intensity settings maintained on all hooters and sirens				

Aim	Action to be audited	✓ or X or N/A	Corrective action required (Y/N)	Comment	For Action
	No amplified music on site				
	Activities generating noise levels in excess of 85 dB confined to 07h00 to 17h00 Monday to Friday				
Dust Control (Sec. 2.8)					
Reasonable measures to minimize the generation of dust	Method Statement received and followed				
	Dust-suppression measures in place				
	Roads maintained and watered down when necessary				

Aim	Action to be audited	✓ or X or N/A	Corrective action required (Y/N)	Comment	For Action
3. CONSTRUCTION					
Method Statements (Sec. 3.1)					
To facilitate consideration of environmental implications of methods of undertaking specified activities	Received at least 7 days before new activity commenced				
	Method Statements approved				
	Method Statements communicated to all personnel and readily available on site				
	Method Statements followed				
Environmental awareness training (Sec. 3.2)					
Education of employees and encouragement of environmental awareness/ good work ethic	Senior staff attended training				
	General workers attended training				
	Refreshed during toolbox talks				
Site division, demarcation and no-go areas (Sec. 3.3-3.5)					

Aim	Action to be audited	✓ or X or N/A	Corrective action required (Y/N)	Comment	For Action
Safety and minimization of impacts and construction footprint	Method Statement received and followed				
	Work/construction area clearly demarcated				
	No go areas marked and workers informed of no go areas (including within 50m of riparian areas)				
	Are all areas zoned Public Open Space III fenced off prior to commencement of construction and treated as no-go areas for duration of construction				
	Are the Contractors activities, employees, materials and equipment restricted to site?				
Access routes/ haul roads (Sec. 3.6)					
Minimization of environmental impacts and disturbance to site as well as	Movement of all vehicles restricted to designated routes				
	Signage and signalmen where required				

Aim	Action to be audited	✓ or X or N/A	Corrective action required (Y/N)	Comment	For Action
nuisance to surrounding residents and landowners	Speed limit not exceeded				
Fire control (Sec. 3.8)					
	No fires on site				
	Smoking not allowed in areas where it is a fire hazard				
	Employees aware of procedures to follow in case of a fire				
	Basic firefighting equipment available on site, specifically near generators/flammable materials.				
Community Relations (Sec. 3.10)					
Dissemination of information for educational purposes and to encourage good	Reasonable measures to ensure site and equipment off-limits to public				
	Information board/s erected.				

Aim	Action to be audited	✓ or X or N/A	Corrective action required (Y/N)	Comment	For Action
community relations	Complaints being noted/ register kept				
Protection of flora and fauna and natural features (Sec. 3.11 & 3.12)					
Protection/ conservation and minimization of impacts on flora and fauna and natural features	Method Statement received and followed				
	Flora not removed, damaged or destroyed unless necessary for carrying out the works				
	No trapping, poisoning or shooting of animals				
	Natural features not damaged/defaced except if absolutely necessary for carrying out the works				
	Streams/other water bodies not used by workers for washing, swimming etc.				
	Are all disturbed sites revegetated and rehabilitated immediately after construction				

Aim	Action to be audited	✓ or X or N/A	Corrective action required (Y/N)	Comment	For Action
Stormwater Management (Sec. 3.13)					
Containment and diversion of stormwater in order to prevent impacts on surface and ground water resources	Method Statement received and followed				
	Measures in place to prevent sand, silt or silt laden water from entering stormwater drains or any other surface water course/body				
	Reasonable measures in place to prevent erosion of excavated material and temporary channels				
Aesthetics (Sec. 3.15)					
Site neatness	Construction camp and working area is kept neat and tidy				
General					
To encourage environmentally sound practice	Monthly Compliance Certificate has been completed				
	Any fines recorded in the Site Diary				

Aim	Action to be audited	✓ or X or N/A	Corrective action required (Y/N)	Comment	For Action
	Telephone numbers of emergency services are available on Site.				

General Comments

-

(Note to Compiler: Insert on small projects only)

ENVIRONMENTAL OFFICER: DAILY CHECKLIST

Contract:

ENVIRONMENTAL ASPECT	YES/ NO (✓ or X)	COMMENTS
• All new personnel on site are aware of the contents of the eMMP and have been through the environmental awareness course.		
• Contractor's camp is neat and tidy and the labourers facilities are of an acceptable standard.		
• Sufficient and appropriate fire fighting equipment is visible and readily available in the appropriate places, e.g. next to the fuel depot or where "hot work" is underway.		
• Waste control and removal system is being maintained.		
• Boundary and other fences are being maintained.		
• Drip trays are being utilised where there is a risk of incidental spillage		
• Bunds/ drip trays are being emptied on a regular basis (especially after rain).		
• No leakages are visible from construction vehicles		
• Refuelling of vehicles occurs within the workshop or, if outside the workshop, drip trays are being used.		
• No go areas, remaining natural features and trees have not been damaged.		
• Dust control measures (if necessary) are in place and are effectively controlling dust.		
• Noise Control measures (if necessary) are in place and are working effectively.		
• Erosion control measures (if necessary) are in place and are effective in controlling erosion.		
• Stockpiles of topsoil are located within the boundary of the site, do not exceed 2 m in height and are protected from erosion.		
• Spoil stockpiles are located within the boundary of the site, do not exceed 2 m in height and are protected from erosion.		

Completed by:..... Sign:..... Date:.....

APPENDIX H

NON-CONFORMANCE DOCUMENTS

(Note to Compiler: Always Insert)

Select date

Name

Position

Company

Address

Dear Name

Click here to enter subject

Enclosed please find the Environmental Management Plan Audit Report No Click here to enter text. for the above contract.

This letter serves as a final warning to the Contractor that should any non-conformity not be rectified within two weeks from the date of this letter, the Project manager/Client's Agent will impose penalties in accordance with SPEC EMB and SDEM of the Contract Document by deducting the value of the penalty from the Contractor's next payment application.

These continued transgressions as detailed in the audit report include for the following:

1. Click here to enter text.
2. Click here to enter text.
3. Click here to enter text.

We urge you to work in accordance with the environmental specifications.

Yours faithfully

Firstname Lastname

Position

Enc:

Copies: Mr C Jonker (LSRWUA)
Mr A Struwig (DEDEAT)
Click here to enter text.



Lower Sundays River
Water User Association
Laer Sondagsrivier
Watergebruikersvereniging

FILE REF:

DATE

02/04/2025

CONTRACTOR'S DETAILS:

CONTRACT No:

COPY TO:

ENVIRONMENTAL NON-CONFORMANCE NOTICE

Incident severity:

High/Medium/Low

Number of previous similar non-conformances on same contract:

0

Details of Previous infringements: _____

SECTION 1: DESCRIPTION OF INCIDENT

SECTION 2: DRAWING/SKETCH/PHOTOS

 Lower Sundays River Water User Association Laer Sondagsrivier Watergebruikersvereniging	FILE REF:		DATE 02/04/2025
	CONTRACTOR'S DETAILS:		
	CONTRACT No:		
	COPY TO:		

SECTION 3: RELEVANT DOCUMENTATION

--

SECTION 4: REMEDIAL ACTION REQUIRED

Remedial Action Due Date:

SECTION 5: REMEDIAL ACTION - UNDERTAKING (Contractor to sign acknowledging that remedial action is required and return original to EO/CA for filing)

Contractor:		Environmental Officer:	
Name:		Name:	
Date:		Date:	

SECTION 6: REMEDIAL ACTION - CLOSED OUT (Contractor to sign when remedial action has been completed and return original to EO/CA for filing)

Contractor:		Environmental Officer:	
Name:		Name:	
Date:		Date:	

APPENDIX I

Environmentally friendly products

ENVIRONMENTALLY FRIENDLY PRODUCTS

(Note to Compiler: Expand as required)

It should be noted that this list is by no means exclusive, and that other bio-remediation measures and environmentally friendly products should also be investigated.

BIO-PRODUCTS

ZORBIT TECHNOLOGIES CAPE cc

Tel: (021) 535 5165 or 54 6363/4/5/6 Fax: (021) 54 6367

Products:

- PEAT SORB, microbial bioremediation product for spills on soil and shale

DYNACHEM (PTY) LTD

Chemical Speciality and Detergent Manufacturers

Janine

Tel: (041) 484 2231 www.spillsorb.com

Products:

- SPILL SORB

DRIZIT ENVIRONMENTAL (PTY) LTD

Head Office

Tel: (031) 274 2300 Fax: (031) 206 1189 Email: suraya@drizit.co.za

Products:

- Pollution Control Products
-

SANITARY PRODUCTS

SANNI TREE WATERLESS.CO.1996

Tel. (021) 701 1266

Fax: (021) 701 1272

Email: info@sannitree.co.za

TOP LOO

Tel: (043) 726 4964

Fax: (043) 726 6691

REHABILITATION PRODUCTS

MYCOROOT

Stimulates root growth

Tel: 046 622 5524

Cell: 083 626 0706

Email: j.dames@ru.ac.za

HYSON CELLS

Sally Hall

Tel: 011 957 2478

Cell: 083 565 7111

Email: info@hysoncells.co.za

www.hysoncells.co.za

**To report an environmental crime, call the Environmental
Management Inspectorate (Green Scorpions) at 0800 205 005**

Email pi@toanon.co.za

APPENDIX J

Environmental Work Plan Schedule

(Note to Compiler: Table to be completed by ECO and submitted to DEDEAT to inform of major work commencing)

Staff Member:	Contract No.	Project Manager:
Contractors Representative:	Signature:	Date:
Work Site Activity:	Worksite Location:	

Activity	Task	Environmental Impact	Likelihood	Risk	Control Measures	Responsibility



Addo Canal System Emergency Preparedness Plan

AREA : LOWER SUNDAYS RIVER GOVERNMENT WATER SCHEME

LOWER SUNDAYS RIVER WATER USER ASSOCIATION

REVISED : JUNE 2025



Addo Canal System Emergency Preparedness Plan

CONTENTS

- 1. Introduction**
- 2. Objectives**
- 3. Risk Assessment**
- 4. Emergency Response Team (ERT)**
- 5. Communication Plan**
- 6. Emergency Procedures**
- 7. Training & Drills**
- 8. Resource Inventory**
- 9. Recovery and Post Incident Reviews**
- 10. Appendices**



1. Introduction

The purpose of this Emergency Preparedness Plan is to ensure the safety of the Addo Canal System, surrounding communities, and environmental resources in the event of an emergency such as flooding, structural failure, contamination, or natural disasters.

2. Objectives

- Protect human life and public safety.
- Minimize damage to canal infrastructure.
- Maintain continuity of canal operations.
- Safeguard ecological and economic resources.
- Establish coordination with emergency response agencies.

3. Risk Assessment

- **1. Objective**
- To identify and assess potential risks associated with emergency scenarios involving the Addo Canal, enabling informed planning, response, and mitigation strategies.

Identified Hazards: Identified Hazards:

- **Flooding:** Due to heavy rainfall or upstream dam release.
- **Structural Failure:** Including gate malfunctions, canal bank breaches, or erosion.
- **Contamination:** From chemical spills, agricultural runoff, industrial waste or sewerage.
- **Natural Disasters:** Earthquakes, wildfires, or severe storms.

• Addo Canal Emergency Plan – Risk Assessment
• Location: Addo Canal, [Kirkwood to Barclay Bridge] Date: 12 June 2025 Prepared by: M.W Primmer (LSRWUA)



2. Key Risk Scenarios

Risk Scenario	Likelihood	Impact	Risk Rating	Mitigation Measures
Heavy rainfall leading to overflow	High	Major	High	Weather monitoring; floodgates and overflow channels; early warning system
Water contamination (chemical/biological)	Medium	Major	Medium-High	Water quality monitoring; public alerts; upstream pollution control
Drought / reduced water flow	Medium	Moderate	Medium	Water rationing plans; alternative sources; storage solutions
Illegal dumping or sabotage	Low	Major	Medium	Surveillance; community reporting mechanisms; law enforcement coordination
Blockage or sediment buildup	High	Moderate	High	Regular dredging and maintenance schedules
Downstream flooding to communities	Medium	Severe	High	Flood risk maps; evacuation routes; sandbag stations
Failure of communication infrastructure	Medium	High	High	Backup systems (radio, SMS alerts); drills and education
Wildlife disruption or displacement	Medium	Moderate	Medium	Environmental monitoring; wildlife corridor design
Power failure affecting canal controls	Medium	Major	High	Backup generators; manual operation training



4. Emergency Response Team (ERT)

Role	Name/Title	Contact Number
ERT Coordinator	Christo Jonker	078 568 2168
Safety Officer	Christo Jonker	078 568 2168
Communications Lead	Michael Primmer	084 8444 552
Maintenance Lead	Henschell Forbes	071 382 6947
Liaison to Authorities	Michael Primmer	084 8444 552

5. Communication Plan

- Internal: Radios, SMS alerts, email, and direct phone lines.
- External: Local emergency services (fire, police, EMS), water authority, environmental agencies.
- Public Notification: Sirens, public address systems, local news channels, social media.

6. Emergency Procedures

A. Flood Response

- Monitor water levels continuously.
- Close floodgates as needed.
- Alert downstream communities.
- Evacuate personnel from vulnerable areas.

B. Structural Failure

- Isolate affected section.
- Initiate temporary repairs.
- Notify engineers and emergency services.
- Begin damage assessment and recovery planning.

C. Contamination

- Shut canal intake/outflow valves.
- Notify environmental agencies immediately.
- Conduct water quality testing.
- Implement containment and cleanup measures.

D. Natural Disasters

- Secure facilities and evacuate non-essential personnel.
- Coordinate with regional disaster management authorities.
- Deploy emergency supplies (sandbags, generators, etc.).



7. Training and Drills

- Conduct annual emergency drills.
- Train staff in first aid, equipment operation, and emergency protocols.
- Review and update the plan annually or after any incident.

8. Resource Inventory

- Emergency pumps and backup generators
- Communication equipment
- Spill containment kits
- First aid supplies
- Mobile lighting and power sources
- Plant and machinery

9. Recovery and Post-Incident Review

- Assess damage and prioritize repairs.
- Restore normal operations in phases.
- Document incident details and response effectiveness.
- Update the plan based on lessons learned.

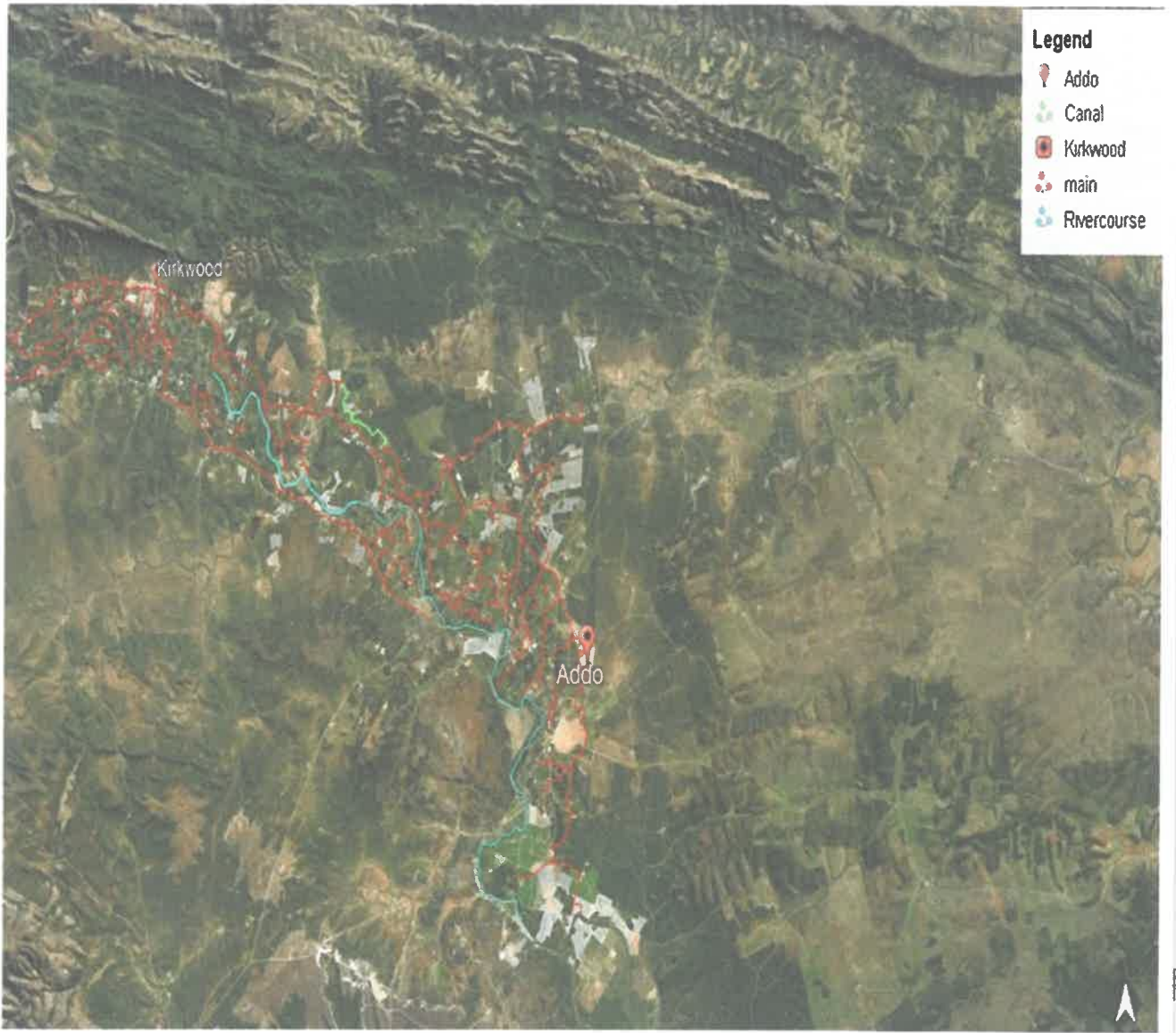
10. Appendices

- Emergency contact list
- Canal map with key infrastructure



Role	Name/Title	Contact Number
ERT Coordinator	Christo Jonker	078 568 2168
Safety Officer	Christo Jonker	078 568 2168
Communications Lead	Michael Primmer	084 8444 552
Maintenance Lead	Henschell Forbes	071 382 6947
Liaison to Authorities	Michael Primmer	084 8444 552

Role	Name/Title	Contact Number
DWS Operations :Deputy Director	Koos Viljoen	078 568 2168
DWS	Glenn Daniell	082 809 5904
Citrus Growers Forum	Gregg Jones	084 8444 552
SA Police Service		042 230 7618
NSRI		041 585 6011
Eastern Cape Provincial Disaster Management Center	Head of Center	082 774 6596
Sundays River Valley Municipality :		
Sundays River Valley Local Disaster Office	Disaster Officer	0800 222 2238 084 733 7373 042 2351 168
Sarah Baardman District Disaster Management Center	Head of Center Disaster Manager	041 508 7125 041 508 7036 041 508 7048
Traffic Services		042 230 7753/52



INCIDENT REPORT TEMPLATE

Section	Field	Details
1. General Information	Report ID	
	Date	
	Location	
	Reported By	
2. Incident Description	Description of Failure	
	Date/Time of Incident	
	Visual Observations	
3. Environmental Conditions	Weather Conditions	
	Water Flow Rate	
	Soil Condition	
	Other Factors	
4. Damage Assessment	Extent of Damage	
	Structures Affected	
	Photos Attached (Yes/No)	
5. Immediate Actions Taken	Actions Taken	
	Date/Time of Action	
6. Recommendations	Recommended Measures	
	Urgency Level	
7. Prepared By	Name	
	Title	
	Signature	
Photographic Evidence		



Laer Sondagsrivier
Watergebruikersvereniging
Lower Sundaysriver
Water User Association



Ceasars Dam Emergency Preparedness Plan

AREA : LOWER SUNDAYS RIVER GOVERNMENT WATER SCHEME

LOWER SUNDAYS RIVER WATER USER ASSOCIATION

REVISED : JUNE 2025

Addo Canal System Emergency Preparedness Plan

CONTENTS

- 1. Introduction**
- 2. Revisions**
- 3. Location and Access Route**
- 4. Emergency Response Team (ERT) & Risk Assessment**
- 5. Communication Plan**
- 6. Emergency Procedures**
- 7. Training & Drills**
- 8. Resource Inventory**
- 9. Recovery and Post Incident Reviews**
- 10. Appendices**
 - Appendix A – Emergency Contact Nos**
 - Appendix B- Access route map**

LOWER SUNDAYS RIVER WATER USER ASSOCIATION

CEASERS DAM

EMERGENCY PREPAREDNESS PLAN (EPP)

This document has been compiled in accordance with the requirements of the Dam Safety Regulations as promulgated in Government Notice R.139 of 24 February 2012 read in conjunction with Chapter 12 Section 123 (Regulations regarding dam safety) of the National Water Act (Act 36 of 1998) and states the official policy towards the emergency preparedness plan of Ceasers Dam.



EMERGENCY PREPAREDNESS PLAN FOR CEASER DAM

REVISIONS OR CHANGES TO THE MANUAL

The manual should be regularly updated. Revisions should be done in accordance with any changes of information and/or events at the dam and the revision information should be clearly recorded and noted.

It is the sole responsibility of the owner (LSRWUA) to keep the manual up to date and to ensure that any changes made to the manual are authorised by the owner himself/herself.

Checked by:

X

Approved by:

X



Laer Sondagsrivier
Watergebruikersvereniging
Lower Sundaysriver
Water User Association

EMERGENCY PREPAREDNESS PLAN

Ceasers Dam

LOCATION AND ACCESS ROUTE TO CEASER DAM

Ceaser dam is located Nomathamsanqa location within Sundays River Valley Municipality of the Sarah Baartman District in the Eastern Cape. To reach the dam wall: From Kirkwood travel on the R336 South-East for approximately 29km. Turn left on the R335 towards Addo Elephant Park. Follow the road for approximately 395m than turn right. Follow the road going over the railway crossing straight towards Nomathamsanqa Location approximately 2km. The dam is located at the right side.

GLOBAL POSITIONING SYSTEM (GPS) COORDINATES

Google earth access: S 33°32'10.20"; E 25°42'47.02"

EMERGENCY PREPAREDNESS

At any time should a condition which can affect the safety of the dam arise, the Area Manager is to be informed immediately.

These conditions are:

- If any unusual displacement is noticed on any part of the structure or foundation
- If any visible cracks which exist or develop during operation change or increase in width/opening of more than 1,0mm per week.
- If any wet patches appear on the downstream slope or foundation which could indicate abnormal leakage through the structure or foundations and which is not being intercepted by the drainage system.
- If the dam is in danger of being overtopped during a flood/storm
- If an earthquake or tremor occurs in the vicinity

4. Emergency Response Team (ERT)

Role	Name/Title	Contact Number
ERT Coordinator	Christo Jonker	078 568 2168
Safety Officer	Christo Jonker	078 568 2168
Communications Lead	Michael Primmer	084 8444 552
Maintenance Lead	Henschell Forbes	071 382 6947
Liaison to Authorities	Michael Primmer	084 8444 552

The **Area Manager /Responsible Supervisory Authority** must, without delay, investigate the reported occurrence and based on sound engineering judgement decide upon further action required. Such action may entail obtaining urgent professional advice and alerting the applicable Disaster Management Agency of the possible dam failure.

• Addo Canal Emergency Plan – Risk Assessment

- Location:** Addo Canal, [Kirkwood to Barclay Bridge]
Date: 12 June 2025
Prepared by: M.W Primmer (LSRWUA)

2. Key Risk Scenarios

Risk Scenario	Likelihood	Impact	Risk Rating	Mitigation Measures
---------------	------------	--------	-------------	---------------------

Heavy rainfall leading to overflow	High	Major	High	Weather monitoring; overflow channels; early warning system
Water contamination (chemical/biological)	Medium	Major	Medium-High	Water quality monitoring; public alerts; upstream pollution control

Risk Scenario	Likelihood	Impact	Risk Rating	Mitigation Measures
Drought / reduced water flow	Medium	Moderate	Medium	Water rationing plans; alternative sources; storage solutions
Illegal dumping or sabotage	Low	Major	Medium	Surveillance; community reporting mechanisms; law enforcement coordination
Blockage or sediment buildup	High	Moderate	High	Regular dredging and maintenance schedules
Downstream flooding to communities	Medium	Severe	High	Flood risk maps; evacuation routes; sandbag stations
Failure of communication infrastructure	Medium	High	High	Backup systems (radio, SMS alerts); drills and education
Wildlife disruption or displacement	Medium	Moderate	Medium	Environmental monitoring; wildlife corridor design
Power failure affecting canal controls	Low	Low	Low	Backup generators; manual operation training

5. Communication Plan

- Internal: Radios, SMS alerts, email, and direct phone lines.
- External: Local emergency services (fire, police, EMS), water authority, environmental agencies.
- Public Notification: Sirens, public address systems, local news channels, social media.

6. Emergency Procedures

A. Flood Response

- Monitor water levels continuously.
- Close sluices and rejects as needed.
- Alert downstream communities.
- Evacuate personnel from vulnerable areas.

B. Structural Failure

- Isolate affected section.
- Initiate temporary repairs.
- Notify engineers and emergency services.

- Begin damage assessment and recovery planning.

C. Contamination

- Shut canal intake/outflow valves.
- Notify environmental agencies immediately.
- Conduct water quality testing.
- Implement containment and cleanup measures.

D. Natural Disasters

- Secure facilities and evacuate non-essential personnel.
- Coordinate with regional disaster management authorities.
- Deploy emergency supplies (sandbags, generators, etc.).

7. Training and Drills

- Conduct annual emergency drills.
- Train staff in first aid, equipment operation, and emergency protocols.
- Review and update the plan annually or after any incident.

8. Resource Inventory

- Emergency pumps and backup generators
- Communication equipment
- Spill containment kits
- First aid supplies
- Mobile lighting and power sources
- Plant and machinery

9. Recovery and Post-Incident Review

- Assess damage and prioritize repairs.
- Restore normal operations in phases.
- Document incident details and response effectiveness.
- Update the plan based on lessons learned.

10. Appendices

- Emergency contact list
- Canal map with key infrastructure

APPENDIX A

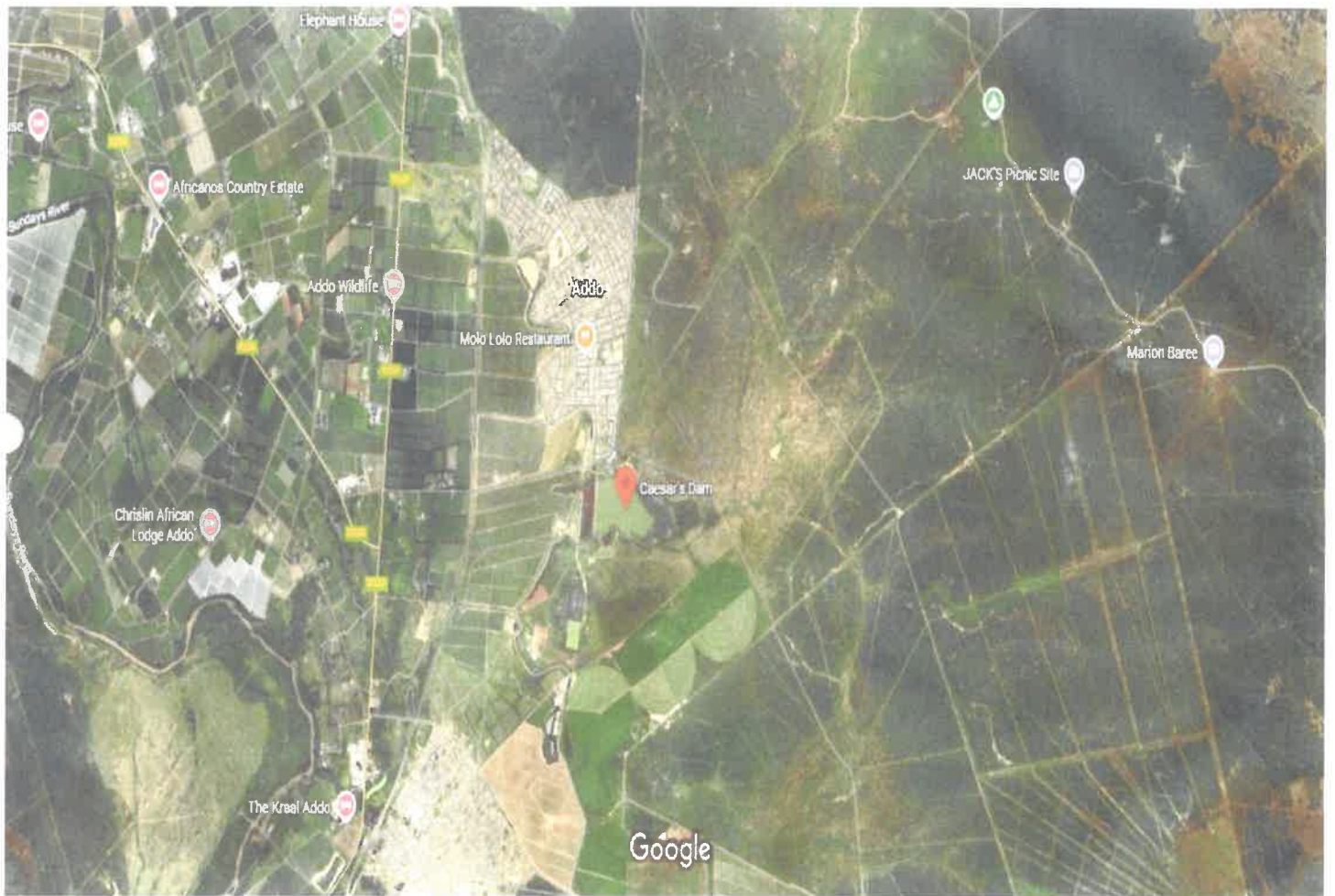
RESPONSIBLE PERSONS / AUTHORITIES TO BE CONTACTED DURING THE EVENT OF AN EMERGENCY

Role	Name/Title	Contact Number
ERT Coordinator	Christo Jonker	078 568 2168
Safety Officer	Christo Jonker	078 568 2168
Communications Lead	Michael Primmer	084 8444 552
Maintenance Lead	Henschell Forbes	071 382 6947
Liaison to Authorities	Michael Primmer	084 8444 552

Role	Name/Title	Contact Number
DWS Operations :Deputy Director	Koos Viljoen	078 568 2168
DWS	Glenn Daniell	082 809 5904
Citrus Growers Forum	Gregg Jones	084 8444 552
SA Police Service		042 230 7618
NSRI		041 585 6011
Eastern Cape Provincial Disaster Management Center	Head of Center	082 774 6596
Sundays River Valley Municipality :		
Sundays River Valley Local Disaster Office	Disaster Officer	0800 222 2238 084 733 7373 042 2351 168
Sarah Baardman District Disaster Management Center	Head of Center Disaster Manager	041 508 7125 041 508 7036 041 508 7048
Traffic Services		042 230 7753/52

APPENDIX B

MAP INDICATING ACCES ROUTES





water & sanitation

Department
Water and Sanitation
REPUBLIC OF SOUTH AFRICA



EMERGENCY PREPAREDNESS PLAN

DAM	SCHEEPERSVLAKTE
DAM NUMBER	N400/10
DATE	OCTOBER 2016
PROJECT NUMBER	0485WTE

DEPARTMENT OF WATER AND SANITATION

SCHEEPERSVLAKTE DAM

EMERGENCY PREPAREDNESS PLAN (EPP)

This document has been compiled in accordance with the requirements of the Dam Safety Regulations as promulgated in Government Notice R.139 of 24 February 2012 read in conjunction with Chapter 12 Section 123 (Regulations regarding dam safety) of the National Water Act (Act 36 of 1998) and states the official policy towards the emergency preparedness plan of Scheepersvlakte Dam.

Approved and Accepted for DWS:

Phahlabetsa

CE: Dam Safety Surveillance



water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

EMERGENCY PREPAREDNESS PLAN FOR SCHEEPERSVLAKTE DAM

REVISIONS OF/OR CHANGES TO THE MANUAL

The manual should be regularly updated. Revisions should be done in accordance with any changes of information and/or events at the dam, and the revision information should be clearly recorded and noted.

It is the sole responsibility of the owner (DWS) to keep the manual up to date and to ensure that any changes to be made to the manual are authorized by the owner himself/herself.

Checked by:



P Jooste Pr Eng: Project Manager

Approved by:



PJ Gouws Pr Eng: Dam Specialist



33 Van Heerden Road
Willows, Bloemfontein, 9301
Tel: 051 522 4800
Fax: 051 522 4865

EMERGENCY PREPAREDNESS PLAN

Scheepersvlakte Dam

LOCATION AND ACCESS ROUTE TO SCHEEPERSVLAKTE DAM

Balura Dam is located on the Coerney River, a tributary to the Sondags River, approximately 15km south-east of the town of Kirkwood, within the Cacadu District Municipality in the Eastern Cape Province. To reach the dam wall: From Kirkwood travel on the R336 South-East for approximately 22.4km. Turn left just after the railway crossing on to the R336 towards Tregaron. Follow the road for approximately 2.5km. Turn right just after crossing the canal on to a dirt road. Follow the dirt road for approximately 2km keeping left at the forks. Turn left and follow the dirt road for 1.5km to the dam wall on left hand side. DWS personnel are stationed at the dam. Refer to **Appendix B** for map of area.

GLOBAL POSITIONING SYSTEM (GPS) COORDINATES

Helicopter access: S 33°27'18" E 25°37'26" or S 33.45500° E 25.62389°

EMERGENCY PREPAREDNESS

At any time should a condition which can affect the safety of the dam arise, the **Area Manager Eastern Cape** is to be informed immediately.

Organisation	Tel	Cell
Department of Water and Sanitation Southern Operations - Area Manager Eastern Cape	048 881 3005	082 805 2917

These conditions are:

- If any unusual displacements are noticed on any part of the structure or foundation

- If any visible cracks which exist or develop during operation change or increase in width/opening of more than 1.0mm per week
- If any wet patches appear on the downstream slope or foundation which could indicate abnormal leakage through the structure or foundations and which is not being intercepted by the drainage system
- If the dam is in danger of being overtopped during a flood/storm
- If an earthquake or tremor occurs in the vicinity

The **Area Manager Eastern Cape / Responsible Supervisory Authority** must, without delay, investigate the reported occurrence and based on sound engineering judgement decide upon further action required. Such action may entail obtaining urgent professional advice and/or alerting the applicable Disaster Management Agency of a possible dam failure.

APPENDIX A

RESPONSIBLE PERSONS / AUTHORITIES TO BE CONTACTED DURING THE EVENT OF AN EMERGENCY

DEPARTMENT OF WATER AND SANITATION

Department of Water and Sanitation Southern Operations - Area Manager Eastern Cape	048 881 3005 082 805 2917
---	------------------------------

DISASTER MANAGEMENT AGENCY

Sundays River Valley Local Disaster Management Centre Disaster Officer	084 733 7373 042 2351 168 081 5377 373
Sarah Baardman District Disaster Management Centre Head of Centre / Disaster Manager	041 508 7125 041 508 7036 041 508 7048
Eastern Cape Provincial Disaster Management Centre Head of Centre	082 774 6596

APPENDIX B

MAP INDICATING ACCESS ROUTES

APPENDIX C

***DAMBREAK ANALYSIS RESULTS WITH TOPOGRAPHICAL MAPS INDICATING
POSSIBLE INUNDATION AREAS DURING A SUNNY-DAY DAM FAILURE***

DAMBREAK FLOOD ANALYSIS

Based on current accepted engineering practices the dambreak flood lines have been determined for the Sunny-day dam failure event. The resulting flood wave determined for such a failure event has been routed downstream of the dam over a distance of 1km for every 1m of wall height (In this case approximately **19 km** downstream). The flood lines and subsequent inundated areas downstream of the dam have been indicated on the attached Google maps.

Based on a breach forming time of **14 minutes** the peak flood at the dam is estimated to be **1090 m³/s**.

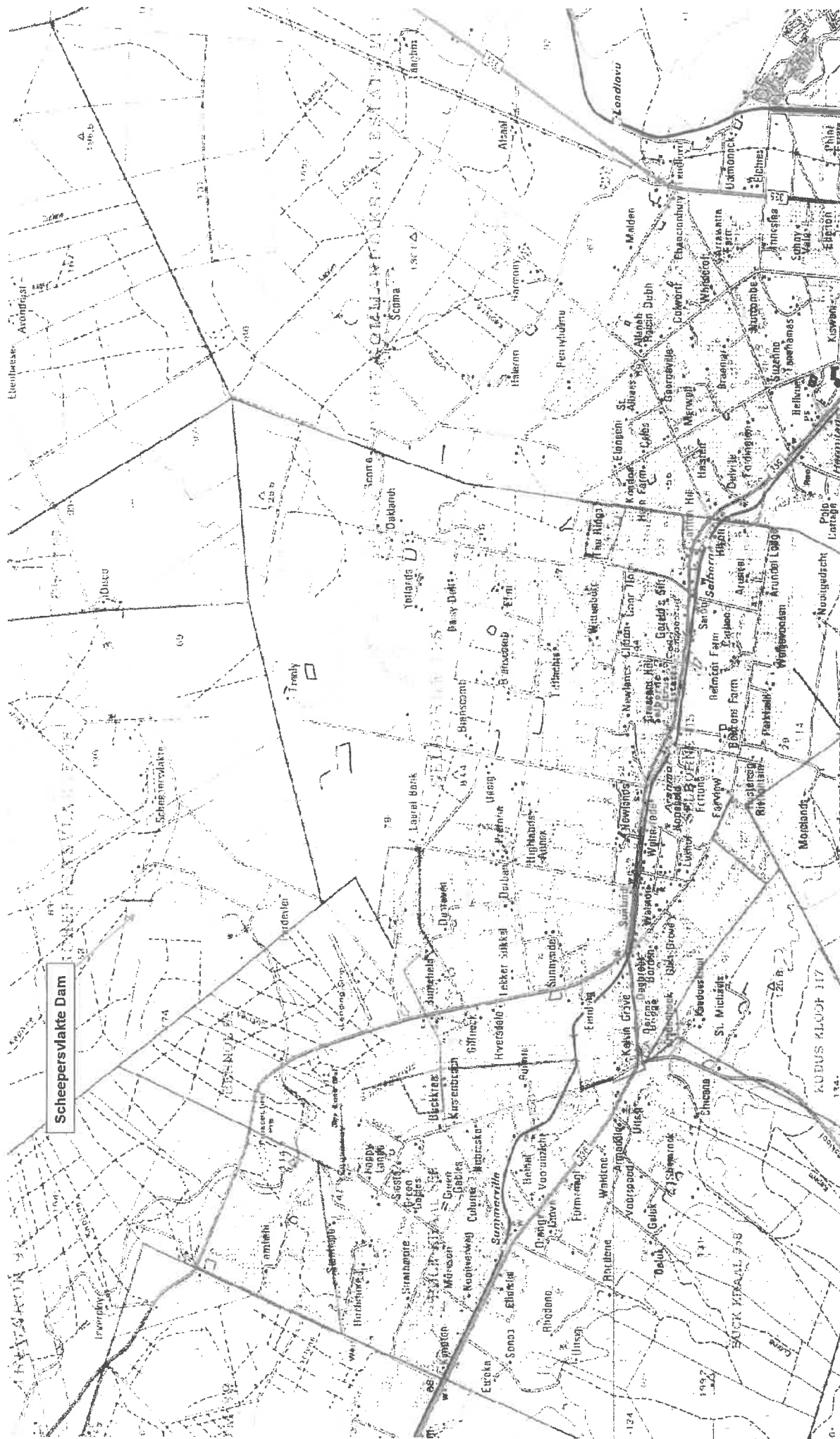
The table below gives a summary of the hydraulic results at each of the major cross sections analysed for the Sunny-day dam failure event.

Section	SUNNY-DAY DAMBREAK		Distance d/s (km)
	Water Surface Elevation (m)	Time to Peak (h)	
1	91.78	0.000	At Dam
2	80.38	0.038	0.45
3	75.99	0.082	0.99
4	73.38	0.138	1.49
5	70.62	0.171	1.88
6	65.68	0.271	2.63
7	62.81	0.350	3.18
8	62.80	0.456	3.68
9	62.71	0.572	4.28
10	62.50	0.659	4.63
11	56.96	0.854	5.75
12	56.66	0.924	6.02
13	54.15	0.974	6.68
14	53.15	1.048	7.12
15	51.93	1.166	7.78
16	51.74	1.285	8.17
17	45.52	1.118	9.05
18	46.36	1.227	9.55
19	44.52	1.291	10.25
20	42.25	1.398	10.76

Section	SUNNY-DAY DAMBREAK		Distance d/s (km)
	Water Surface Elevation (m)	Time to Peak (h)	
21	41.72	1.483	11.19
22	40.25	1.573	11.75
23	37.60	1.723	12.80
24	35.69	1.774	13.16
25	34.45	1.919	14.19
26	34.36	2.020	14.60
27	33.95	2.141	15.30
28	33.15	2.209	15.75
29	32.20	2.326	16.34
30	30.59	2.351	16.72
31	30.43	2.506	17.42
32	30.13	2.591	17.91
33	29.20	2.637	18.41
34	28.29	2.718	18.89
35	26.65	2.772	19.35
36	24.68	2.830	19.87
37	23.19	2.876	20.35

Analysis was based on: USBR (1988), Von Thun and Gilette (1990), Froehlich (1995), MacDonald and Langridge-Monopolis (1984), Kirkpatrick (1977), SCS (1981), Hagen (1982), Reclamation (1982), Singh and Snorrason (1984), Costa (1985), Evans (1986).





Schepersvlakte Dam

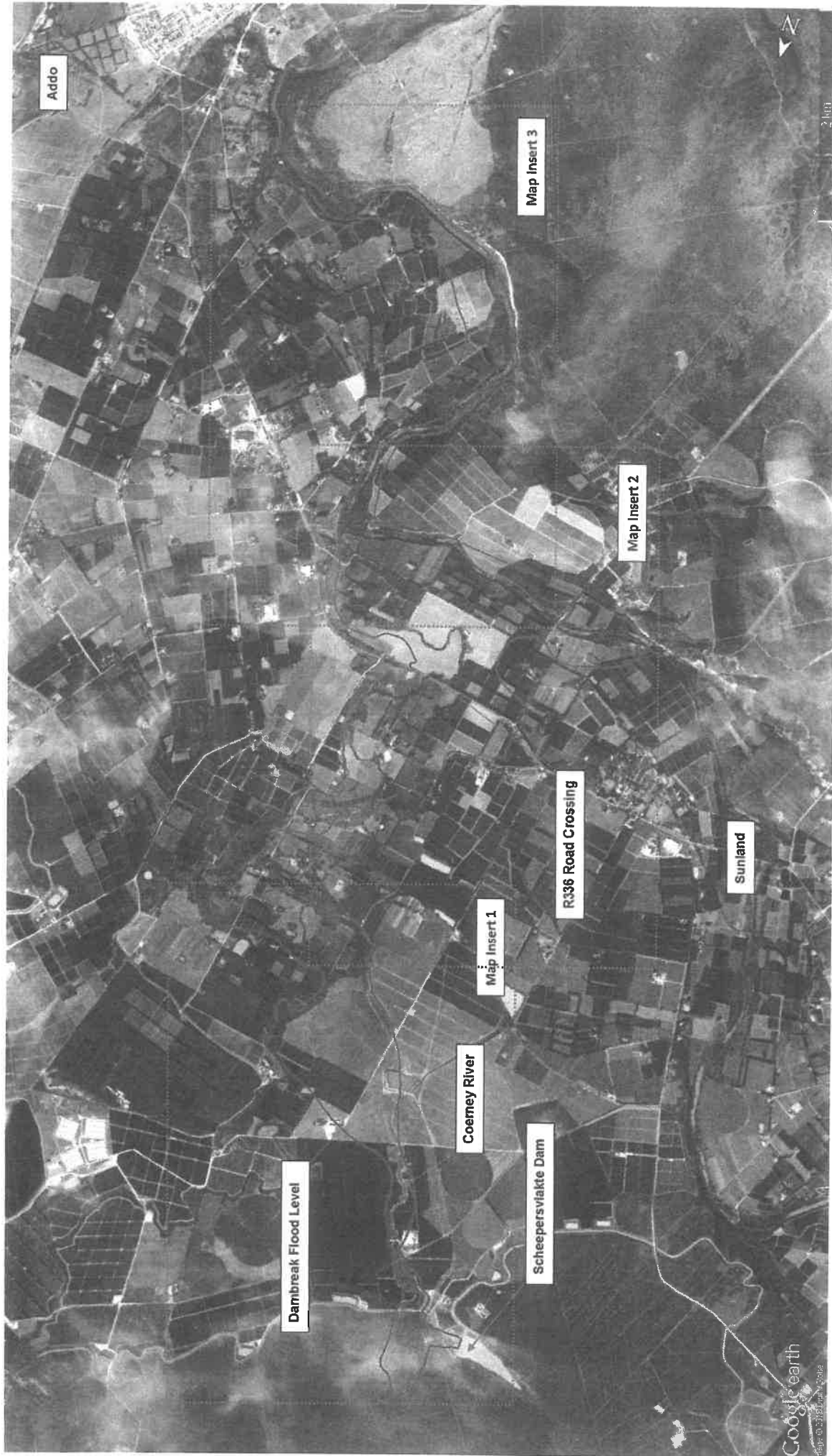
Exact: - Kirkwood L.
SPAR Kirkwood
= Wilcoffers
Kirkwood

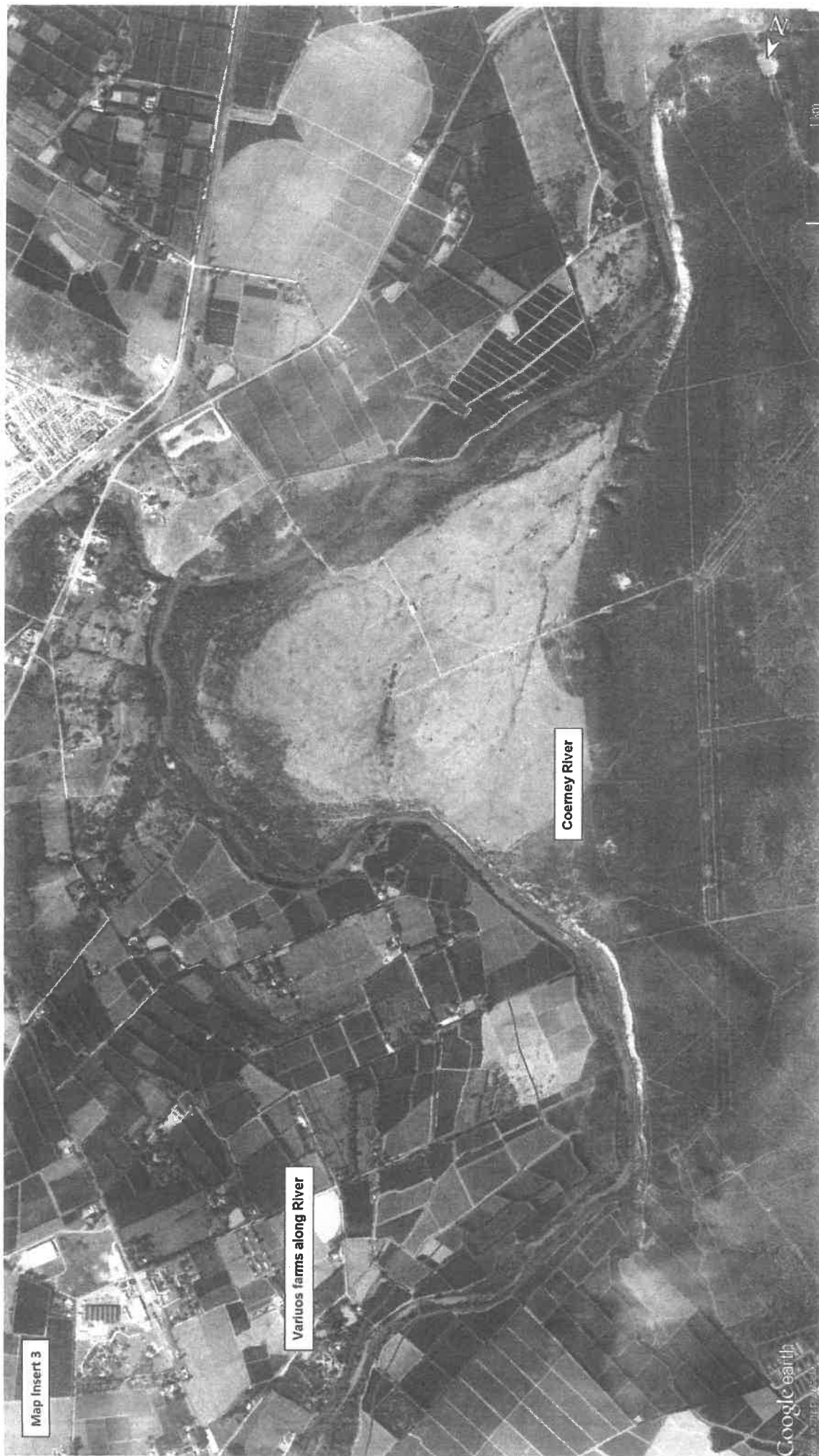
SPAR
Kirkwood

Omudandgeed
Dams / am

Scheepersvlakte Dam

Avoca River Cabins





Map Insert 3

Various farms along River

Coerney River

Google earth

APPENDIX K

Site Staff Undertaking

Environmental Agreement

WRITTEN AGREEMENT BETWEEN

The Lower Sundays River Water User Association (LSRWUA)

and

.....
Staff Member

To comply with NEMA 2014 EIA Regulations

I,

.....
(Insert first name and surname) (Insert Staff Number)

do hereby acknowledge that I agree to ensure that all work will be performed, machinery and plant used in accordance with the provisions of the said Act and Associated Documentation

I acknowledge having received the necessary induction / training regarding the rules and regulations of the **Lower Sundays River Water User Association**. I will adhere to all the rules and regulations and relevant legislation. I will liaise with the person responsible, should I, for whatever reason, not be able to complete the task /project or perform in terms of this agreement.

I undertake to immediately report Environmental Incidents to the Environmental Officer via Email (xxxxx@ xxxxxxx) or Fax (086 600 4037):-

1. Any accidents or incidences involving my staff or subcontractors whether considered minor or significant shall be reported in writing.
2. Always inform the EO of any existing and/or new projects that my staff or subcontractors will be undertaking in or near a water course.

(Note to Compiler: Contact Details of EO updated as required)

Signature:

Date:

Witness (Full name):

Signed on behalf of **Lower Sundays River Water User Association**

Signature:

Date:

Witness (Full name):

PLEASE RETURN THE SIGNED DOCUMENT TO EO