	HEALTH, SAFETY & ENVIRONMENTAL (SHE) SPECIFICATION	
Johannesburg Water	PROJECT NUMBER:	JW OPS 024/21
	PROJECT LOCATION:	FENNELL ROAD DEPOT- FLOW LABORATORY
	PROJECT DESCR:	Supply, installation and commissioning of a gravimetric flow meter test bench at Flow Laboratory (Fennell Road Depot)

VOLUME 2

Occupational Health, Safety & Environmental Specification

JW OPS 024/21

Supply, installation and commissioning of a gravimetric flow meter test bench at Flow Laboratory (Fennell Road Depot)

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General Notification

This document forms an integral part of the Contract Specification and, in particular, shall constitute the Client's (Johannesburg Water SOC Ltd.) Occupational Health, Safety & Environmental (SHE) Specification, as required by the Construction Regulations, 2014, as promulgated under the Occupational Health and Safety Act (Act no. 85 of 1993). The Specification shall furthermore be applied for the management of Mandatories performing activities for or on behalf of Johannesburg Water SOC Ltd, irrespective whether the contract work constitutes construction work or not.

The Contract Specification is contained in Volume 1 of the contract documents in Part 3: Scope of Work.

Acknowledgements

This Occupational Health, Safety & Environmental (SHE) Specification was developed by the internal OHS Department for the sole use by Johannesburg Water SOC Ltd. The issue date of this SHE Specification is September 2016.

ABBREVIATIONS

Abbreviation	Description
CR	Construction Regulations
COID	Compensation for Occupational Injuries and Diseases
DoL	Department of Labour
GAR	General Administrative Regulations
GMR	General Machinery Regulations
GSR	General Safety Regulations
HCS	Hazardous Chemical Substances
HIRA	Hazard Identification and Risk Assessment
JW	Johannesburg Water (SOC) Ltd
MSDS	Material Safety Data Sheet
OHS	Occupational Health and Safety
PPE	Personal Protective Equipment
PER	Pressure Equipment Regulations
SANS	South African National Standards
SABS	South African Bureau Standard
SHE	Safety, Health & Environment
SOC	State Owned Company

DEFINITIONS

Word / Phrase	Definition
"WCL 1", "WCL 2" and "WCL 22"	Means the prescribed forms for reporting of incidents and occupational diseases referred to in the Compensation for Occupational Injuries and Diseases Act.
Competent Person	A person who has in respect of the work or task to be performed the required knowledge, training, experience and, where applicable, qualifications specific to that work or task: provided that where appropriate, qualifications and training are registered in terms of the provisions of the National Qualification Framework Act, 2000 (Act 67 of 2000).
Construction work	Any work in connection with: a) The construction, erection, alteration, renovation, repair, demolition or dismantling of or addition to a building or any similar structure b) the construction, maintenance, demolition or dismantling of any bridge, dam, canal, road, railway, runway, sewer or water reticulation system or any similar civil engineering structure; or the moving of earth, clearing of land, the making of an excavation, piling, or any similar type of work
Contractor (inclusive of Principal Contractor)	Any organization, person, entity performing activities for or on behalf of Johannesburg Water SOC Ltd.
Corrective Action	Action to eliminate the cause of a detected nonconformity or other undesirable situation.
Employee	Any person who is employed by or works for an employer and who receives or is entitled to receive any remuneration or who works under the direction or supervision of an employer or any other person
Employer	Any person who employs or provides work for any person and remunerates that person or expressly or tacitly undertakes to remunerate him, but excludes a labour broker as defined in section I (1) of the Labour Relations Act, 1956 (Act No. 28 of 1956)
Hazard	Means a source of or exposure to danger.
Hazard identification	The identification and documenting of existing or expected hazards to the health and safety of persons, which are normally associated with the type of construction work being executed or to be executed.
Incident	Means an incident as contemplated in section 24 (1) of the OHS Act 85 of 1993.
Machinery	means any article or combination of articles assembled, arranged or connected and which is used or intended to be used for converting any form of energy to performing work, or which is used or intended to be used, whether incidental thereto or not, for developing, receiving, storing, containing, confining, transforming, transmitting, transferring or controlling any form of energy
Mandatory	Includes an agent, a contractor or a subcontractor for work, but without derogating from his status in his own right as an employer or a user
Medical surveillance	Means a planned programme or periodic examination (which may include clinical examinations, biological monitoring or medical tests) of employees by an occupational health practitioner or, in prescribed cases, by an occupational medicine practitioner.
Method Statement	A document detailing the key activities to be performed in order to reduce as reasonably as practicable the hazards identified in any risk assessment.
Principal Contractor	Any employer who performs work and is appointed by the Client to be in overall control and management of the contract work (inclusive of Mandatories).

SHE File	A file or other record in permanent form, containing the information required as contemplated in the S.H.E Specification Document and legal requirements applicable to work activities.
SHE Plan	A documented plan which seeks to address all hazards identified means and ways to control and eliminate such to ensure compliance to the S.H.E Specification.
Workplace	Any physical location in which work related activities are performed under the control of the organization.

1. Introduction

In terms of Section 37 of the Occupational Health and Safety Act (Act no. 85 of 1993), Johannesburg Water SOC Ltd is required to control persons/organizations conducting activities for or on their behalf (Mandatories) and the Construction Regulations promulgated under the Occupational Health and Safety Act (Act no. 85 of 1993), is requiring Johannesburg Water SOC) Ltd. to compile an occupational health and safety specification for any intended project classified as construction work and to provide the specification to prospective tenderers / Mandatories.

The dual objective of this specification is to ensure that the Mandatories and Principal Contractors (herein after called Principal Contractor (including Mandatories)) entering into a contractual agreement/relationship with Johannesburg Water SOC Ltd. achieves and maintains an acceptable level of occupational health, safety and environmental performance whilst conducting activities to perform the contract work.

This document forms an integral part of the Contract Specification and, in particular, shall be the OCCUPATIONAL HEALTH, SAFETY AND ENVIRONMENTAL (SHE) SPECIFICATION FOR CONSTRUCTION WORK. The Contract Specification is contained in Volume 1 of the contract documents. The principal and other contractors shall ensure that this specification is included with any contract/s that they may have with other contractors and/or suppliers that are engaged for the provision of labour, goods or services for this project. The Principal Contractor and its Contractors shall furthermore implement any reasonable practicable means to ensure compliance to this Occupational Health, Safety and Environmental (SHE) Specification and any other applicable legislation on their organization and/or activities performed by or for them. This SHE Specification will be read in conjunction, where issued and applicable, with the Environmental Specification issued for listed activities requiring environmental authorization by a relevant authority.

Compliance with this SHE specification does not absolve the Principal Contractor from complying with any other applicable minimum legal requirement and the Principal Contractor remains responsible for the sustainable integrity of the environment and the health and safety of its employees, mandatories as well as any persons affected by activities conducted for or on behalf of Johannesburg Water SOC Ltd (SOC) Ltd..

1.1 Johannesburg Water SOC Ltd's commitment to Occupational Health, Safety & Environmental (SHE) Management

Johannesburg Water SOC Ltd is committed to responsible occupational health, safety and environmental management. This commitment is essential to protect the environment, employees, Mandatories, visitors and provide a work environment conducive to health and safety. Principal Contractors and their Contractors shall demonstrate their commitment and concern by:

- Ensuring that decisions and practices affecting occupational health, safety and environmental performance are consistent with the issued SHE specification;
- Ensuring adequate resources are made available for the effective implementation of occupational health, safety and environmental control and mitigation measures;
- Participating in hazard identification and risk assessments and design safety reviews;
- Communicating occupational health, safety and environmental management processes, strategies and control measures with all levels of employees, contractor and/or visitors;
- Ensuring visible leadership at all sites;

- Promoting and enforcing the use of correct types of Personal Protective Equipment (PPE);
- Reporting and investigation of incidents and accidents and ensuring actions are identified and implemented to prevent similar types of incidents reoccurring;
- Participating in Client audits and meetings and ensuring required actions are implemented within reasonable time frames on the site/project;
- Recognizing and commending safe work practices and coaching employees who require guidance;
- Applying and enforcing consequence management from deviations and transgressions of/from compliance to this SHE Specification noted and/or observed, where applicable;
- Carrying out safety observations, implement corrective and preventative actions and giving immediate feedback;
- Encouraging employee participation in the formulation of work instructions and safety rules.

1.2 Scope of Occupational Health, Safety and Environmental (SHE) Specification

The scope of this Occupational Health, Safety and Environmental (SHE) Specification is to address the reasonable and foreseeable aspects of occupational health, safety and environmental management, which will be affected by the contract work.

The specification will provide the requirements that the Principal Contractor and other Contractors shall comply with in order to reduce the risks associated with the contract work, and that may lead to incidents causing injury and/or ill health or degradation of the environment, to a level as low as reasonably practicable and possible.

In particular, Johannesburg Water SOC Ltd will ensure that it shall not appoint any Principal Contractor unless it is reasonably satisfied that the contractor which it intends to appoint has the necessary competencies and resources to carry out the work safely.

1.3 Omissions from SHE Specification

Where any omission from the SHE Specification is identified, applicable legal requirements will constitute the minimum standard for compliance to the relevant omission. The responsibility will be on the Principal Contractor to provide assurance to Johannesburg Water SOC Ltd on compliance to the applicable legal requirements related to the activity / task / process.

1.4 Change management

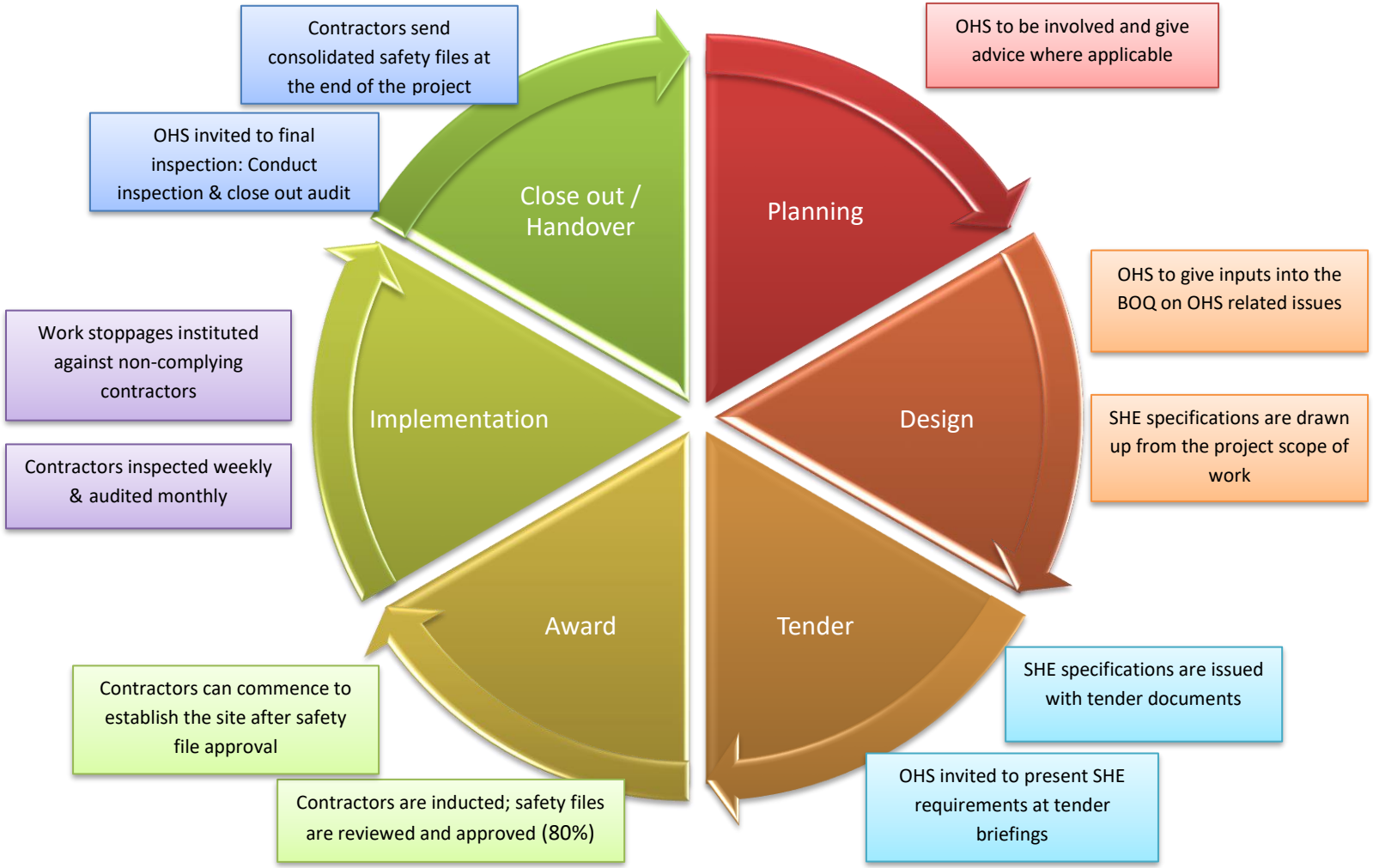
Whenever Johannesburg Water SOC Ltd identifies the need to change or review the SHE Specification, approved changes and revisions will be communicated to the Principal Contractor. A cost analysis on the implementation of the proposed changes / revisions will be calculated through a collaborative processes between Johannesburg Water SOC Ltd and the Principal Contractor – where the approved changes and/or revisions has no cost implication for the Principal Contractor the Principal Contractor will be required to accept the approved changes / revisions and ensure implementation within the SHE Plan / File framework.

2 Overview of contractor management process

The contractor management process consists of the following phases:

- Tender briefing and tender documentation;
- Competency evaluation of Principal Contractors (integrated into Supply Chain Management processes);
- Appointed contractor to attend SHE system induction;
- Preparation of SHE File by Principal Contractor;
- Evaluation of SHE File;
- Principal Contractor engagement phase;
- Project close-out and submission of consolidated Health & Safety File.

2.1 CONTRACTOR MANAGEMENT PROCESS


Contractors send consolidated safety files at the end of the project
OHS to be involved and give advice where applicable
OHS invited to final inspection: Conduct inspection & close out audit
Close out / Handover
Planning
OHS to give inputs into the BOQ on OHS related issues
Work stoppages instituted against non-complying contractors
Implementation
Design
SHE specifications are drawn up from the project scope of work
Contractors inspected weekly & audited monthly
Award
Tender
SHE specifications are issued with tender documents
Contractors can commence to establish the site after safety file approval
OHS invited to present SHE requirements at tender briefings
Contractors are inducted; safety files are reviewed and approved (80%)

2. SHE DOCUMENTATION

2.1 Safety file

The Principal Contractor will prepare a SHE File containing the processes / procedures and templates to be applied during the project period for the scope of work. The Principal Contractor will be evaluated during the contract period against the submitted SHE File.

Ata minimum the SHE File will contain the following documentation:

- Notification of construction work to the relevant Department of Labour (stamped on each page / no faxed copies);
- Scope of work to be performed;
- Personnel list (Principal Contractor employees);
- OH&S / SHE Policy and other Policies;
- Updated copy of the Occupational Health and Safety Act (Act no. 85 of 1993) and its Regulations; COID Act.
- Proof of valid registration and good standing with the Compensation Commissioner or another licensed Insurer;
- SHE Plan agreed with Johannesburg Water SOC Ltd.
- Approved risk assessments, review and monitoring plans and safe work procedures (method statements);
- A list of contractors (sub-contractors) including copies of the agreements between the parties and the type of work being done by each contractor;
- All written designations and appointments for project scope of work (CV and competency copies);
- Management structure (inclusive of OH&S responsibility & meeting structure);
- Induction training and site SHE rules;
- Occupational health and safety training matrix / plan;
- Arrangements with contractors and/or mandatories;
- Description of security measures;
- The following registers (as applicable to contract scope of work):
    - Accident and/or incident notifications, investigation & control register;
    - Occupational health and safety representatives inspection register;
    - Template for entry into confined space;
    - Toolbox talks pro-forma;
    - Fall protection inspections template;
    - First-aid box content template;
    - Record of first-aid treatment template;
    - Fire equipment inspection and maintenance template;
    - Ladder inspection template;
    - Machine safety inspections template (including machine guards, lock-outs etcetera);
    - Inspection templates for lifting machines and –tackle (including daily inspections by drivers/operators);
    - Inspection templates of scaffolding;
    - Inspections templates of structures;
    - Templates of issuing of Personal Protective Equipment;
    - Monthly reporting and recording of statistics templates;
    - Keeping of any other record in terms of applicable legislation falling within the scope of SHE Legislation applicable to the project and the Principal Contractor / Contractor's activities and organization.
- Emergency preparedness and response programmes;
- Medical examination tests
- Vaccination records

2.2 Principal contractor appointment

- The principal contractor will be appointed in terms of Construction Regulations 2014, Reg 5(1) k
- All responsibilities imposed on the contractor by the Regulations will be applicable
- The duties will include:
  a) Prepare a site specific SHE file based on client SHE specification and project scope.
  b) Have an updated Letter of Good standing.
  c) Ensure the necessary legal appointment letters are compiled and signed by affected parties.
  d) Ensure SHE file submitted before work commences to Johannesburg Water for evaluation and approval.
  e) Must ensure an organizational medical programme for its employees is in place. This must address pre-employment, periodic examination, and exit examinations.
  f) Ensure all employees undergo medical examination and are declared fit for the job they are employed for by a Medical Practitioner.
  g) All employees undergo his control undergo company specific induction and Johannesburg water induction.
  h) Ensure before work commences employees are trained on the health and safety risks associated with the work they are conducting.
  i) Ensure employees are trained on company procedures, policies, method statements and informed of the Johannesburg Water SHE requirements as per the specification.
  j) Ensure legislative requirements are complied with during the duration of the contract and ensure that their employees comply also.
  k) Sign the 37 (2) Agreement between Johannesburg Water and themselves before any work commences and kept on their SHE file.
  l) Ensure that 37(2) Agreement(s) are signed between themselves and their sub-contractors.
  m) Ensure that sub-contractors have valid Compensation Commissioner Letter of Good Standing.
  n) Have a disciplinary procedure to address those found to be transgressing requirements of SHE specification, SHE plan, site rules or any other OHS act and its Regulation requirement.
  o) Prevent any employee or visitor who is under the influence of any alcohol or drugs (in state of intoxication) from being allowed to site.
  p) Ensure the safety of employees who are taking legal medication.
  q) Must hand over a consolidated SHE file at the end of the contract.
  r) Stop his/her employees who are doing unsafe acts or who are creating an unsafe environment.
  s) Investigate all incidents and report to Johannesburg water and ensure all reportable incidents as per the legislative requirement are complied with.
  t) Ensure work is supervised by competent personnel and that work is done by competent employees.
  u) Ensure pre-task risk assessment is done by a competent person and that employees are informed of the pre-task risks and the risk control measures.
  v) Ensure tool box talks are conducted to communicate SHE issues in connection to the work being done and any other aspects.
  w) Ensue that appointed personnel as per the SHE file are executing their duties as per the legal appointment.
  x) Ensure first aid kit is made available in case of any emergency.
  y) Ensure that housekeeping is maintained in good condition and that materials are store/stacked properly is designated areas.
  z) Have sufficient waste receptacles and ensure the correct disposal of the different wastes.
  aa) Proof of hazardous waste disposal to be requested from disposal site and to be kept inside SHE file.
  bb) Take reasonable steps to ensure that each appointed sub-contractor health and safety plan is implemented and maintained on the site and SHE File documentation is up to date.
  cc) Stop any work from being executed which is not in accordance with the client's health and safety specification and the principal contractor's health and safety plan for the site or which poses a threat to the health and safety of persons.

dd) Must maintain an up to date list of all the sub-contractors on site accountable to the principal contractor, the agreements between the parties and the type of work being done; and
ee) Ensure that all his or her employees have a valid medical certificate of fitness.

2.3 37.2 Agreement

- Johannesburg Water will enter into a 37(2) Agreement with all the appointed contractors
- A copy of the 37(2) Agreement must be kept in the SHE file of the contractor at all times.
- It is the responsibility of the contractor to ensure that there are 37(2) agreements between themselves and all their appointed sub-contractors.

2.4 SHE Plan

- The contractor shall prepare a SHE plan to address and manage all applicable sources of risk that are identified during the execution of the project. The SHE plan shall incorporate the requirements as listed in the SHE specification.
- A copy of the SHE plan shall be submitted together with SHE file for review and approval.
- It is the contractor responsibility to ensure they sub-contractor compiles a SHE plan that in line with the SHE specification requirement of Johannesburg Water.

2.5 Legislative framework

All contractors shall comply with legislation pertaining to this contract, including but not limited to:

- Constitution of the Republic of South Africa
- Occupational Health and Safety Act and its associated Regulations
- National Environmental Management Framework Legislation
- National Road Traffic Act
- Applicable South African National Standards (SANS)
- Compensation of Occupational Injuries and Diseases Act (COID)
- Local by-laws and provincial ordinances

2.6 SHE Policy

A SHE policy is a statement of intent and a commitment by the organization Chief Executive or Managing Director (OHS Act 16(1) appointee) in relation to requirements applicable to their Safety, Health and Environmental legal obligation, relevant SHE roles and responsibilities, and contractual obligations to the Client.
The contractor and their sub-contractor companies shall each have a documented SHE Policy authorized by their Chief Executive/Managing Director (OHS Act Section 16 (1) Appointee). The SHE Policy must meet the following minimum requirements;

- Organizational Mission and Goal.
- State the overall SHE objectives within the project.
- Show commitment to the prevention of injuries and ill-health.
- Show commitment to the protection of environment and the conservation of natural resources.
- Must be reviewed at predetermined intervals, or when there is change in work process, serious incident occurs.
- The SHE Policy must be in line with OHSAS 18001 and ISO 14001 requirements and guidance documentation.
- Must be authorized by contractor CEO.

2.7 Appointments and competencies

- The contractor and its appointed sub-contractor must make the relevant legislative and non-statutory appointments, which must be maintained valid for the entire contract duration.

- All appointees shall be suitably trained and certified competent for the responsibilities they are assigned for.
- Copies of all relevant appointments and the relevant competence certificates must be kept in the relevant SHE file.

Appointment index

Appointment	Legislative Ref	Competency requirements (Min)
Alternate Construction Manager	CR 8.1	N.Dip Eng. + 4yrs exp
Assistant Construction Manager	CR 8.2	N.Dip Eng. + 4yrs exp
Assistant Construction Supervisor	CR 8.8	-
Bulk mixing plant	CR 20	Certificate
Confined Space Supervisor	GSR 5	Certificate + Proven experience
Construction Manager	CR 8.1	N.Dip Eng. + 4yrs exp
Construction Health and Safety Officer	CR 8.5	N.Dip Safety + 2yrs exp; OR N.Dip Enviro + 3yrs exp; OR NEBOSH / SAMTRAC + 4yrs exp Register with SACPCMP
Construction supervisor	CR 8.7	3 yrs experience
Construction vehicle & mobile plant supervisor	CR 23.1	Certificate
Electrical installation and appliances inspector	CR 24	
Emergency, security and fire coordinator	CR 29	Certificate
Excavation supervisor (including piling)	CR 13	3yrs exp / N.Dip building
Explosive actuated fastening device inspector	CR 21	Certificate
Fall protection supervisor	CR 10.1	Certificate
First-aiders	GSR 3	Certificate
Fire fighting equipment inspector	CR 29	Certificate
General Machinery Supervisor	GMR 2.1/7	GCC (GMR 2.1)/ 3yrs exp (GMR 2.7)
Temporary work supervisor (Formwork)	CR 12.2	N.Dip building + 4yrs exp
Hazardous chemical substances supervisor	HCS Regs	Certificate
Incident investigator	GAR 9.2	Certificate
Ladder inspector	GSR 13A	-
Lifting machines and equipment inspector	DMR 18.5	Certificate + 3yrs experience

Materials hoist inspector	CR 19.8	Certificate
Occupational health and safety committee	OHS Act 19	-
Occupational health and safety representatives	OHS Act 17	Certificate
Risk assessor	CR 9.1	Certificate
Stacking and storage supervisor	CR 28	Certificate
Structures supervisor	CR 11.2	N.Dip building + 4yrs exp
Suspended platform supervisor	CR 17.1	Certificate
Vessels under pressure supervisor	PER 12	Certificate
Welding supervisor	GSR 9	Certificate

2.8 Insurances

- The principal contractor and all his appointed contractors shall be registered with an appropriate compensation commissioner and have available a valid letter of good standing at all times.
- The obligation lies with the contractor to ensure that the Letter of Good Standing remains valid throughout the entire duration of the project.
- A copy of the said letter must be filed in all SHE files and made available during inspections and audits.

2.9 Costing for SHE

The contractor is responsible for ensuring that SHE costing is taken into consideration for the entire project/contract as this will ensure they comply with the SHE legislative requirements.

2.10 Sub-contractors

- Whenever the Principal Contractor appoints contractors or sub-contractors, it is a requirement that an Occupational Health and Safety Act (Act no. 85 of 1993) Section 37(2) agreement (i.e. Agreement with Mandatory) is entered into between the Principal Contractor and Contractors.
- The Principal Contractor will ensure that all appointed contractors comply with the Johannesburg Water SOC Ltd SHE Specification requirements.
- The Principal Contractor will establish a procedure on sub-contractor management and assurance on compliance to the established procedure will be provided to Johannesburg Water SOC Ltd on a monthly basis.
- Principal Contractors are required to formally notify Johannesburg Water SOC Ltd before appointing subcontractors.
- Johannesburg Water SOC Ltd shall approve all specialist subcontractors to be appointed and/or engaged by the Principal Contractor.

The Principal Contractor shall:

- Ensure prior to work commencing on the site that every contractor is registered and in good standing with the compensation fund or with a licensed compensation insurer as contemplated in the Compensation for Occupational Injuries and Diseases Act, 1993;
- Appoint each contractor in writing for the part of the project on the construction site;
- Take reasonable steps to ensure that each contractor's health and safety plan is implemented and maintained on the construction site;
- Ensure that the periodic site audits and document verification are conducted at intervals mutually agreed upon between the principal contractor and any contractor, but at least once every 30 days;
- Stop any contractor from executing construction work which is not in accordance with the client's health and safety specifications and the principal contractor's health and safety plan for the site or which poses a threat to the health and safety of persons;

- Include and make available a comprehensive and updated list of all the contractors on site accountable to the principal contractor, the agreements between the parties and the type of work being done; and
- Ensure that all his or her employees have a valid medical certificate of fitness specific to the construction work to be performed and issued by an occupational health practitioner in the form of Annexure 3.

2.11 Notification of construction work

- The Principal Contractor shall, before carrying out any work, notify the relevant Department of Labour of the intention to carry out construction work and use the form (*Annexure 2 in the Construction Regulations 2014*) for this purpose.
- Only a certified copy stamped (each page) by the Department of Labour will be acceptable. No faxed or emailed notifications will be accepted.
- No work shall commence before the Principal Contractor has submitted notification of construction work to the relevant Department of Labour.
- Johannesburg Water SOC Ltd will not approve the SHE File if no original stamped / certified copy of the notification of construction work has been done.

2.12 Construction work permit

- There will be no requirement for a construction work permit for this project.

3. ORGANISATIONAL STRUCTURE

- The contractor shall develop and submit together with SHE file an organizational organogram related to the contractor, listing all the levels of responsibility from the Chief Executive down to the supervisor(s) responsible for the project.
- The organogram diagram must list all relevant positions, names of appointees and legal appointments.
- The contractor is responsible for updating the organogram timeously when there are changes to the appointments.
- All appointed sub-contractors are also required to compile their own organograms.

4. COMMITMENT TO SHE

- Visible commitment is essential to providing a safe working environment.
- Managers, supervisors and employees at all levels must demonstrate their commitment by being proactively involved in the day to day SHE operations.
- Legislation requires that each employee takes reasonable care of themselves and their fellow workers

5. HIRA

Annexure 1: List of possible hazards emanating from projects and activities conducted for or on behalf of Johannesburg Water SOC Ltd includes an assessment of site specific health and safety hazards and risks and environmental aspects and impacts that have been identified by Johannesburg Water SOC Ltd as possibly applicable to the contract work for this project. It is by no means exhaustive and is offered as assistance to the tenderers and contractors.

Development of risk assessments

Every Contractor performing construction work shall, before the commencement of any construction work or work associated with the construction work, and during construction work, ensure that a risk assessment is undertaken by a competent person, appointed in writing, and the risk assessment shall form part of the SHE plan to be applied on the site. Risk assessments shall identify occupational health and safety hazards and risks and environmental aspects and impacts emanating from the activity to be performed by the Principal Contractor / Contractor.

The risk assessment (inclusive of impact assessment) shall include (at a minimum):

- Identification of the relevant Johannesburg Water SOC Ltd Project with regard to JW Number, Project name and area;
- Date on which risk assessments were conducted / reviewed;
- The identification of the risks / hazards and aspects / impacts to which persons may be exposed to per activity;
- The analysis and evaluation of the risks / hazards and aspects / impacts identified;
- Existing control measures and proposed corrective measures;
- A plan to review the risk assessments as the work progresses and changes are introduced;
- Identification of significant risks (e.g. high; exceeding 75%);
- A documented plan of Safe Working Procedures (SWP)', and its relevance to the risk assessment, inclusive of method statements, to mitigate, reduce or control the risks and hazards that have been identified;
- A plan to monitor the application of the Safe Working Procedures (SWP);
- Signature of appointed competent person conducting risk assessment; and
- Signature of approval by Principal Contractor management and employees involved in risk assessment.

Based on the risk assessments, the Principal Contractor must develop a set of site-specific occupational SHE rules that will be applied to regulate the health, safety and environmental hazards/aspects of the construction work.

The risk assessments, together with the site-specific occupational health and safety rules, must be submitted to Johannesburg Water SOC Ltd before mobilisation on site commences. These will be included in the SHE plan. The Contractor shall ensure through his risk management process the hierarchy of controls stipulated as follows, are implemented:

- ***Eliminate*** - The complete elimination of the hazard.
- ***Substitute*** - Replacing the material or process with a less hazardous one.
- ***Redesign*** - Redesign the equipment or work process.
- ***Separate*** - Isolating the hazard by guarding or enclosing it.
- ***Administrate*** - Providing control such as training, procedures etc.
- ***Personal Protective Equipment (PPE)*** - Use of appropriate and properly fitted PPE where other controls are not practical. (PPE as the last resort)

The Principal Contractor will be required to carry out the following three forms of risk assessment:

- Baseline risk assessment;
- Issue based risk assessment;
- Continuous risk assessments.

Baseline risk assessments

The Principal Contractor is required to develop a baseline risk assessment taking the resources, competency levels, nature and scale of their organization into consideration for submission during SHE File evaluation phase. The hazards and risks to which persons, plant, vehicles and facilities may be exposed during the construction should be identified and evaluated. The aspects and impacts resulting in environmental pollution or degradation should also be identified and evaluated. Measures to reduce or control these risks or hazards should be defined during this assessment. The effectiveness of the measures defined and the baseline risk assessment prepared shall be monitored and reviewed from time to time to ensure that it remains relevant and accurate.

Issue based risk assessments

The Contractor will be required to carry out separate risk assessments during construction of the project when methods and procedures are varied, for example when:

- Designs are amended;
- New machines are introduced;
- Plant is periodically cleaned and maintained;

- Plant is started-up or shut-down;
- Systems of work change or operations alter;
- Indents or near-misses occur; or
- Technological developments invalidate prior risk assessments.

Continuous risk assessments

The Occupational Health and Safety Act (Act no. 85 of 1993) specifically requires that employers shall provide and maintain working environments that are safe and without risk to health. The general awareness of hazards needs to be raised as work ethic to maintain a safe and risk free environment on an on-going basis. This is achieved by continuous risk assessments, a form of risk assessment that takes place as an integral part of day-to-day management. Examples of continuous risk assessments include:

- Maintaining general hazard awareness, and
- Pre-work risk assessments / Daily Safety Task Instructions.

Occupational health and safety risks or environmental impacts that are identified during the risk assessment process shall be communicated before the commencement of the said activity to every employee whose work is associated with the risk. Each employee shall sign to confirm understanding of the safety, health or environmental risks in the tasks.

Review of risk assessments

The Principal Contractor is required to review the hazards identified, the risk assessments and the Safe Work Procedures as the contract work develops and progresses and each time changes are made to the designs, plans and construction methods and/or processes. Revisions to the approved risk assessments and Safe Work Procedures will be presented at each production planning and progress meeting.

Risk assessments are to be reviewed whenever there is change on the scope of work, process, and accidents or when required by Johannesburg Water SOC Ltd

The Principal Contractor must provide Johannesburg Water SOC Ltd, other contractors and all other concerned or affected parties with copies of any changes, alterations or amendments to risk assessments and Safe Work Procedures within 14 days of such changes.

6. SAFE WORK PROCEDURES / METHOD STATEMENTS

Method statements or written safe work procedures shall be documented for all high risk activities:

- Design change or scope change/addition
- Change in job or task
- Introduction of new machinery, equipment or substance.

Method statements or written safe work procedures shall identify following:

- Tasks that are to be undertaken
- The hazards and associated risks of the task(s)
- The control measures for the task(s)
- The equipment and substances that are associated with task(s)
- Any training or qualification needed to do the task
- Personal protective equipment to be worn.

7. INCIDENT MANAGEMENT

7.1 Reporting of accidents and incidents

The Principal Contractor must report all incidents where an employee is injured on duty to the extent that he:

- Dies
- Becomes unconscious

- Loses a limb or part of a limb
- Is injured or becomes ill to such a degree that he is likely either to die or to suffer a permanent physical defect or likely to be unable for a period of at least 14 days either to work or continue with the activity for which he was usually employed

Or where -

- A major incident occurred
- The health or safety of any person was endangered
- Where a dangerous substance was spilled
- The uncontrolled release of any substance under pressure took place
- Machinery or any part of machinery fractured or failed resulting in flying, falling or uncontrolled moving objects
- Machinery ran out of control

to Johannesburg Water SOC Ltd within two days and to the Provincial Director of the Department of Labour within seven days from date of incident (Section 24 of the Occupational Health and Safety Act (Act no. 85 of 1993) and General Administrative Regulations), except that, where a person has died, has become unconscious for any reason or has lost a limb or part of a limb or may die or suffer a permanent physical defect, the incident must be reported to both Johannesburg Water SOC Ltd and the Provincial Director of the Department of Labour forthwith by telephone, telefax or e-mail.

- All other reports required by this specification must also be completed. Reporting of accidents / incidents to Johannesburg Water SOC Ltd will be on the prescribed format.
- The Principal Contractor is required to provide Johannesburg Water SOC Ltd with copies of all statutory reports required in terms of the Occupational Health and Safety Act (Act no. 85 of 1993) within 7 days of the incident occurring.
- The Principal Contractor is required to provide Johannesburg Water SOC Ltd with copies of all internal and external accident/incident investigation reports, within 7 days of the incident occurring.

7.2 Accident and incident investigation

- The Principal Contractor is responsible for the investigation of all accidents and/or incidents where employees and non-employees were injured to the extent that they had to receive medical treatment other than first aid.
- The results of the investigation are to be entered into the accident and/or incident register. The Principal Contractor is responsible for the investigation of all incidents, including those described in Section 24 (1) (b) and (c) of the Occupational Health and Safety Act (Act no. 85 of 1993) and for keeping a record of the results of the investigations including the steps taken to prevent similar accidents in future.
- The Principal Contractor is responsible for the investigation of all road traffic accidents, related to the construction activities, and for keeping a record of the results of the investigations including the steps taken to prevent similar accidents in future.
- Johannesburg Water SOC Ltd reserves the right to hold its own investigation into an incident or call for an independent external investigation.

7.3 Close out

- All incident investigation reports will be closed out once all the recommendations to prevent further incidents have been implemented.
- A copy of the investigation report must be handed to JW Safety Officer conducting the investigation.

8. MEDICAL SCREENING REQUIREMENTS

- The Principal Contractor shall ensure that a medical surveillance programme is implemented for all employees.
- An initial health evaluation shall be carried out by an occupational health practitioner immediately, before or within 14 days after a person commences employment, where any exposure exists or may exist, which comprises:
  - an evaluation of the employees medical and occupational history;
  - a physical examination; and
  - any other essential examination which in the opinion of the occupational health practitioner is desirable in order to enable the practitioner to do a proper evaluation.
- Medical surveillance and immunisation shall be done accredited at / by institutions or occupational health personnel, including, but not limited to:
  - Audiograms.
  - A cardio-respiratory examination / Lung function test;
  - Chest X-rays
  - Eye/ sight tests.
  - A general physical examination;
  - A review of previous medical history.
  - Glucose levels
  - Blood pressure

- An entry medical certificate shall be obtained for all workers prior to commencing with site activities from approved medical institution. Copies of all medical certificates shall be retained in the SHE File prior to site establishment and before an employee is allowed to come onto site.
- Specific attention shall be given to the physical and psychological fitness of people who will be required to work in elevated positions and operators of mobile machinery.
- An exit medical certificate shall be obtained for all workers at the end of the contract and for all workers who leave the employment of the Contractor before the end of the Project. Copies of all exit medical certificates shall be submitted to the Johannesburg Water SOC Ltd Project Specialist or Appointed OHS Agent.

9. ENVIRONMENTAL MANAGEMENT

9.1 Air pollution management

The following requirements for air pollution management shall apply:

- Speed limits must be implemented in all areas, including public roads and private property to limit the levels of dust pollution.
- Dust must be suppressed on access roads and construction sites during dry periods by the regular application of water or a biodegradable soil stabilisation agent. Water used for this purpose must be used in quantities that must not result in the generation of run-off.
- The site-specific investigation will quantify the impact of dust on nearby wetlands, rivers and dams in terms of sedimentation. Mitigation measures identified during the site specific study must be implemented.
- The Contractor must notify the Principal of all schools within 50m of the site of proposed activities. The Principal must in turn ensure that children with allergies and respiratory ailments take the necessary precautionary measures during the construction period. The Contractor must ensure that construction activities do not disturb school activities e.g. dust clouds may reduce visibility affecting sports activities.
- Waste must be disposed of, as soon as possible at a municipal transfer station, skip or on a permitted landfill site. Waste must not be allowed to stand on site to decay, resulting in malodours.
- Noise control measures must be implemented. All noise levels must be controlled at the source. All employees must be given the necessary ear protection gear. Interested and affected parties must be informed of the excessive noise factors.
- The Contractor must inform all adjacent landowners of any after-hour construction activities and any other activity that could cause a nuisance e.g. the application of chemicals to the work surface. Normal working hours must be clearly indicated to adjacent landowners.

- No loud music is allowed on site and in construction camps.
- No fires are allowed if smoke from such fires will cause a nuisance to IAPs.

9.2. Social and cultural impact management

The following requirements for social and cultural impact management shall apply:

- Access by non-construction people onto any construction sites must be restricted. The Contractors activities and movement of staff must be restricted to designated construction areas only.
- Rapid migration of job seekers could lead to squatting and social conflict with resident communities and increase in social pathologies if not properly addressed. The Contractor must ensure that signs indicating the availability of jobs are installed.
- Criteria for selection and appointment (by the Contractor) of construction labour must be established to allow for preferential employment of local communities. The Local Authority must be actively involved in the process of appointing temporary labourers.
- Sub-Contractors and their employees must comply with all the requirements of this document and supporting documents e.g. the Contract document that applies to the Contractor. Absence of specific reference to the sub-contractor in any specification does not imply that the sub-contractor is not bound by this document.
- No member of the construction workforce is allowed to wander around private property, except within the immediate surroundings of the site.
- The Contractor must provide suitable sanitation facilities for site staff. Sanitation provided during the construction phase should be managed so that it does not cause environmental health problems. The use of the surrounding veld for toilet purposes is not permitted under any circumstance.
- The Contractor must arrange for all his employees and those of his sub-contractors to be informed of the findings of the environmental report before the commencement of construction to ensure:
    - A basic understanding of the key environmental features of the work site and environments, and
    - Familiarity with the requirements of this document and the site-specific report.
- Supervisory staff of the Contractor or his sub-contractors must not direct any person to undertake any activities which would place such person in contravention of the specifications of this document endanger his/her life or cause him/her to damage the environment.
- The demand for construction materials and supplies will have an effect on the local economy. Sourcing and purchasing materials locally and regionally wherever possible, insofar as the material complies with the design specification can optimise this impact.
- The Contractor must maintain a detailed complaints register. This must be forwarded, together with solutions, to the authorities when requested.

9.3 Aesthetic and visual impact management

The following requirements for aesthetic and visual impact management shall apply:

- Scenic quality:
    - Damage to the natural environment must be minimized.
    - Trees and tall woody shrubs must be protected from damage to provide a natural visual shield. Excavated material must not be placed on such plants and movement across them must not be allowed, as far as practical.
    - The clearing of all sites must be kept to a minimum and surrounding vegetation must, as far as possible, be left intact as a natural shield.
    - No painting or marking of natural features must be allowed.
- Above ground structures:
    - All above ground structures should be located in areas where the visual impact from roads, houses etc. is minimised.
    - All above ground structures could be treated or painted to blend in with the natural environment.
    - Cut and fill areas, river and stream crossings and other soil stabilisation works must be constructed to blend in with the natural environment.

- Natural outcrops, rocky ridges and other natural linear features must not be bisected. Vegetation on such features must, as far as possible, not be cut unless absolutely necessary for construction.
- Excavated material must be flattened (not compacted) or removed from site. No heaps of spoil material must be left on site once the Contractor has moved to a new construction site.
- Any complaints from interest groups regarding the appearance of the construction site must be recorded and addressed promptly by the Contractor.

9.4 **Archaeology and cultural sites management**

The following requirement for archaeology and cultural site management shall apply:

- All finds of human remains must be reported to the nearest police station.
- Human remains from the graves of victims of conflict, or any burial ground or part thereof which contains such graves and any other graves that are deemed to be of cultural significance may not be destroyed, damaged, altered, exhumed or removed from their original positions without a permit from the South African Heritage and Resource Agency (SAHRA).
- Work in areas where artefacts are found must cease immediately.
- Under no circumstances must the Contractor, his/her employees, his/her sub-contractors or his/her sub-contractors' employees remove, destroy or interfere with archaeological artefacts. Any person who causes intentional damage to archaeological or historical sites and/or artefacts could be penalised or legally prosecuted in terms of the National Heritage Resources Act, 25 of 1999.
- A fence at least 2m outside the extremities of the site must be erected to protect archaeological sites.
- All known and identified archaeological and historical sites must be left untouched.
- Work in the area can only be resumed once the site has been completely investigated. The Project Manager will inform the Contractor when work can resume.
- The replacement of memorial stones removed by the contractor, to be replaced in original state after the completion of work.

9.5 **Flora and fauna management**

The following requirements for flora and fauna management shall apply:

Flora:

- All suitable and rare flora and seeds must be rescued and removed from the site. They must be suitably stored, for future use in rehabilitation.
- The felling and/or cutting of trees and clearing of bush must be minimised.
- Bush must only be cleared to provide essential access for construction purposes.
- The spread of alien vegetation must be minimized.
- The Contractor must document any incident of unauthorised removal of plant material, as well as accidental damage to priority plants.
- Woody vegetative matter stripped during construction must either be spread randomly throughout the surrounding veld so as to provide biomass for other microorganisms and habitats for small mammals and birds, or it may be stockpiled for later redistribution over the reinstated top soiled surface.
- No vegetative matter must be burnt or removed for firewood other than those removed during the grubbing and clearing phase. Such vegetation can be made available to the local inhabitants to be used as firewood.
- No tree outside the footprint of the Works area must be damaged.

Fauna:

- No species of animal may be poached, snared, hunted, captured or wilfully damaged or destroyed.
- Snakes and other reptiles that may be encountered on the construction site must not be killed unless the animal endangers the life of an employee.
- Anthills and/or termite nests that occur must not be disturbed unless it is unavoidable for construction purposes.
- Disturbances to nesting sites of birds must be minimized.
- The Principal Contractor must ensure that the work site is kept clean and free from rubbish, which could attract pests.

9.6. **Environmental infrastructure and facility management**

The following requirements for environmental infrastructure and facility management shall apply:

- The relevant authorities must be notified of any interruptions of services, especially the Local Municipality, National Road Agency, Spoornet, TELKOM and ESKOM etc. In addition, care must be taken to avoid damaging major and minor pipelines and other services.
- The integrity of property fences must be maintained.
- No telephone lines must be dropped during the construction operations, except were prior agreement by relevant parties is obtained. All crossings must be protected, raised or relocated as necessary.
- All complaints and/or problems related to impacts on man-made facilities and activities must be promptly addressed by the Contractor and documented.
- Storage Facilities
    - Proper storage facilities should be provided for the storage of oils, grease, fuels, chemicals and hazardous materials.
    - The Contractor must ensure that accidental spillage does not pollute soil and water resources.
    - Fuel stock reconciliation must be done on all underground tanks to ensure no loss of oil, which could pollute groundwater resources.
    - Cement must be stored and mixed on an impermeable substratum.
- Traffic Control
    - All reasonable precautions must be taken during construction to avoid severely interrupting the traffic flow on existing roads, especially during peak periods.
    - Before any work can start the Local Traffic Department must be consulted about measures to be taken regarding pedestrian and vehicular traffic control.
- Access Roads
    - The Contractor and the affected landowner must collaborate on the planning and construction of new access routes and the repair or upgrading of existing routes.
    - Access to the site must be controlled such that only vehicles and persons directly associated with the work gains access to the site.
    - Temporary access roads must not be opened until required and must be restored to its former state as soon as the road is no longer needed.
- Batching Plants
    - Concrete must be mixed only in an area demarcated for this purpose. All concrete spilled outside this area, must be promptly removed by the Contractor and taken to a permitted waste disposal site. After all concrete mixing is complete; all waste concrete must be removed from the batching area and disposed of at an approved dumpsite. Storm water must not be allowed to flow through the batching area. Water laden with cement must be collected in a retention area for evaporation and not allowed to escape the batching area. Operators must wear suitable safety clothing.
- Chemical flushing toilet facilities should be managed and serviced by a qualified company. No disposal or leakage of sewerage should occur on or near the site.
- Blasting
    - Blasting must not endanger public or private property.
    - Noise mufflers and/or soft explosives must be used to minimize the impact on animals.
    - All the provisions of the Explosives Act, 26 of 1956 and the Minerals Act, 50 of 1991 must be complied with.
    - The Contractor must take measures to limit fly rock.

9.7 **Environmental health and safety consequences**

The following requirements for environmental health and safety consequences shall apply:

- Measures must be taken to prevent any interference that could result in flashover of power lines due to breaching of clearances or the collapse of power lines due to collisions by vehicles and equipment.
- Measures must be taken during thunderstorms to protect workers and equipment from lightning strikes.
- All tall structures must be properly earthed and protected against lightning strikes.

- The Contractor must take all the necessary precautions to protect the materials on site and to avoid veld fires.
- No fires or open flames are allowed on site unless directly used for construction purposes, e.g. acetylene blowtorch.
- Review all SABS standards relating to fire precautions and fire control namely, SABS 0131-3 Section 8 and SABS 089-1 or as amended.
- The Contractor must have fire-fighting equipment and a first aid box available on site and on all vehicles working on site.
- All waste bins must be kept away from fuel tank installations.
- All fuel tanks must be installed above ground, depending on the volume of stored fuel, for easy detection of fuel leaks.
- Any welding or other sources of heating of materials must be done in a controlled environment, wherever possible and under appropriate supervision, in such a manner as to minimise the risk of veld fires and/or injury to staff.
- Fires lit for comfort (warmth) must be actively discouraged by the Contractor, due to the risk of veld fires and the risk to adjacent properties. Also, no waste material must be burnt.
- Fires for food preparation purposes (e.g. braai) are only allowed in designated areas;
- The process of excavation and back filling must be carried out as a sequential process following one another as quickly as possible. Excavations must only remain open for a minimum period of time and during this time they must be clearly demarcated. If excavations place the public at risk these sites must be fenced.
- The residents directly affected by open trenches must be notified of the dangers. This will be done during the site-specific phase.

9.8. **Waste management**

The Principal Contractor will establish a waste management programme and the various types of bins provided for the various types of waste containers / liners will be colour coded and/ or clearly marked:

- General waste – white;
- Hazardous waste – red;
- Recyclable waste – green;
- Construction and other types of waste – blue.

The following requirements shall be incorporated into the waste management programme:

- Solid Waste:
  - Littering on site and the surrounding areas is prohibited.
  - Clearly marked litterbins must be provided on site. The Contractor must monitor the presence of litter on the work sites as well as the construction campsite.
  - All bins must be cleaned of litter regularly.
  - All waste removed from site must be disposed at a municipal/permitted waste disposal site.
  - Excess concrete, building rubble or other material must be disposed of in areas designated specifically for this purpose and not indiscriminately over the construction site.
  - The entire works area and all construction sites must be swept of all pieces of wire, metal, wood or other material foreign to the natural environment.
  - Contaminated soil must be treated and disposed of at a permitted waste disposal site, or be removed and the area rehabilitated immediately.
  - Waste must be recycled wherever possible.
- Liquid Waste
  - The Principal Contractor must install and maintain mobile toilets at work sites.
  - The Principal Contractor must provide adequate and approved facilities for the storage and recycling of used oil and contaminated hydrocarbons. Such facilities must be designed and sited with the intention of preventing pollution of the surrounding area and environment.

  - All vehicles must be regularly serviced in designated area within the Contractors camp such that they do not drip oil. Where required, vehicles will be serviced in bunded areas and drip trays will be provided.
  - All chemical spills must be contained and cleaned up by the supplier or professional pollution control personnel. Run-off from wash bays must be intercepted.
- Hazardous Waste:
  - No hazardous materials must be disposed of in the veld or anyplace other than a registered landfill for hazardous material. Hazardous waste must be stored in containers with tight lids that must be sealed and must be disposed at an appropriately permitted hazardous waste disposal site. Such containers must not be used for purposes other than those originally designed for.
  - The Principal Contractor must maintain a hazardous material register.

9.9. **Rehabilitation management**

The following requirements for rehabilitation management shall apply:

- When all major construction activities are completed, the site must be inspected to determine site-specific rehabilitation measures. This may be considered as unplanned work e.g. soil rehabilitation due to oil spills.
- All temporary buildings and foundations, equipment, lumber, refuse, surplus materials, waste, construction rubble fencing and other materials foreign to the area must be removed.
- If waste products cannot be recycled they must be disposed of at a permitted landfill site.
- All drainage deficiencies including abandoned pit latrines and waste pits must be corrected.
- Cut and fill areas must be restored and re-shaped.
- The area must be restored to its natural vegetation condition using indigenous trees, shrubs and grasses as directed by a grassland and/or rehabilitation expert.
- Borrow pits must be re-shaped into even slopes and surfaces to blend with the natural terrain and topsoil must be replaced.
- The grass mix, shrubs and trees used for rehabilitation must be compatible with the species identified in the site-specific investigation.
- Areas compacted by vehicles during construction must be scarified to allow penetration of plant roots and the regrowth of natural vegetation.

10 EMERGENCY MANAGEMENT

The Principal Contractor must appoint a competent person to act as emergency controller and/or coordinator.

The Principal Contractor must conduct an emergency identification exercise and establish what emergencies could possibly develop. He must then develop detailed contingency plans and emergency procedures, taking into account any emergency plan that Johannesburg Water SOC Ltd may have in place.

In the event where a contractor incorporates the services of a 3rd party service provider for the provision of Emergency Response Services, the following criteria must be met:

- Identification of 3rd party emergency response services (organization & contact details);
- Notification of contractor to 3rd party emergency response service of incorporation of services into contractor's emergency response plan (written agreement / signed letter).

The Principal Contractor and the other contractors must hold regular practice drills of contingency plans and emergency procedures to test them and familiarise employees with them.

First-aid

The Principal Contractor must provide first-aid equipment (including a stretcher) and have qualified first-aider(s) on site as required by General Safety Regulations promulgated in terms of the Occupational Health and Safety Act (Act no. 85 of 1993).

The contingency plan of the Principal Contractor must include arrangements for the speedy and timeous transporting of injured and/or ill person(s) to a medical facility or of getting emergency medical aid to person(s) who may require it.

The Principal Contractor must have written arrangements in place with his other contractors regarding the responsibility of the other contractors towards their own injured and/or ill employees.

11 SHE TRAINING

All employees in jobs requiring training in terms of the Occupational Health and Safety Act (Act no 85 of 1993) and any other applicable legislative requirements are to be in possession of valid proof of training. Other occupational health, safety and environmental training requirements of the Occupational Health and Safety Act (Act no 85 of 1993) and Construction Regulations can include:

- General induction;
- Site and job specific induction, including visitors;
- Occupational health and safety representatives;
- Training of the legal and nominated appointees;
- Operators and drivers of construction vehicles and mobile plant;
- Basic fire prevention and protection;
- Basic first-aid;
- Storekeeping methods and safe stacking; and
- Emergency planning and coordination
- Incident investigation
- Risk Assessment
- Planned job observations (supervisors)

All operators, drivers and users of construction vehicles, mobile plant and other equipment are to be in possession of valid proof of training and, where applicable, valid licenses.

12.1 General Job training

The contractor is required to ensure that before an employee commences work their direct supervisor or line manager who is responsible for the employee has informed the employees of his scope of authority, hazards and risks associated with the work to be performed as well as the safety control measure(s). This will involve discussion in connection with ay work standard, job description or company policy or procedure.

12.2 Awareness and promotion

The Principal Contractor is required to have a promotion and awareness programme in place to create an occupational health and safety culture within employees. The following are some of the methods that may be used:

- Toolbox talks;
- Posters;
- Videos;
- Competitions;
- Suggestion schemes;
- Participative employee activities such as “occupational health and safety circles”.

The Principal Contractor is, at a minimum, required to provide awareness programmes to employees on the following:

- General Health and Safety Awareness

- Environmental Awareness;
- HIV / AIDS awareness.

12.3 General competence requirement

The Principal Contractor shall ensure that his personnel and other contractors' personnel are trained and competent to carry out work safely and without risk to health has been completed before work commences. The Principal Contractor shall ensure that follow-up and refresher training is conducted as the work progresses and whenever the scope or nature of the work changes.

A "**competent person**" in relation to construction work, means any person having the knowledge, training and experience specific to the work or task being performed: Provided that where appropriate qualifications and training are registered in terms of the provisions of the South African Qualifications Authority Act, 1995 (Act No. 58 of 1995), these qualifications and training shall be deemed to be the required qualifications and training. It is the responsibility of the Contractor to determine whether any appropriate qualifications and training are registered in terms of the provisions of the South African Qualifications Authority Act.

Records of all training must be kept in the SHE File. The contents of the file will be audited from time to time.

At a minimum, the Principal Contractor will provide training on Safe Work Procedures / Safe Operating Standards to personnel responsible for performing the related task. Records of training on Safe Work Procedures / Safe Operating Standards will be retained. Competence and skill levels by the employees responsible for performing the task on the implementation of the Safe Work Procedures / Safe Operating Standards will be measured through Planned Job Observations.

12.4 Site-specific induction training

The Principal Contractor will be required to develop a project specific induction-training course based on the baseline risk assessment for the contract work. He will ensure that all his employees and other contractors and their employees have received training on the submitted induction-training programme.

All employees of the principal and other contractors are to be in possession of proof (on person) that they have attended a site-specific occupational health and safety induction-training course.

No contractor shall allow or permit any employee, visitor or any other person to enter the site, unless such employee or person has undergone health, safety and environmental induction training pertaining to the hazards prevalent on the site at the time of entry.

Where the Principal Contractor is required to operate within Johannesburg Water SOC Ltd Depot's the Principal Contractor will ensure that all employees undergo the Johannesburg Water SOC Ltd induction.

12 PPE REQUIREMENTS

- The Principal Contractor is required to continuously identify the hazards in the workplace and deal with them. He must either remove them or, where impracticable take steps to protect workers and make it possible for them to work safely and without risk to health under the hazardous conditions.
- The Principal Contractor will establish a Personal Protective Equipment Policy and a Personal Protective Equipment study will be conducted to determine the types of Personal Protective Equipment (PPE) to be supplied related to the hazards and risks emanating from the tasks.
- Cognisance shall be given to the gender of individuals required to where PPE; size required by the employee and size issued.

- Personal protective equipment should, however, be the last resort and there should always first be an attempt to apply engineering and other solutions to mitigating hazardous situations before the issuing of personal protective equipment is considered.
- Where it is not possible to create an absolutely safe and healthy workplace the Principal Contractor is required to inform employees regarding this and issue, free of charge, suitable equipment to protect them from any hazards being present and that allows them to work safely and without risk to health in the hazardous environment.
- It is a further requirement that the Principal Contractor maintains the equipment, instructs and trains the employees in the use of the equipment and ensures that the employees use the prescribed equipment.
- Employees do not have the right to refuse to use and/or wear the equipment prescribed by the employer and, if it is impossible for an employee to use or wear the prescribed protective equipment through health or any other reason, the employee cannot be allowed to continue working under the hazardous condition(s) for which the equipment was prescribed. An alternative solution has to be found that may include relocating the employee.
- The Principal Contractor may not charge any fee for protective equipment prescribed by him but may charge for equipment under the following conditions:
  - Where the employee requests additional issue in excess of what is prescribed;
  - Where the employee has patently abused or neglected the equipment leading to early failure; and
  - Where the employee has lost the equipment.

All employees shall, as a minimum, be required to wear the following personal protective equipment on any of Johannesburg Water SOC Ltd's projects:

- Protective overalls;
- Protective footwear;
- Protective headwear; and
- Eye, face and ear protection.
- NO SHORTS OR DRESSES WILL BE ALLOWED ON SITE!!!

All Personal Protective Equipment will clearly display the branding components of the Principal Contractor's organization (e.g. Name of Organization, logo).

13 DISCIPLINARY PROCESSES

- The contractor is required to implement disciplinary process in order to enforce compliance with requirements.
- All sub-contractors are required to have the same.

14 SITE RULES

- The Principal Contractor must develop a set of site-specific OH&S rules that will be applied to regulate the Health and Safety Plan and associated aspects of the construction.
- When required for a site by law, visitors and non-employees upon entering the site shall be issued with the proper Personal Protective Equipment (PPE) as and when necessary**.**

15 PUBLIC HEALTH AND SAFETY

The Principal Contractor is responsible for ensuring that non-employees affected by the construction work are made aware of the dangers likely to arise from the construction work as well as the precautionary measures to be observed to avoid or minimise those dangers. This includes:

- Non- employees entering the site for whatever reason;
- The surrounding community; and
- Passers-by the site.

- The Principal Contractor shall organize the site in such a manner that pedestrians and vehicles can move safely and without risks to health, including sufficient and suitable traffic routes and safe walkways with relevant signage.
- Appropriate signage must be posted to this effect and all employees on site must be instructed to ensure that non-employees are protected at all times.
- All non-employees entering the site must receive induction into the hazards and risks of the site and the control measures to be observed.
- The Principal Contractor shall recognize that the Community Liaison Officer (CLO) is the link between Johannesburg Water SOC Ltd and the community and provide all reasonable support to the Community Liaison Officer to ensure relevant responsibilities are fulfilled and positive relationships with the community are maintained.
- Where activities are performed close to public routes, the Principal Contractor will establish a traffic management plan incorporating the requirements of relevant by-laws. At a minimum, barricading, warning signage and flagmen will be provided to ensure the protection of workers from vehicles in transit. Where required, the Principal Contractor will interact with the local traffic department to establish minimum requirements to be implemented on public routes.

16 REFUSAL TO WORK

- Section 14 of the OHS Act states that employees shall carry out any lawful orders given to them, suggesting that they have the right to refuse to obey any unlawful order or work instruction.
- In terms of legal and JW requirements, if an employee has reasonable belief that the work to be carried out is likely to endanger themselves or other persons in any way, he/she has the right to refuse to work.
- An employee may also refuse to work in term of Section 29 of NEMA, if the work would result in imminent and serious threat to the environment.
- All contractors shall ensure that their employees are conversant with hazards associated with their work and work environment, and be aware of the precautionary measures to take.
- The contractor must ensure that all refusals to work are investigated promptly and resolved timeously.

17 SECURITY

The Principal Contractor must establish site access rules and implement and maintain these throughout the construction period. Access control must, amongst other, include the rule that non-employees will not be allowed on site unaccompanied.

The Principal Contractor must develop a set of security rules and procedures and maintain these throughout the construction period.

The Principal Contractor shall:

- Provide a guardhouse for security personnel. The guardhouse should be in good condition and at-least meet minimum requirements as per Environmental Regulations for Workplaces as promulgated under the Occupational Health and Safety Act (Act no. 85 of 1993).
- Supply an access card containing the name, surname, employee number and photograph for all appointed employees (full or part time) for the site.

- Ensure that no person enters the construction site without wearing the necessary Personal Protective Equipment (PPE).
- Ensure that no children are allowed on the construction site.
- Ensure that no family members are sleeping over on the construction site.
- Ensure that no pets are allowed on the construction site.

18 ACCOMMODATION ON SITE

No employees shall be accommodated on site.

19 WELFARE FACILITIES

The provision of toilets for each sex is required in terms of the National Building Regulations and Construction Regulation 28. Chemical toilets are allowed instead of the water borne sewerage type. Toilets have to be provided at a ratio of 1 toilet per 30 workers. The Principal Contractor shall provide flushing toilets on the construction premises.

- At least cold-water showers for each sex have to be provided at a ratio of 1 shower per 15 workers.
- Some form of screened off changing facility must be provided separately for each sex.
- Some form of eating facility sheltered from the sun, wind and rain must be provided.

The employer needs to provide his employees with the following:

- Potable water for drinking;
- Water and soap for hand washing
- Toilet paper

20 COMPLIANCE MONITORING

20.1 Inspections

- Contractors will be inspected at least once per week by the JW Project Inspectors.
- Feedback of the inspections will be issued immediately on work instructions, and a formal report sent within 7 days of conducting the inspection to all relevant stakeholders.
- Johannesburg Water SOC Ltd. reserves the right to conduct other ad-hoc assessments and inspections as deemed necessary.
- This may include, amongst other measures, site safety walks. Corrective actions will be identified by Johannesburg Water SOC Ltd. and the Principal Contractor's representative and implemented by the Principal Contractor (at no cost to Johannesburg Water SOC Ltd.) to ensure SHE Performance improvement.

20.2 Monthly audits

- Monthly audits will be conducted within periods not exceeding 30 days.
- The Principal Contractor is to conduct his own monthly internal audits and inspections to verify compliance with his own occupational health and safety plan and management system as well as compliance with the requirements of the Johannesburg Water SOC Ltd. SHE Specification.

- The Principal Contractor will also assess and inspect the compliance of other contractors under its control. Management members of the Principal Contractor will be involved in the internal assessments and inspections.

20.2.1 Monthly compliance rating

A monthly compliance rating will be calculated for each Principal Contractor as per a formula determined by Johannesburg Water SOC Ltd focussing on or incorporating outcomes of assurance (e.g. monthly audit), operational (e.g. behavioural based safety inspection) assessments and other requirements, as necessary. Johannesburg Water SOC Ltd reserves the right to adjust the monthly compliance calculation formula as and when required – each revision of the monthly compliance calculation formula will be communicated to the Principal Contractor before implementation.

Each Principal Contractor is required to maintain a minimum compliance rating of 93% (Ninety Three Percent).

Scoring	Classification	Classification description
93% -100%	Good	Substantial compliance
80% -92%	Average	Compliance status needs to be improved
60% - 79%	Poor	Methods to ensure compliance require substantial improvement - operations with substantial non-compliance risks
<60%	Very poor	Methods to ensure compliance failed completely - troubled operation with severe non-compliance risks

20.3 Work stoppages

Work stoppages will be identified for 2 (two) types of work stoppages to be implemented:

- Overall work stoppage – the Principal Contractor and its Contractors are not allowed to continue with any type of construction / site work up until the work stoppage has been closed-out;
- Activity work stoppage – The Principal Contractor and its Contractors are not allowed to continue with the specific activity / task / job up until the work stoppage has been closed-out.

Overall work stoppages will be issued where non-conformances are identified against the criteria in the following table.

NR	DESCRIPTION OF AUDIT NON-CONFORMANCE / NON-COMPLIANCE
1	NOTIFICATION OF CONSTRUCTION WORK
1.1	Local Department of Labour not notified of construction work before commencement of construction activities
1.2	Notification of construction work not stamped by local Department of Labour (no fax copies)
1.3	Copy of notification of construction work not available on site
2	PROOF OF REGISTRATION WITH COMPENSATION COMMISSIONER

NR	DESCRIPTION OF AUDIT NON-CONFORMANCE / NON-COMPLIANCE
2.1	Proof of registration with Compensation Commissioner or other insurer not available
2.2	Registration with Compensation Commissioner or other insurer not valid and up-to-date
3	POLICY COMMITMENT & SHE SPECIFICATION
3.1	SHE Plan not compiled, approved by contractor management and available on site
4	SECTION 37(2) AGREEMENT
4.1	Signed section 37(2) Agreement not signed and available on site
5	RISK ASSESSMENTS
5.1	Risk assessments not developed/ not applicable to scope of work issued by Client
6	CONSTRUCTION MANAGER
6.1	No construction manager appointed / on site
6.2	Proof of competency not available on-site
7	SITE SAFETY OFFICER
7.1	Site safety officer not appointed specifically for site where construction activities are performed
8	SHE FILE
8.1	No file on site

Activity work stoppages will be issued where non-conformance are identified per activity where the health and safety of employees or the public is compromised.

20.4 Non-compliance management process

The following actions will be instituted where non-conformances are identified in terms of compliance to relevant legislative requirements and the Johannesburg Water SOC Ltd SHE Specification.

CRITERIA	ACTION TO BE INSTITUTED	RESPONSIBLE PARTY
Compliance rating: 93-100%	Non-conformance closure	Principal Contractor / Contractor
Compliance rating: 80-92%	Letter of compliance improvement to Principal Contractor	Johannesburg Water SOC Ltd
	Non-conformance closure	Principal Contractor / Contractor
Compliance rating: 60-79%	Non-compliance hearing	Johannesburg Water SOC Ltd
	Letter of commitment for performance improvement	Principal Contractor / Contractor
	Non-conformance closure	Principal Contractor / Contractor
Compliance rating: <60%	Non-compliance hearing	Johannesburg Water SOC Ltd

CRITERIA	ACTION TO BE INSTITUTED	RESPONSIBLE PARTY
	Letter of commitment for performance improvement	Principal Contractor / Contractor
	Non-conformance closure	Principal Contractor / Contractor
	Supply Chain Management to be informed of non-compliance standing	Johannesburg Water SOC Ltd
3 x Work stoppages	Non-compliance hearing	Johannesburg Water SOC Ltd
	Letter of commitment for performance improvement	Principal Contractor / Contractor
	Non-conformance closure	Principal Contractor / Contractor
	Supply Chain Management to be informed of non-compliance standing	Johannesburg Water SOC Ltd
3 x Non-conformance to <93% monthly compliance rating	Non-compliance hearing	Johannesburg Water SOC Ltd
	Letter of commitment for performance improvement	Principal Contractor / Contractor
	Non-conformance closure	Principal Contractor / Contractor
	Supply Chain Management to be informed of non-compliance standing	Johannesburg Water SOC Ltd
3 x consecutive repeat findings	Non-compliance hearing	Johannesburg Water SOC Ltd
	Letter of commitment for performance improvement	Principal Contractor / Contractor
	Non-conformance closure	Principal Contractor / Contractor
	Escalation to SCMU & CAPEX	Johannesburg Water SOC Ltd

21 OPERATIONAL REQUIREMENTS

21.1 EXCAVATIONS

- Where excavations will exceed 1.5 m in depth the contractor will be required to submit a method statement to Johannesburg Water SOC Ltd for approval before commencing with the excavation and Johannesburg Water SOC Ltd will issue a permit to proceed once the risk assessment and method statement is approved.
- Excavations must be limited to 100m per day, or equated to the amount of work to be done for the day.
- All open excavations shall be closed within 3 days of excavation. No excavation will remain open beyond 3 days or during holidays.
- Excavation work must be carried out under the supervision of a competent person, who has been appointed in writing, with at least two years' experience in excavation work. Before excavation work begins the stability of the ground must be evaluated.
- Whilst excavation work is being performed, the contractor must take suitable and sufficient steps to prevent any person from being buried or trapped by a fall or dislodgement of material.
- No person may be required or permitted to work in an excavation that has not been adequately shored or braced.

- Where the excavation is in stable material and where the sides of the excavation are sloped back to at least the angle of repose of the excavated material, shoring or bracing may be left out but only after written permission has been obtained from the appointed competent person.
- Shoring and bracing must be designed and constructed to safely support the sides of the excavation.
- Where uncertainty exists regarding the stability of the soil the opinion of a competent professional engineer or professional technologist must be obtained whose opinion will be decisive. The opinion must be in writing and signed by the engineer or technologist as well as the appointed competent person.
- No load or material may be placed near the edge of an excavation unless suitable shoring has been installed to be able to carry the additional load.
- Neighbouring/adjoining buildings, structures or roads that may be affected or endangered by the excavation must be suitably protected.
- Every excavation must be provided with means of access that must be within 6 metres of any worker within the excavation.
- The location and nature of any existing services such as water, electricity, gas etc. must be established before any excavation is commenced with and any service that may be affected by the excavation must be protected and made safe for workers in the excavation.
- The appointed competent person must inspect every excavation, including the shoring and bracing or any other method to prevent collapse, as follows:
    - Daily before work commences
    - After every blasting operation
    - After an unexpected collapse of the excavation
    - After substantial damage to any supports
    - After rain
- The results of any inspections must be recorded in a register kept on site and in the safety file.
- Every excavation accessible to the public or that is adjacent to a public road or thoroughfare or that threatens the safety of persons, must be adequately barricaded or fenced to at least one meter high and as close to the excavation as practicable, regardless of the depth of the excavation.
- Every excavation must be provided with warning lights or visible boundary indicators after dark or when visibility is poor.
- Upon entering an excavation the requirements of General Safety Regulation 5, work in confined spaces, must be observed:
- Any confined space may only be entered after the air quality has been tested to ensure that it is safe to breathe and does not contain any flammable or noxious air mixture.
- The confined space must be purged and ventilated of any hazardous or flammable gas, vapour, dust or fumes.
- The safe atmosphere must be maintained and, where necessary.
- Employees are to be provided with breathing apparatus and must wear a safety harness with a rope with the free end of the rope being continuously attended to by a person outside the confined space.
- Furthermore, an additional person, trained in resuscitation, to be in full-time attendance immediately outside the confined space.
- Additional serviceable breathing and rescue apparatus is kept immediately outside the confined space for rescue purposes.
- All pipes, ducts etc. that may leak into the confined space to be blanked off sufficiently to prevent any leakage or seepage.
- The employer must ensure that all employees have left the confined space after the completion of work.

- Where flammable gas is present in a confined space no work may be performed in close proximity to the flammable atmosphere.
- Excavations and other openings must be provided with sufficient barriers to prevent construction vehicles and mobile plant from falling into them.
- Excavations left open for extended periods of time (exceeding 48 hours) must be approved the relevant Engineer / Construction Supervisor.

21.2 CONFINED SPACE ENTRY

- Enclosed space work necessitates a Confined Space Permit. This may only be obtained from the authorized person nominated in writing.
- The responsibility for safe procedure, both at the time of entry and during the entire operation of entering and working in confined spaces, rests with the Contractor.
- The Contractor shall be sure that adequate steps have been taken to eliminate or control hazards.
- Before working in an area that contains dust, the area is to be ventilated and hosed down to settle and dampen the dust.
- The Contractor shall provide all necessary equipment to manage confined spaces, including all necessary monitoring and rescue equipment (such as tripods, breathing equipment and the like).
- The Contractor shall ensure all persons working in a confined space or managing entry to a confined space are appropriately trained.
- Compulsory - Continuous monitoring, trained rescue teams, radio communication & adequate ventilation.

Pump sumps & valve chambers

Ventilation

- All available manholes or ventilation covers must be removed and the compartment ventilated for 10 (ten) to 15 (fifteen) minutes, using compressed air or a portable blower.
- Such ventilation must be continued while personnel are in the compartment.
- Ensure that exhaust fumes from blower do not enter the confined space.
- Before entering any sump or compartment, the atmosphere must be tested by the Principal Contractor's competent person (trained by the supplier of the gas monitoring equipment) by lowering the gas monitoring equipment to the bottom of the sump or compartment by means of a rope.
- A register must be kept indicating that the atmosphere has been tested and that the sump or compartment is fit to work in.
- The Principal Contractor's construction supervisor must check and co-sign this register each time he visits a site to ensure that the atmosphere is continuously being monitored.

Entering sump

- When entering a sump the person entering the sump must wear the safety harness, gas detector as well as a self-rescuer.
- A lifeline must be attached to the safety harness and a person on the surface must be in continuous contact with the person in the sump.
- At least one person on the surface must be trained in basic first aid and CPR and a first aid kit with resuscitation equipment must be available outside the entrance of the confined space for emergencies.
- Should the alarm sound when a person is in the confined space, the area must be evacuated immediately and the atmosphere re-tested and certified safe before re-entry into the confined space.
- In no circumstance shall any person remain within a sump for a period of more than one hour at a time.
- A five-minute rest on the surface must be taken after this period before re-entering.
- No naked lights, smoking or unprotected electrical apparatus which may cause sparks, shall be permitted in any sump or in their vicinity.

Underground tanks, digesters

Lock-out

- The electrical switch must be locked out in the MCC room when emptying and filling a digester.
- No work shall be done in any digester or closed tank without the necessary permit issued by the Maintenance Manager of the facility.
- The Principal Contractor's construction supervisor must check and co-sign the permit.

Ventilation

- All available manhole or ventilation covers, and in the case of a digester, the "Varig" (pressure relief) valve must be removed and the compartment force ventilated for at least 4 (four) hours.
- Such ventilation must be continued while there are people in the confined space.
- Before entering the confined space, the atmosphere must be tested by lowering the gas monitoring equipment to the bottom of the confined space by means of a rope.
- The compartment may only be entered if it has been certified safe by a competent person (certified competent by supplier of gas monitoring equipment).
- The first person to enter the confined space must wear the gas monitoring equipment on his person while inside the confined space.
- A person trained in the use thereof, inside the digester, must also wear an emergency oxygen kit. Another emergency oxygen kit must be available on the surface.
- No person may enter any digester or closed tank unaccompanied and at least two other persons must be present on the surface to make continuous contact with the persons in the confined space.

Entering closed tank or digester

- The first person to enter a closed tank or digester must wear a safety harness with a safety rope, long enough to reach the point of exit.
- This safety rope must be monitored at all times.
- All persons subsequently entering the closed tank/digester must wear a safety harness as well as a self-rescuer.
- No person is allowed to enter the tank or digester without a safety harness or self-rescuer.
- In no circumstances shall any person remain within the enclosure for a period of more than one hour at a time.
- A fifteen-minute rest on the surface must be taken before re-entry,
- No naked lights, smoking or unprotected electrical apparatus which may cause sparks shall be permitted in any confined space or in their vicinity.

Confined spaces & water chambers

General

- All employees working in confined spaces or sewer manholes must be issued with gas monitoring equipment and safety harnesses and self- rescuers where applicable.
- All these employees must be trained in their use.
- Where over pumping between manholes is involved, only leakage free pumping machines and conveyance tubes will be allowed.
- Under no circumstances may any confined space be entered unless it has been certified safe to work in.
- Safety harnesses and attachments must be checked for damage to webbing, metal fittings and ropes on a monthly basis and the findings recorded in a register.
- Should a harness be damaged, it must be reported to the construction supervisor immediately.

The following records shall be taken and maintained by the Principal Contractor:

- Confined space entry permits
- Confined space entry registers
- Safety harness registers

Ventilation

- All available manholes or ventilation covers must be removed and the chamber ventilated for 10 (ten) to 15 (fifteen) minutes, using compressed air or a portable blower.
- Such ventilation must be continued while personnel are in the chamber.
- Ensure that exhaust fumes from blower do not enter the confined space.
- Before entering any chamber, the atmosphere must be tested by the Principal Contractor's competent person (trained by the supplier of the gas monitoring equipment) by lowering the gas monitoring equipment to the bottom of the chamber by means of a rope.
- A register must be kept indicating that the atmosphere has been tested and that the area is fit to work in.
- The Principal Contractor's construction supervisor must check and co-sign this register every time he visits the site to ensure that the atmosphere is continuously being monitored.
- Fumes must be extracted from the chamber while welding.

Entering chamber

- When entering a chamber the person entering the chamber must wear a safety harness as well as the gas detector.
- A lifeline must be attached to the safety harness and a person on the surface must be in continuous contact with the person in the manhole.
- At least one person on the surface must be trained in basic first aid and CPR and a first aid kit with resuscitation equipment must be available outside the entrance of the confined space for emergencies.
- In no circumstances shall any person remain within a chamber for a period of more than one hour at a time. A five-minute rest on the surface must be taken after this period before re-entering.
- Should the alarm sound when a person is in the confined space, the area must be evacuated immediately and the atmosphere re-tested and certified safe before re-entry into the confined space.
- When the activity to undertake inside the pipeline includes the use of any hazardous chemical substances or substances, which might cause hazardous fumes or gasses the contractor, must comply with 5.24 Hazardous Chemical Substances.

Safety equipment

- All teams must be issued with gas monitoring equipment and safety harnesses and self-rescuers where applicable.
- All employees must be trained in the use thereof.

21.3 BARRICADING

- Barricading plans are to be presented by the Principal Contractor for any major operations involving site works for approval by Johannesburg Water SOC Ltd. Where areas are unsafe, they should be enclosed with barricading. Examples are people working overhead, welding splatter etc.
- Where there is a risk of injury, the area should be barricaded off with secure solid barricades.
- Barricading for the prevention of access into areas with a potential risk of injury shall as a minimum be constructed of a handrail, knee-rail and appropriately supported as to prevent any person from falling into the restricted/risk area.
- Appropriate signage shall be affixed to the barricade indicating the risk associated (i.e. deep excavation, lifting operations etc.) and the responsible Supervisor and contact details shall be displayed. All barricading shall have a "No Entry" signs on all sides and at each change of direction. Signage shall be placed at 20 m intervals where lengths exceed. All signage shall be a minimum size of 290 mm x 290 mm.
- Danger tape shall not be utilised to prevent personnel from entering into areas.
- Where no risk exists of injury to personnel such as stacking and storage areas, the use of wire for hand and knee rails netting shall be acceptable to demarcate the area.
- All barricades will have a dedicated entrance where it is required that personnel enter the areas.

- Appropriate signage shall be placed at the entrance indicating which Contractor has right of entry.
- It is the Contractor's responsibility to remove all redundant barricades directly after use. The Contractor's Safety Officers will maintain a marked-up site plan indicating where barricades are erected.
- It will be a requirement that the contractor protects employees against contact with exposed rebar and poles by the installation of rebar-caps on all exposed areas where there is a potential that an employee could be injured.

21.4 WORKING AT HEIGHTS

- A pre-emptive risk assessment will be required for any work to be carried out above **two metres** from the ground or any floor level. This work will be classified as "work in elevated positions".
- As far as is practicable, any person working in an elevated position will work from a platform, ladder or other device that is at least as safe as if he is working at ground level.
- Whilst working in this position he shall be wearing a single belt with lanyard to prevent the person falling from the platform, ladder or other device.
- This safety belt will be, as far as is possible, secured to a point away from the edge over which the person might fall and the lanyard must be of such a length and strength that the person will not be able to move over the edge.
- Alternatively, any platform, slab, deck or surface forming an edge over which a person may fall may be fitted with suitable guard rails at two different heights as prescribed in the relevant South African National Standard for the design, erection, use and inspection of access scaffolding.
- Where the requirement in the paragraph above is not practicable, the person will be provided with a full body harness that will be worn at all times and shall be attached above the wearer's head at all times.
- The lanyard must be fitted with a shock-absorbing device or the person must be attached to a fall arrest system (anchorage connector; body wear; and connecting device) approved by Johannesburg Water SOC Ltd.
- Where the requirements in the paragraph above are not practicable, a suitable catch net must be erected.
- Employees working in elevated positions must be trained to work without risk to their health and safety or to the health and safety of others and be declared medically and psychologically fit to perform work at elevated positions.
- Where work on roofs is carried out, the risk assessment must take into account the possibility of persons falling through fragile material, i.e. skylights and openings in the roof.
- Access scaffolding must be erected, used and maintained safely in accordance with Construction Regulations and relevant SA Bureau of Standards Code of Practice.
- Detailed consideration must be given to all scaffolding to ensure that it is properly planned to meet the working requirements, designed to carry the necessary loadings and maintained in a sound condition. Sufficient material must be available to erect the scaffolding properly.
- Scaffolding must only be erected, altered or dismantled by persons who have adequate training and experience and are competent in this type of work and under the continuous supervision of such a person.

21.5 SYMBOLIC SIGNGAGE

Contractors shall use mandatory and prescribed symbolic safety signs at their lay down and site areas. The display of the following signs is mandatory:

- "Radio-Active Material" symbolic signs at radioactive storage areas.
- "Eye Protection" symbolic signs shall be displayed at all grinding machines and at any area where it is mandatory to wear eye protection or where there is danger of an eye injury being sustained.
- "Ear Protection" symbolic signs shall be displayed at all areas where there is a danger of noise induced hearing loss being sustained.
- Every separate room of a workplace shall be consecutively numbered.

- All toilets or urinals shall be marked in a conspicuous place with painted or stencilled letters to indicate the sex for which they are intended.
- The location of every first aid box is to be clearly indicated by means of a sign.
- In any room, cabinet or enclosure where flammable substances are used or stored shall be fixed a suitable and conspicuous sign prohibiting smoking or the use of naked flames in the area.
- At the entrance to premises where machinery is used
- Restricted access on “Authorised Person Only” signs on entry. “No person shall enter the workplace or premises without the permission of the employer or user of the machinery”.
- At every place where machinery is used a notice (English & Pictograms) shall be posted.
- Explosive Power Tool shall have a sign warning people when it is in use.
- Electrical Control Gear. A notice shall be posted so as to warn against the re-closing of a switch of control gear whilst a person is working on such equipment.
- Emergency contact telephone numbers.
- Adequate scaffolding signs. (When applicable).
- Adequate fire fighting equipment signs.
- Speed limit signs.
- Warning notices at openings through which people may fall.
- Risk based signage depending on the task being performed e.g.:
    - “Men working above”, “Men working below’, “Road closed – detour”, “Excavation in progress”, “No walkway” etc.;
- No-entry signs to incomplete platforms

The Principal Contractor shall install a notification board indicating the following information at the site entrance:

- Johannesburg Water SOC Ltd project number;
- Principal Contractor identification details (name, telephone number)
- Name and contact details of Construction Supervisor;
- Name and contact details of site safety officer;
- Monthly compliance rating;
- Lost Time Injury Rate;

The Principal Contractor will ensure that information on the notification board is kept up-to-date.

21.6 USE AND STORAGE OF FLAMMABLES

The Principal Contractor to ensure that:

- No person is required or permitted to work in a place where there is the danger of fire or an explosion due to flammable vapours being present unless adequate precautions are taken;
- No flammable material is used or applied e.g. in spray painting, unless in a room or cabinet or other enclosure specially designed and constructed for the purpose unless there is no danger of fire or explosion due to the application of adequate ventilation;
- The workplace is effectively ventilated. Where this cannot be achieved:
    - Employees must wear suitable respiratory equipment
    - No smoking or other source of ignition is allowed in the area
    - The area is conspicuously demarcated as “flammable”
- Flammables stored on a construction site are stored in a well-ventilated, reasonably fire-resistant container, cage or room that is kept locked with access control measures in place. Sufficient fire fighting equipment is installed and fire prevention methods practiced. Proper housekeeping may achieve this;
- Flammables stored in a permanent flammable store are stored so that no fire or explosion is caused.
- Stored in a locked and well-ventilated reasonably fire resistant container, cage or room conspicuously demarcated as “Flammable Store – No Smoking or Naked Lights”
- The flammables store to be constructed of two-hour fire retardant walls and roof and separated from adjoining rooms or workplaces by means of a two-hour fire retardant fire wall

- Adequate and suitable fire fighting equipment installed around the flammables store and marked with the prescribed signs
- All electrical switches and fittings to be of a flameproof design
- Any work done with tools in a flammable store or work areas to be of a non-sparking nature
- No Class A combustibles such as paper, cardboard, wood, plastic, straw and the like to be stored together with flammables
- The flammable store to be designed and constructed such that in the event of spillage of liquids the store is able to contain the full quantity + 10% of the liquids stored
- A sign indicating the capacity of the store to be displayed on the door
- Only one day's quantity of flammable is to be kept in the workplace;
- Containers (including empty containers) to be kept closed to prevent fumes/vapours from escaping and accumulating in low lying areas;
- Metal containers to be bonded to earth whilst decanting to prevent build-up of static forces; and
- Welding and other flammable gases to be stored segregated according to the type of gas and empty and full cylinders.

21.7 HAZARDOUS CHEMICAL SUBSTANCES

The Principal Contractor must ensure that:

- Employees receive the necessary information and training to be able to use and store hazardous chemical substances safely;
- Employees obey lawful instructions regarding:
    - The wearing and use of protective equipment
    - The use and storage of hazardous chemical substances
    - The prevention of the release of hazardous chemical substances
    - The wearing of exposure monitoring and measuring equipment
    - The cleaning up and disposal of materials containing hazardous chemical substances
    - Housekeeping, personal hygiene and the protection of the environment
- The risk assessments required in terms of Construction Regulation include employee exposure to hazardous chemical substances and that the necessary measures be taken to protect persons from being detrimentally affected by hazardous chemical substances present or used in the workplace;
- Suppliers provide the necessary information in the form of a material safety data sheet regarding a hazardous chemical substances required to ensure the safe use and storage of that substances;
- An up-to-date list is kept on site of hazardous chemical substances stored and used together with the material safety data sheet of the hazardous chemical substances;
- Hazardous chemical substances containers be clearly marked with the contents and main hazardous category e.g. "Flammable" or "Corrosive" and the reference number of the hazardous chemical substances on the list indicated above;
- Hazardous chemical substances, for example asbestos dust, are not cleared by using compressed air but should be vacuumed;
- No person eats or drinks in a hazardous chemical substances workplace; and
- Hazardous chemical substances waste is disposed of safely in terms of hazardous waste disposal requirements.
- MSDS's to be in 16 point format- available on site

21.8 FIRE PREVENTION AND PROTECTION

The Principal Contractor must ensure that:

- The risk of fire is avoided;
- Sufficient and suitable storage for flammables is provided;

- Sources of ignition are removed wherever flammable or highly combustible material is present in the workplace, for example:
  - Notices prohibiting smoking are displayed and enforced
  - Welding and flame cutting is only allowed under controlled conditions that includes written hot work permits
  - Only spark-free hand and power tools are used
  - No grinding, cutting and shaping of ferrous metals is allowed using electrically driven power tools that produce sparks
  - Flameproof switches and fittings are to be used in the flammable atmosphere
  - Good housekeeping is maintained to prevent the accumulation of unnecessary combustibles
  - Adequate ventilation is maintained
  - Adequate and suitable fixed and portable fire fighting equipment is provided and maintained in good working order.
- Maintenance must include:
  - Regular inspection of fire equipment by a competent person appointed in writing and keeping a register
  - Annual inspection and service by an accredited service provider
- All employees are instructed in the use of the fire fighting equipment and know how to attempt to extinguish a fire;
- A sufficient number of employees are appointed and trained to act as an emergency team to deal with fires and other emergencies;
- Employees are informed regarding emergency evacuation procedures and escape routes;
- Emergency escape routes are kept clear at all times and clearly marked;
- Evacuation assembly points are demarcated;
- Evacuation is practiced to ensure that all persons are evacuated timeously;
- Roll call is held after evacuation to account for all personnel and ensure that no-one has been left behind; and
- A siren or alarm is fitted which is clearly audible to all persons on site.

21.9 STACKING AND STORAGE

The Principal Contractor must ensure that:

- A competent person is appointed in writing to supervise all stacking and storage on a construction site;
- Adequate storage areas are provided and demarcated;
- The storage areas are kept neat and under control;
- The base of any stack is level and capable of sustaining the weight exerted on it by the stack;
- The items in the lower layers can support the weight exerted by the top layers;
- Cartons and other containers that may become unstable due to wet conditions are kept dry;
- Pallets and containers are in good condition and no material is allowed to spill out;
- The height of any stack does not exceed 3 times the base unless stepped back at least half the depth of a single container at least every fifth tier or the approval of an inspector has been obtained to build the stacks higher with the aid of a machine. The operator of the machine must be protected against items falling from overhead off the stack and no items may overhang;
- The articles that make up a single tier are consistently of the same size, shape and mass;
- Structures for supporting stacks are structurally sound and able to support the mass of the stack;
- No articles are removed from the bottom of the stack first but from the top tier first;
- Anybody climbing onto a stack must do it in a safe manner, taking reasonable safety precautions, and ensuring that the stack is stable and capable of supporting him or her
- Stacks that are in danger of collapsing are broken down and restacked;
- Stability of stacks are not threatened by vehicles or other moving plant and machinery;
- Stacks are built in a header and stretcher fashion and that corners are securely bonded;

- Stacks are stepped back at least half the depth of a single container at least every fifth tier; and
- Persons climbing onto stacks do not approach unguarded moving machinery or electrical installations.
- Laydown area is allocated for Contractor-supplied items.
- At all times, the Contractor shall be responsible for the safe and adequate storage of all materials and equipment on site which he is to install, whether they are supplied by himself or others.
- The safe handling, unloading and loading of material receipts and dispatches at site or storage areas shall be the Contractors' responsibility.

The Contractor shall provide a suitable and adequate lock-up store for the storage of items of equipment and material, which would be damaged or pilfered if stored in the open. The Principal Contractor shall provide all facilities required for weather-proofing, dust proofing or vermin proofing.

The Contractor is responsible for the proper storage and maintenance of all equipment until issue of the Certificate of Practical Completion.

All equipment and materials will be stored on suitable wood poles or pallets which will not protrude more than a meter from any of the stored material. Safe access ways shall be maintained between all stored items preventing employees from having to climb over or under equipment to retrieve the necessary.

21.10 HOUSEKEEPING

The Principal Contractor to ensure that:

- Housekeeping is continuously implemented and maintained;
- Materials and equipment are properly stored;
- Scrap, waste and debris is removed regularly;
- Materials placed for use are placed safely and not allowed to accumulate or cause obstruction to the free-flow of pedestrians and vehicular traffic;
- Waste and debris not to be removed from heights by throwing but rather by chute or crane;
- Where practicable, construction sites are fenced off to prevent entry of unauthorised persons;
- Catch platforms or nets are erected over entry and exit ways or over places where persons are working to prevent them being struck by falling objects;
- An unimpeded work space is maintained for every employee;
- Every workplace is kept clean, orderly and free of tools, materials and the like that are not required for the work being done;
- As far as is practicable, every floor, walkway, stair, passage and gangway is kept in good state of repair, skid-free and free of obstruction, waste and materials;
- The walls and roof of every indoors workplace sound and leak-free; and
- Openings in floors, hatchways, stairways and open sides of floors or buildings are barricaded, fenced, boarded over or provided with protection to prevent persons from falling.

21.11 PUBLIC HEALTH AND SAFETY

The Principal Contractor is responsible for ensuring that non-employees affected by the construction work are made aware of the dangers likely to arise from the construction work as well as the precautionary measures to be observed to avoid or minimise those dangers. This includes:

- Non- employees entering the site for whatever reason;
- The surrounding community; and
- Passers-by the site.

- The Principal Contractor shall organize the site in such a manner that pedestrians and vehicles can move safely and without risks to health, including sufficient and suitable traffic routes and safe walkways with relevant signage.
- Appropriate signage must be posted to this effect and all employees on site must be instructed to ensure that non-employees are protected at all times. All non-employees entering the site must receive induction into the hazards and risks of the site and the control measures to be observed.
- The Principal Contractor shall recognize that the Community Liaison Officer (CLO) is the link between Johannesburg Water SOC Ltd and the community and provide all reasonable support to the Community Liaison Officer to ensure relevant responsibilities are fulfilled and positive relationships with the community are maintained.

21.12 TRAFFIC MANAGEMENT

- Where activities are performed close to public routes, the Principal Contractor will establish a traffic management plan incorporating the requirements of relevant by-laws.
- At a minimum, barricading, warning signage and flagmen will be provided to ensure the protection of workers from vehicles in transit.
- Where required, the Principal Contractor will interact with the local traffic department to establish minimum requirements to be implemented on public routes.

21.13 HAND TOOLS

The Principal Contractor must inspect all hand tools before it is brought onto the site.

- As far as possible all hand tools must be numbered and placed on register to be inspected monthly by a person designated to do so.
- Any tools found to be in an unsafe condition must immediately be removed from service and either discarded or rectified.
- No chisels with “mushroomed” heads must be used.
- No hammer shall be used with a cracked or damaged handle.
- All files must be fitted with handles.
- All trolleys, pushcarts, etc. used on site must be identifiable, placed on register and inspected at least once every month.
- Non-sparking tools must be used in areas where the risk of fire or explosion is present.
- No homemade hand tools are allowed on the project.
- All tools shall be attached to a suitable lanyard when utilised in elevated positions

21.14 PORTABLE ELECTRICAL EQUIPMENT

Portable electrical tools and equipment includes every unit that takes electrical power from a 15 ampere plug point and is moved around for use in the workplace for example; drills, saws, grindstones, portable lights, etcetera. Other electrical appliances such as fridges, hotplates, heaters, and etcetera must be inspected and maintained to the same standards as portable electrical tools and appliances.

The use, inspection and maintenance of portable electrical tools and equipment shall be as follows:

- Periodical inspections must be carried out by a competent person appointed in writing;
- Inspection results must be recorded in a register;
- Only competent authorised persons are allowed to use portable electrical tools and equipment; and
- The correct protective equipment must be worn or used whilst operating portable electrical tools and equipment.

This equipment:

- Must be maintained in good condition at all times to prevent an electrical shock to the user;
- The main power source should incorporate an earth leakage protection device or receive power through a double wound transformer or be double insulated and clearly marked as such; and
- All equipment must be fitted with a switch to allow for safe and easy starting and stopping.

The following requirements apply to portable lights:

- Must be fitted with a robust non-hygroscopic non-conducting handle;
- Live metal parts or parts which may become live must be protected against contact;
- The lamp must be protected by a strong guard;
- The cable lead-in must withstand rough handling;
- Inspections must be undertaken that concentrate on plug, cord, switch and any obvious faults;
- A register be kept for each piece of equipment with findings of regular inspections undertaken to evaluate the condition of these lights; and
- When used in wet/damp/metal container conditions, the lamp must be protected.

21.15 LIFTING EQUIPMENT & MACHINERY

Lifting equipment must be designed and constructed in accordance with the manufactures/designers specifications as well as generally accepted technical standards and operated, used, inspected and maintained in accordance with the manufactures requirements as well as that of the of Driven Machinery Regulations promulgated in terms of the Occupational Health and Safety Act (Act no 85 of 1993).

The Driven Machinery Regulations requires that:

- Lifting equipment is clearly and conspicuously marked with the maximum mass load (MML) that it is designed to carry safely. When the MML varies with the conditions of use a table showing the maximum mass load with respect to every variable condition shall be posted up by the user in a conspicuous, place easily visible to the operator and the table shall be used by the driver/operator;
- Each winch on a lifting machine must at all times have, at least, three full turns of rope on the drum when the winch has been run to its lowest limit;
- Lifting equipment shall be fitted with a brake or other device capable of holding the MML. This brake or device shall automatically prevent the downward movement of the load when the lifting power is interrupted;
- Lifting equipment shall be fitted with a load limiting device that automatically arrest the lift when the load reaches its highest safe position or when the mass of the load is greater than the MML;
- Every chain or rope on a lifting machine that forms an integral part of the machine must have a factor of safety as prescribed by the manufacturer of the machine. Where no standard is available the factor of safety must be:
    - chains – 4 (four)
    - steel wire ropes 5 (five)
    - fibre ropes- 10 (ten)
- Every hook or load attaching device must be designed to prevent the load from slipping off or disconnecting;
- Every lifting machine must be inspected and load tested by a competent person every time it has been dismantled and re-erected and every 12 months after that. The load test must be in accordance with the manufacturer's requirements or to 110% of the MML. In addition, all ropes, chains, hooks or other attaching devices, sheaves, brakes and safety devices forming an integral part of a lifting machine must be inspected every 6 months by a competent person;
- All maintenance, repairs, alterations and inspection results must be recorded in a log book and each lifting machine must have its own log book; and
- No person may be lifted by a lifting machine not designed for lifting persons unless in a cradle approved by the inspector of the Department of Labour.

General requirements for cranes and lifting equipment

All documentation must be provided to the Johannesburg Water SOC Ltd Project Engineer prior to mobilisation. Failure to do so and the resulting cost of any delays and/or remedial activities will be for the Contractor's account.

All crane operators must be authorised by the relevant Engineer before they may operate a crane or lifting machine. The Load charts must be displayed at the crane.

Daily pre-use inspections of the cranes must be done and be kept on the file. The inspections must be logged in a logbook. The area in which a lift is performed must always be barricaded to prevent employees from entering.

A crane or lifting machine must not be left unattended and the keys may never be left in the ignition when the operator is not present. Properly constructed out rigger pads must be used when soil is uneven or unstable. (Only sleepers or appropriately designed steel plate pads may be used for this purpose).

Only a competent rigger may direct a lift of any kind unless the following requirements are met. Rigger assistants used for performing lifting operations shall be limited to lifts with all of the following requirements:

- Lifts lower than 5 tons
- Easy lifts that does not require the load to be lifted over structures, equipment or machinery
- Equipment that is not critical
- Rigging configuration that requires the attachment of several parts of lifting equipment such as chain blocks to adjust the angle of loads.
- All safety devices on a crane or lifting machine must be functional.

Certification will be required for record purpose, and shall cover the following:

- A Brake or other device capable of holding the maximum mass should the power fail, or which is such that it shall automatically prevent the uncontrolled downward movement of the load when the raising effort is interrupted; and
- A Limiting device which shall automatically arrest the driving effort when:
- The Hook or Load attachment point of the Power Driven lifting machine reaches its highest safe position; and
- In the case of a Winch Operated lifting machine with a lifting capacity of 5000kg or more, the load is greater than the rated mass load of such machine.

The user shall ensure that every lifting machine is operated by an Operator specifically trained for a particular type of lifting machine; the user shall not require or permit a person to operate such lifting machine unless the operator is in possession of a certificate of training, issued by an accredited person or organisation.

No Crane shall be used at arrival on site before copies of all documentation have been handed over to the Johannesburg Water SOC Ltd and the Crane have been checked by a person duly authorised and signed off as acceptable. Copies of all documentation shall be kept in the SHE File at all times.

No Crane shall be used without a pre-use check and findings entered on an approved checklist. Before any cranes are established on site the following must be inspected and approved:

- Operator's licences
- Training certificates
- Medical fitness certificate.
- The cranes load test certificate.
- Rope test certificates including Mill / Destructive test.
- The lifting gear load test certificates.
- The load limiting device calibration certificate.
- Proof that the hooks have been measured for spreading.

- The service inspection history.
- Monthly comprehensive inspection certificate
- Operation and maintenance Manuals and crane condition.

Cranes and Lifting Machines

A contractor shall ensure that where tower cranes are used:

- Account is taken of the effects of wind forces on the structure;
- Account is taken of the bearing capacity of the ground on which the tower crane is to stand;
- The bases for the tower cranes and tracks for rail-mounted tower cranes are firm and level;
- The tower cranes are erected at a safe distance from excavations;
- There is sufficient clear space available for erection, operation and dismantling;
- The tower crane operators are competent to carry out the work safely; and
- The tower crane operators are physically and psychologically fit to work in such an environment by being in possession of a medical certificate of fitness."

No user shall use or permit any person to use a Jib-Crane with a lifting capacity of 5000kg or more at a minimum Jib radius, unless it is provided with:

- A load indicator that shall indicate to the operator of the Jib-Crane the mass of the load being lifted, provided that such a device shall not require manual adjustment from the application of the load, to the Jib-Crane, until the release of the load.
- A Limiting Device, which shall automatically arrest the driving effort whenever the load is lifted, is greater than the rated mass load of the Jib-Crane.

Mobile Crane near Power Lines

No mobile cranes are to be used near overhead power lines until the Johannesburg Water SOC Ltd representative has been notified and provided safe access conditions and a valid permit to work is obtained. Mobile cranes shall be effectively earthed when working in the vicinity of electrical wires. Assume that all electrical equipment and wires are live and avoid them.

Skyjacks

The following requirements for skyjacks shall apply:

- No Skyjack shall be used before the Jack has been inspected and passed by the Resident Engineer.
- The Test Certificate, no older than three (3) months shall be produced.
- The Safe Working Load shall be clearly displayed.
- The Operators shall make use of Safety belts / Harnesses at all times.
- Only trained, competent and appointed persons shall operate Skyjacks.
- Proof of Training and Training program shall be submitted.
- No person shall stand of the Handrails of a Skyjack.
- When a Skyjack is not operational, it shall be stopped, no lower than three (3) meters above ground level.
- The Operator shall make use of a ladder to get in and out of the Skyjack. The ladder shall be removed to safekeeping when stopped and not in use.
- The Power supply shall be disconnected when not in use thus preventing unauthorised

Overhead Cranes

Contractors and their employees shall not go onto any operational overhead crane runway or crane for any purpose without a valid permit to work.

When ascending to, or descending from, crane runways, always use the access provided for this purpose.

When crane runways are operational, prior to the commencement of any work being carried out on or near a crane runway, or in circumstances as necessary, the Principal Contractor shall arrange to isolate appropriate sections of the crane runway by fitting stops to the crane rail tracks.

If this is impracticable, the Principal Contractor shall provide a watcher who shall take up a position in the crane cab. In cases where there is more than one crane on the same runway, a watcher is to be provided in the cab of each crane, which may approach the work area. The Contractor shall note that the use of a crane watcher is not permitted for repairs or replacements of the crane rails.

The prime responsibility of the watcher is to keep the employee, who may be in or move into a position of danger, constantly in view and warn the crane driver when necessary. It is important that watchers are given clear and concise instructions in carrying out their responsibilities so as to ensure maximum safety.

The watcher shall not engage in conversation with the driver.
In cases where the watcher stationed in the crane cab is unable at all times to view employees working on the runway, a second watcher shall be placed in a position where there is a clear vision of both the employees working on the crane runway and the watcher in the crane cabin.

When sections of runway are being replaced or repaired, arrangements shall be made to isolate the working position by fitting permanent rail stops to the crane rail tracks. If necessary, they are to be fitted on both sides of the section under repair. When the stops are fitted, they shall be at least three (3) metres clear of the area under repair.

When rail stops are fitted for this purpose, members of the group or groups working on the crane runway shall fix Danger Tags to the stops.

The Contractor shall provide the watcher with a hooter or suitable warning device.

Lifting tackle
The following requirements will apply to lifting tackle:

- Manufactured of sound material, well-constructed and free from patent defects;
- Clearly and conspicuously marked with an identity number;
- MML factor of safety:
    - Natural fibre ropes - 10(ten)
    - Man-made fibre ropes and woven webbing - 06(six)
    - Steel wire ropes – single rope - 06(six)
    - Steel wire ropes – combination slings - 08(eight)
    - Mild Steel chains - 05(five)
    - High tensile/alloy steel chains - 04(four)
- Steel wire ropes must be examined by a competent person every three months and the results recorded in a designated logbook. The ropes must be discarded (not used any further for lifting purposes) when wear and corrosion is evident.

21.16 LADDERS

The following requirements for ladders will apply:

- All ladders used on the site shall be constructed and used in compliance with the OH&S Act and Regulations.
- Ladders, which provide access to a working platform, shall extend one metre above the platform where it provides access, and shall be secured to prevent slipping.
- Timber ladders shall not be painted other than with clear preserving oils, clear varnishes or clear plastics.

- Ladders, which are in a damaged condition, shall not be used and shall be labelled accordingly and removed from the Premises.
- All Ladders shall be numbered, logged in a register, and inspected monthly.
- A ladder in use shall be held by an assistant and/or properly tied down in position.
- Only ladders that do not conduct electricity shall be used in live electrical sub-stations and switching rooms.
- Ladders shall be removed after use and stored in an appropriate facility as to not expose them unnecessarily to the elements or potential damage by surrounding activities.

21.17 CONSTRUCTION VEHICLES AND MOBILE PLANT

Johannesburg Water SOC Ltd will inspect construction vehicles and mobile plant prior to being allowed on a project site. Suppliers of hired vehicles, plant and equipment will be required to comply with this specification as well as the Occupational Health and Safety Act (Act no. 85 of 1993) and Regulations.

Construction vehicles and mobile plant to be:

- Of acceptable design and construction;
- Maintained in good working order;
- Used in accordance with their design and intention for which they were designed;
- Operated and/or driven by trained, competent and authorised operators/drivers. No unauthorised persons are to be allowed to drive construction vehicles and mobile plant;
- Provided with safe and suitable means of access;
- Fitted with adequate signalling devices to make movement safe including reversing;
- Provided with roll-over protection (where applicable);
- Inspected daily before start-up by the driver, operator and/or user and the findings recorded in a register/log book;
- Fitted with two head and two tail lights that are in good working condition and must be used whilst operating under poor visibility conditions;
- When used for transporting persons must have seats firmly secured and sufficient for the number of persons being transported.

Operators and drivers of construction vehicles and mobile plant must be in possession of a valid medical certificate declaring the operator and/or driver physically and psychologically fit to operate or drive construction vehicles and mobile plant.

No loose tools, materials etc. are allowed in the driver and/or operators compartment/cabin or in the compartment in which any other persons are transported.

No person shall ride on any construction vehicle or mobile plant otherwise than in a safe place provided thereon for that purpose. Employees shall only be transported if provision for seating and safety belts has been provided with an adequate canopy or rollover protection.

All construction vehicles and mobile plant left unattended at night, adjacent to a freeway in normal use or adjacent to construction areas where work is in progress, must have appropriate lights or reflectors, or barricades equipped with appropriate lights or reflectors, in order to identify the location of the vehicles or plant.

Bulldozers, scrapers, loaders, and other similar mobile plant must, when being repaired or when not in use, be fully lowered or blocked with controls in a neutral position, motors stopped and brakes set.

<u>Self-Propelled Mobile Machinery</u>
All Self-Propelled Mobile Machinery must be inspected daily and the findings recorded in a register. Pre-use inspection checklist shall identify critical items that would stop the operator from operating machinery should a defect be detected.

All operators shall be tested on their ability to operate machinery and equipment inspected prior to be used on any of the premises by the Johannesburg Water SOC Ltd Project Inspectors and Responsible Engineer. Relief drivers shall be made available for mobile machinery where there is a need for on-going operations and the contractor shall establish a rotation schedule.

All Drivers/Operators shall be appointed under the applicable legislation prior to operating any type of mobile equipment or machinery:

- If Driver/Operator does not adhere to the rules and regulations his appointment as operator shall be cancelled and he shall not be able to carry on with his duty.
- No Driver/Operator shall be appointed without proof of training, driver's licence or letter of competency.
- No training of Drivers/Operators on Site.
- No passengers on dump truck, Loaders or Excavators.
- No eating or drinking allowed while operating equipment.
- No vehicle shall be left unattended with engine running or key in ignition.
- Drivers may use no cellular phones during operations.

Equipment Approval

Authorization for the use of equipment shall be given in writing only after the following minimum requirements and documentation have been verified and shall as a minimum include the following:

- Minimum two lights in front and rear of vehicle
- Communications system (where required);
- Reflective Taping;
- First-aid kit, fire-fighting equipment and emergency roadside triangles;
- Tyres in good condition;
- Windscreen clear of cracks;
- Safety belts fitted for all occupants;
- Signage for clear identification;
- Windscreen wipers;
- Warning hooter and reverse alarm;
- Rotating warning lights (where applicable);
- Maximum number of persons indicated;
- Equipment free of oil and other leaks;
- Maintenance/Service & Equipment manuals available;

Operator Approval

Authorization for operators for the use of equipment shall be given in writing only after the following minimum requirements and documentation have been verified and shall as a minimum include the following:

- Operator's Certificate (accredited training organisation);
- Operators Licence appropriate to the nature of the Mobile equipment;
- Operator's knowledge tested and familiar with the controls for the vehicle;
- Public driver's permit where required;
- Medical fitness certificate.

21.18 Portable electric tools

No person shall use or permit the use of a portable electric tool with an operating voltage that exceeds 50 V to earth unless-

- It is connected to a source of electrical energy incorporating an earth leakage protection device, the construction of which meets the requirements of the relevant health and safety standard incorporated into these Regulations under section 44 of the Act; or

- It is connected to a source of electrical energy through the interposition between each tool and the source of an individually double-wound isolating transformer, the secondary winding of which is not earthed at any point and the construction of which meets the requirements of the relevant health and safety standard incorporated into these Regulations under section 44 of the Act; or
- It is connected to a source of high frequency electrical energy derived from a generator which is used solely for supplying energy to such portable electric tool and which arrangement is approved by the chief inspector; or it is clearly marked that it is constructed with double or reinforced insulation.

No person shall sell a portable electric tool constructed with double or reinforced insulation unless-

- It is clearly marked that it is constructed with such insulation; and its insulation is constructed in accordance with the relevant health and safety standard incorporated into these Regulations under section 44 of the Act.
- No employer or user shall use or permit the use of a portable electric tool which is not fitted with a switch to allow for easy and safe starting and stopping of the tool.
- The employer or user shall maintain every portable electric tool, together with its flexible cord and plug, in good working order.

22. Monthly reporting

- The Principal Contractor is required to provide Johannesburg Water SOC Ltd. with a monthly report in the format provided on the last working day of the month.
- The report will include the monthly man-hours, incidents, training, inductions, audits, etc

23. Project close out

- Upon completion of the project, the contractor is required to hand over a consolidated project file to the Client with all the working documents for retention.

ANNEXURE 1:

BASELINE RISK ASSESSMENT

	HEALTH, SAFETY & ENVIRONMENTAL (SHE) SPECIFICATION: BASELINE RISK ASSESSMENT	
Johannesburg Water	PROJECT NUMBER:	JW OPS 024/21
	PROJECT LOCATION:	FENNELL ROAD DEPOT- FLOW LABORATORY
	PROJECT DESCR:	Supply, installation and commissioning of a gravimetric flow meter test bench at Flow Laboratory (Fennell Road Depot)

POSSIBLE RISKS FOR THIS PROJECT

Task	Hazard	Risk	Consequence	Rating	Controls
Transportation of material to site	✓ Unsafe road conditions ✓ Un-road worthy vehicles ✓ Equipment and material not safely secured ✓ Incompetent drivers ✓ Driving under the influence of alcohol ✓ Inclement weather ✓ Speeding ✓ Slippery road	✓ Overturning vehicles ✓ Vehicle collisions	✓ Injuries ✓ Property damages ✓ Third party liability	**M**	✓ Adherence to the speed limit ✓ Only competent/ authorised drivers should operate the vehicle ✓ Inspection of vehicles ✓ Equipment and material to be properly secured ✓ Alcohol testing to be done ✓ The road to be paved to prevent accidents ✓ Traffic control to be implemented to avoid collisions
Replacement of electrical and mechanical equipment	✓ Working at heights ✓ Hazardous chemicals ✓ Portable electrical tools	✓ Unsafe scaffold/ladder ✓ Inhalation of fumes/dust particles ✓ Unsafe tools ✓ Improper use of	✓ Injuries ✓ Damage to property ✓ Respiratory illnesses	**H**	✓ Fall protection plan and at height risk assessment must be developed and implemented ✓ Scaffold must be erected by competent person and

		tool			inspected by competent person. ✓ Hazardous chemical substance procedure must be developed ✓ All chemicals must have MSDS and employees that use them informed about them.
Repairs, electrical installation	✓ Hand tools ✓ Energized equipment	✓ Unsafe hand tools ✓ Equipment not locked out	✓ Hand injuries ✓ Fatalities ✓ Electrocution	**H**	✓ Competent person to oversee the electrical work and to conduct the activities. ✓
Removal of waste material	✓ old material	✓ Improper disposal ✓ Improper vehicle used to transport the waste	✓ Environmental contamination	**M**	✓ Waste management plan to be developed and implemented ✓ All waste to be disposed of in a legal landfill site.

RISK ASSESSMENT MATRIX

Likelihood	Consequences				
	Insignificant (minor problem easily handled by normal day to day processes	Minor (Some disruption possible e.g.,damage equal to R150k	Moderate (significant time / resources required. E.g., damage equal to R500k	Major (Operations severely damaged. E.g., damages equal to R1m	Catastrophic (business survival is at risk. Damage equal to R5m – 10m
Almost certain (90% chance)	High	High	Extreme	Extreme	Extreme
Likely (between 50-90%)	Moderate	High	High	Extreme	Extreme
Moderate (between 10-50%)	Low	Moderate	High	Extreme	Extreme
Unlikely (between 3-10%)	Low	Low	Moderate	High	Extreme
Rare (<3%)	Low	Low	Moderate	High	High

ANNEXURE 2:

MEDICAL SCREENING POLICY

JOHANNESBURG WATER (SOC) LTD

MEDICAL SCREENING POLICY

JW OPS 024/21: Supply, installation and commissioning of a gravimetric flow meter test bench at Flow Laboratory (Fennell Road Depot)

NOTICE

It is the Contractor's responsibility to ensure that medical surveillance requirements specified in the Occupational Health and Safety Act (85/1993) and Regulations and any other applicable legal and Johannesburg Water's requirements are fully complied with.

This document is meant to facilitate the Contractor's compliance to applicable requirements and does not replace the applicable legal requirements.

This document may be revised at any time to include applicable legal requirements not currently included that may come to the attention of Johannesburg Water in future. The Contractor will accordingly be responsible to comply with the revised requirements as might be necessary.

Where methods to ensure legal compliance have been specified in this document, Contractors may submit alternative detailed method statements for consideration and approval by Johannesburg Water. Johannesburg Water may, at its sole discretion, reject or accept such alternative methods.

1 PURPOSE OF THE MEDICAL SURVEILLANCE REQUIREMENTS PROCEDURE

The purpose of this Medical Surveillance Requirements Procedure is to facilitate the achievement of legal compliance relating to medical surveillance by all Consultants, Contractors, Subcontractors and suppliers that will be working on the Johannesburg Water project and to ensure that employees are fit to work in the roles that they have been employed to execute and remain so for their duration on the project site.

This document represents the minimum requirements for medical surveillance and does not replace applicable legal requirements.

2 MEDICAL SURVEILLANCE OBJECTIVES

The Johannesburg Water main objectives for medical surveillance are:

a) To ensure compliance to all applicable medical surveillance legal requirements.
b) To ensure compliance to all Johannesburg Water's requirements regarding medical surveillance.
c) To ensure that employees are fit to execute the work for which they have been employed.
d) To prevent employees from acquiring occupational diseases or illnesses.
e) To ensure early detection and treatment of occupational diseases and to prevent the aggravation of existing medical conditions.
f) To ensure that employees on departure from the project have not contracted any occupational diseases and to enable any such condition that arises to be suitably addressed.

All contractors are required to demonstrate total commitment towards the achievement of these objectives.

3 GENERAL REQUIREMENTS

3.1 The Principal Contractor shall ensure that a medical surveillance programme is implemented for all employees.

3.2 An initial health evaluation shall be carried out by an occupational health practitioner immediately, before or within 14 days after a person commences employment, where any exposure exists or may exist, which comprises:

- an evaluation of the employees medical and occupational history;
- a physical examination; and
- any other essential examination which in the opinion of the occupational health practitioner is desirable in order to enable the practitioner to do a proper evaluation.

3.3 Medical surveillance & Immunisation shall be done accredited institutions or occupational health doctor, including, but not limited to:

a) Audiograms.
b) A cardio-respiratory examination, including full size chest x-rays.
c) Lung function tests.
d) Eye/ sight tests.
e) A general physical examination.
f) A review of previous medical history.
g) Blood pressure tests
h) Glucose tests
i) Vaccinations (Hepatitis A & Typhoid)

Copies of all medical certificates shall be submitted to the Johannesburg Water Project Specialist or Appointed OHS Agent to prior to site establishment and before an employee is allowed to come onto site.

Specific attention shall be given to the physical and psychological fitness of people who will be required to work in elevated positions and operators of mobile machinery.

An exit medical certificate shall be obtained for all workers at the end of the contract and for all workers who leave the employment of the Contractor before the end of the Project. Copies of all exit medical certificates shall be submitted to the Johannesburg Water Project Specialist or Appointed OHS Agent.

Medical surveillance shall address all occupational health risks to which the employee is exposed, identified through the risk assessment referred to in section 4 below.

Retention monies will be withheld if the exit medical is not complete for all employees.

The cost of all medical examinations will be borne by the Contractor as provision is made on the bill of quantities.

4 OCCUPATIONAL HEALTH RISK ASSESSMENT

4.1 The Contractor shall conduct an occupational health risk assessment prior to site establishment.

4.2 The Contractor shall ensure that, as far as is reasonably practicable, ergonomic related hazards are analyzed, evaluated and addressed in the risk assessment.

4.3 The methodology used by the contractor to assess occupational health risks associated with their activities shall be submitted to Johannesburg Water for approval by the Johannesburg Water Project Specialist or Appointed OHS Agent prior to site establishment. The methodology should take the following into consideration, among others:

a) Legal requirements.
b) Normal activities undertaken by the contractor.
c) Abnormal situations (e.g. unanticipated breakdown of equipment etc).

d) Emergency situations (e.g. fires, exposure to chemicals).
e) Changes in work procedures and methods.
f) Previous experience.

4.4 A risk register that will include the following shall be submitted to the Johannesburg Water Project Specialist or Appointed OHS Agent before site establishment.

a) All occupational health risks identified during the occupational health risk assessment.
b) A list of the occupational health risks that have been identified as being significant.
c) Reference to the method statements, measures or procedures that will be followed to either eliminate or reduce the significant risks to tolerable levels.

4.5 The Contractor shall, in writing, clearly explain how each occupational health risk assessed to be significant will be addressed to eliminate or reduce it to a tolerable level and submit it for approval by the Johannesburg Water Project Specialist or Appointed OHS Agent before site establishment. This may be through method statements or written operational control procedures. Associated responsibilities and authorities shall be clearly defined. All method statements shall reflect at least:

a) When the activities relating to the method statement will be conducted (timing).
b) Materials to be used.
c) Equipment and staffing requirements.
d) The proposed construction procedure designed to implement the relevant requirements.
e) The system to be implemented to ensure compliance with the method statement.
f) Any other information deemed to be necessary by the Johannesburg Water Project Specialist or Appointed OHS Agent and/or the contractor's responsible person.

4.6 For significant occupational health risks identified after site establishment, method statements shall be submitted to the Johannesburg Water Project Specialist or Appointed

OHS Agent at least 10 working days before the start of the associated activity, when possible.

4.7 All changes to approved method statements or procedures shall be approved in writing by the Johannesburg Water Project Specialist or Appointed OHS Agent.

4.8 The contractor's Responsible Person shall retain records of any amendments and shall ensure that only the most current approved version of any method statement or procedure is used.

4.9 Every occupational health risk that is identified during the risk assessment process shall be conveyed to every employee whose work is associated with the risk. This may be done in the form of a toolbox talk but does not replace the toolbox talk entirely. Each employee shall sign to confirm an understanding of the occupational health risks in the tasks.

4.10 Occupational health risk assessments may be combined with safety and environmental risk assessments, but the consideration of occupational health issues shall be clearly reflected in the records generated and maintained.

4.11 The occupational health risk assessment process and effective implementation of measures to eliminate or reduce identified risks is the responsibility of the Contractor. Johannesburg Water will closely monitor the effectiveness of implemented measures.

ANNEXURE 3:

CONTRACTOR COMPETENCY EVALUATION

SHE CONTRACTORS' COMPETENCY EVALUATION FORM

All sections must be answered. Failure to do so may result in your application not being accepted / approved

Johannesburg Water

JW OPS 024/21: Supply, installation and commissioning of a gravimetric flow meter test bench at Flow Laboratory (Fennell Road Depot)

JW OPS 024/21

CONTRACTOR / PROJECT INFORMATION

SECTION A

	Comments
CONTRACTOR NAME: _____	
ADDRESS: _____	
_____	
Street Address	
City Country Mail Code	
PHONE NUMBER: ( ) _____ FAX NUMBER: ( ) _____	
SHE CERTIFICATION : _____ (NAME) EXPIRY DATE :	

SECTION B

	Comments
CLIENT NAME: JOHANNESBURG WATER	
PROJECT NAME: _____	
PROJECT / CONTRACT JW NUMBER: _____	
PROJECT LOCATION _____ _____ _____	
City Address Mail Code	

SECTION C

FOR JW USE ONLY

PERSON COMPLETING THE EVALUATION:

PHONE NUMBER: ( ) _____ FAX NUMBER: ( ) _____

ADDRESS: (If different from above)

_____

Street Address City State Zip

TITLE: _____ SIGNATURE: _____

SECTION D	CONTRACTORS' SHE QUALIFICATION QUESTIONNAIRE

1INJURY / ILLNESS STATISTICS
USE THE PREVIOUS THREE YEARS' INJURY AND ILLNESS RECORDS TO COMPLETE THE FOLLOWING:

	20_____	20_____	20_____
NUMBER TOTAL RECORDABLE CASES			
NUMBER OF RESTRICTED WORKDAY CASES			
NUMBER OF LOST WORKDAY CASES			
NUMBER OF FATALITIES			
NUMBER OF EMPLOYEE HOURS WORKED			

	SHE MANAGEMENT SYSTEM	Yes	No	N/A	Proof required
1	Does your Company have an SHE Management System? If **Yes,** then complete subsections 1.1 – 1.2:				
1.1	Provide the type(s) / name(s) of the management system(s).				X
1.2	If this is a recognised accredited system, please attach copies of certificates.				X
2	Does your Company have a Safety, Health, and Environmental (SHE) Policy in place that is signed by the supplier's senior management?				X
3	Has your Company identified the specific SHE impacts associated with the products, services or works it provides, and the steps taken to mitigate these impacts?				X
4	Does your Company observe SHE legislation and industry best practice standards?				X
5	Has your Company been prosecuted or issued with an enforcement notice / directive / compliance notice for infringement of any SHE legislation in the past three (3) years?				
5.1	If Yes, please provide details of the prosecution / enforcement notice /directive / compliance notice and what measures were taken to ensure the issue/s would not recur.				X
6	Has your Company had any reportable incident (safety and/or environmental) in the past five (5) years?				
6.1	If yes, please provide details:				X
	ENVIRONMENTAL MANAGEMENT	Yes	No	N/A	Proof required
7	Has your company had any notices of violations, permit non- compliances or reportable spills in the past year?				
	If yes, how many?				
8	Has your Company a formally established EMS in place?				
	If so, is it based on ISO 14001 and is it certified?				X
	If not, what are your plans to do establish one in the next 12 months?				X
9	Has your Company implemented any third-party certifications or reviews related to your product or services such as Energy Star or Type III environmental declarations – Principles and procedures (ISO 14025)? If so, which one?				X
10	Does your Company measure and trend energy use?				
	Are there targets in place to reduce consumption?				
	Is there a programme in place to reduce consumption?				
11	Does your Company measure and trend waste use?				
	Are there targets in place to reduce waste?				
	Is there a programme in place to reduce waste?				
	Do you incorporate any recycled materials in your manufacturing process?				
	Can your product be easily recycled, re-used or disposed of?				
12	Does your Company have any opportunities to collaborate with us to improve environmental performance, such as transport reduction or technological improvements?				

	OCCUPATIONAL HEALTH & WELLNESS	Yes	No	N/A	Proof required
13	Does your Company have a Health and Wellness Policy/Plan and Programme?				X
14	Does your Company have an HIV/Aids Awareness Policy/Plan and Programme?				X
15	Does your Company have an Employee Assistance Programme for permanent and temporary employees?				X
16	Does your Company have a medical surveillance programme that includes permanent and temporary employees?				X
17	Does your Company have man-job specifications (risk based) for each employee (including temporary / casual and labour broker persons) that is specific to the individual, the position that they fill, the work environment and tasks that they perform?				X
	SECURITY MANAGEMENT	**Yes**	**No**	**N/A**	**Proof required**
18	Does your Company have a Security Management Policy to protect resources?				X
	EMERGENCY PREPAREDNESS PLAN	**Yes**	**No**	**N/A**	**Proof required**
19	Does your Company have a Policy/Standard on Emergency Preparedness?				X
	SUB-CONTRACTORS AND SUPPLIERS MANAGEMENT	**Yes**	**No**	**N/A**	**Proof required**
20	Does your Company appoint competent subcontractors /suppliers? (provide details of selection process and criteria)				X
21	Do you have arrangements for monitoring compliance & performance of your subcontractor/supplier?				X
	VEHICLE SAFETY	**Yes**	**No**	**N/A**	**Proof required**
22	Does your Company have a policy that addresses Driver, Passenger and Vehicle Safety (which includes vehicle maintenance, driver/operator competence)?				X
23	Do your Company's motor vehicles / cycles, construction vehicles, mobile plant used/hired comply with the manufacturer's design and legal requirements?				
	HYGIENE MONITORING	**Yes**	**No**	**N/A**	**Proof required**
24	Does your Company have an Occupational Hygiene Programme?				
	SHE COMPETENCY	**Yes**	**No**	**N/A**	**Proof required**
25	Supervisors: Do the Appointed Supervisors have the required training, knowledge and experience specific to the work to be performed? (Proof has to be provided)				X
26	Does/Do the SHE functionary (ies) have the required SHE-related training, knowledge and experience specific to the work being performed? (Proof has to be provided)				X
27	Do employees have the appropriate qualifications and experience for performing the assigned tasks?				X
28	If not, are they under direct and controlled competent supervision?				X
	FIRE PREVENTION	**Yes**	**No**	**N/A**	**Proof required**
29	Are the fire risks being assessed and is provision made for the risks?				
	HAZARDS IDENTIFICATION & RISK ASSESSMENT (HIRA)	**Yes**	**No**	**N/A**	**Proof required**
30	Does your Company have procedures in place for conducting hazard identification and risk assessments and for developing and implementing safe systems of work/method statements?				X
31	Does your Company have an updated Legal Register of the applicable legislation with which it has to comply?				X
32	Does your Company have a competent person appointed to carry out hazard identification and risk assessments?				X
33	Do employees perform hazard identification and a risk assessment prior to the commencement of a task?				X
34	Does your Company have a standard/procedure on the hierarchy of control principles that is applied to the mitigation of risks?				X

TRAINING MANAGEMENT		Yes	No	N/A	Proof required
35	Does the Company have an orientation and safety induction programme/ policy?				
36	Does the Company have implemented training arrangements in place to ensure that employees have sufficient skills and understanding to discharge their various duties? This includes refresher training that will keep employees updated on legislation and good health, safety and environmental practice. This applies throughout the Company, from top management to trainees.				X
37	Are training records kept?				X
38	Have training matrices been developed and implemented?				X
40	Have team leaders and team members been given the appropriate level of First Aid training?				X
COIDA		**Yes**	**No**	**N/A**	**Proof required**
41	Is your company registered with COIDA or a mutual company and are you still in good standing? If yes, please provide copy of current valid certificate issued by the Compensation Commissioner.				X
42	Are all the Company's employees registered with COIDA?				X

REFERENCES – PLEASE PROVIDE AT LEAST TWO(2) CLIENTS REFERENCES		
1	Client's name:	
	Description of works, services, product:	
	Duration of contract (specify start and end dates):	
	Value of contract/work/services/product:	
	Contact telephone number/s:	
	Number of 'near misses' reported:	
	Number of lost-time injuries:	
	Number of disabling injuries:	
	Number of motor vehicle incidents/accidents:	
	Number of fatalities:	
	Number of lost-time injuries:	
	Largest number of permanent staff members working for the supplier during the contract period:	
	Number of permanent or non-permanent staff members involved in the work/services/product on the contract: Total number of staff days lost due to Injuries:	
	Number of incidents of non-compliance to environmental legislation (including conditions of environmental authorisations / permits / licences):	
	Number of environmental incidents:	
2	Client's name:	
	Description of works, services, product:	
	Duration of contract (specify start and end dates):	
	Value of contract/work/services/product:	
	Contact telephone number/s:	
	Number of 'near misses' reported:	
	Number of lost-time injuries:	
	Number of disabling injuries:	

Number of motor vehicle incidents/accidents:	
Number of fatalities:	
Number of lost-time injuries:	
Largest number of permanent staff members working for the supplier during the contract period:	
Number of permanent or non-permanent staff members involved in the work/services/product on the contract: Total number of staff days lost due to Injuries:	
Number of incidents of non-compliance to environmental legislation (including conditions of environmental authorisations / permits / licences):	
Number of environmental incidents:	

COMPANY SIGN-OFF

I acknowledge that the information provided in this SHE Contractors' Competency Questionnaire, as part of the Johannesburg Water evaluation process, is true and correct.

Company name	
Name and surname	
Position	
Signature	
Date	

FOR OFFICE USE ONLY					
SCORING:					
A: Each question scores one (1) point. Total possible points					
Percentage Score = Actual Score Possible Score x 100 = ____%					
Note: if a question is Not Applicable, do not score any points.					
B: Subsections:	Actual score	Total			
Organisational structure and contact details of key persons					
Comments:					
SUPPLIER EVALUATION RESULT – Comply/Not Comply					
Approved /Not approved (NOTE: Gatekeeper of minimum of 80% is required)					

NAME OF ASSESSOR:	
SIGNATURE:	
DATE:	

ANNEXURE 4:

ENVIRONMENTAL MANAGEMENT PLAN

Johannesburg Water SOC Ltd

Environmental Management Plan

Prepared By:

OHSE & DM

Environmental Section

PO Box 61542

Marshalltown

DISCLAIMER

1. Should there be any other Environmental related activities issued as non-compliance during construction, the contractor is liable to comply with those requirements
2. Should the contractor deviate from the conditions and requirements of the EMP and/or Environmental Authorisation(if applicable), the contractor is liable for non-compliances, rectification and associated fines thereof
3. This EMP does not exempt the Contractor from complying with other relevant legislations related to the construction activities.

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LIST OF APPENDICES

LIST OF ACRONYMS

Acronym	Description
BA	Basic Assessment
BAR	Basic Assessment Report
CA	Competent Authority
DEA	Department of Environmental Affairs

DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EO	Environmental Officer
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme Report
GDARD	Gauteng Department of Agriculture and Rural Development
GN	Government Notice
I&AP	Interested and Affected Party
JW	Johannesburg Water
km	Kilometre
m	meter
MSDS	Material Safety Data Sheets
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NWA	National Water Act, 1998 (Act No. 36 of 1998)
PHRAG	Provincial Heritage Resources Authority for Gauteng
RE	Resident Engineer
WUL	Water Use License
WULA	Water Use License Application
WWTW	Wastewater Treatment Works

DEFINITIONS

Environment

The surroundings in which humans exist and which comprise of:

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

Environmental Aspect

Those components of the company's activities, products and services that is likely to interact with the environment.

Environmental Authorisation

The written statement from the relevant environmental authority in terms of the National Environmental Management Act (Act 107 of 1998), with or without conditions, that records its approval of a planned activity and the implementation thereof and the mitigating measures required to prevent or reduce the effects of environmental impacts during the life of a contract.

Environmental Impact Assessment (EIA)

The decision making process of examining the environmental impacts of a development in terms of the NEMA (107 of 1998) and the EIA Regulations (Government Notice No.R982, R983, R984, R985 and R986).

Environmental Management Programme (EMPR)

An environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented; and that the positive benefits of the projects are enhanced.

Environmental Management System (EMS)

A set of process and practices that enable an organization to reduce its environmental impacts and increase its operational efficiency. The EMS provides a framework that helps a company achieve its environmental goals through consistent control of its operations.

Auditing

A systematic and objective assessment of an organization's activities and services conducted and documented on a periodic basis internally and externally.

Environmental Objective

An overall environmental goal, arising from the environmental policy, that an organization sets itself to achieve, and which is quantified where practicable.

Environmental Target

A detailed performance requirement, quantified where practicable, applicable to the organization or parts thereof, that arises from the environmental objectives and that needs to be set and met in order to achieve those objectives.

Floodplain

A flat expanse of land bordering a river channel, formed through sediment deposition and other alluvial processes, and often characterized by frequent flooding as a result of bank overspill from the river channel.

Groundwater

Sub-surface water in the zone in which permeable rocks, and often the overlying soil, are saturated.

Hazardous waste

Waste that are proven to be toxic, corrosive, explosive, flammable, carcinogenic, radioactive, poisonous or classified as such in legal terms.

Heritage Resource

Any place or object of cultural significance including buildings, structures, landscapes, graves and geological, archaeological artefacts and paleontological sites.

Landscape

Land modified for human use and occupation, embracing both the natural (wilderness) environment and the urban.

Management actions

Practical actions aimed at achieving management objectives and targets.

Management objectives

Desired outcome of management measures for mitigating negative impacts and enhancing the positive impacts related to project activities and aspects (i.e. risk sources).

Monitoring

A systematic and objective observation of an organization's activities and services conducted and reported on regularly.

Natural Vegetation

All existing vegetation species, indigenous or otherwise, of trees, shrubs, groundcover, grasses and all other plants found growing on the site.

Pollution

Any change in the environment caused by substances, radioactive or other waves, or noise, odours, dust or heat, emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or well-being or on the composition, resilience and productivity of natural or

managed ecosystems, or on materials useful to people, or will have such an effect in the future. Furthermore pollution can also be regarded as an undesirable state of the natural environment being contaminated with harmful substances as a consequence of human activities.

Protected Plants

Plant species officially listed on the Protected Plants List (each province has one), and which may not be removed or transported without a permit to do so from the relevant provincial authority.

Reinstatement

Reinstatement is defined as the return of a disturbed area to a state, which approximates the state (where possible), which it was before disruption.

Riparian Habitat

The physical structure and associated vegetation of the areas associated with a watercourse which are commonly characterised by alluvial soils, and which are inundated or flooded to an extent and with a frequency sufficient to support vegetation of species with a composition and physical structure distinct from those of adjacent land areas.

Runoff

The total water yield from a catchment including surface and subsurface flow.

Sensitive environmental features

Environmental features protected by legislation (e.g. heritage resources), or identified during the EIA as sensitive through specialists' findings and input received from Interested and Affected Parties.

Subsoil

The soil horizons between the topsoil horizon and the underlying parent rock.

Topsoil

Topsoil can be regarded as the fertile upper part or surface of the soil.

Transplanting

The removal of plant material and replanting the same plants in another designated position.

Veld

Unimproved areas of natural vegetation

Wastewater

Means water contaminated by the project activities.

Watercourse

A geomorphological feature characterized by the presence of a stream flow channel, a floodplain and a transitional upland fringe seasonally or permanently conveying surface water.

Waterlogged

Soil or land saturated with water long enough for anaerobic conditions to develop.

Weeds and Invader Plants

Weeds and invader plants are defined as undesirable plant growth that shall include, but not be limited to all declared category 1, 2 and 3 listed invader species as set out in the Conservation of Agricultural Resources Act (No 43 of 1983) regulations. Other vegetation deemed to be invasive should be those plant species that show the potential to occupy in number, any area within the defined construction area.

Wetland

Land where a surplus of water (i.e. waterlogging) is the key factor determining the nature of the soil development as well as the types of plants and animals living at the soil surface.

1. BACKGROUND

The purpose of this document is to provide management measures that will ensure that potential negative impacts associated with the activity are minimized whilst positive impacts are optimised, provided that the EMP is implemented by a suitably qualified Environmental Officer (EO). The proponent developer, the main contractor and the sub- contractor are responsible for the implementation of the EMP throughout the stages. Therefore it is imperative that the EMP is circulated to site managers, contractors and Depots who will perform any work on site which has the potential to cause environmental damage. Any parties responsible for transgression of the underlying management measures outlined in this document will be held liable for non-compliances.

The following is a generic EMP to mitigate against "generally occurring impacts" associated with the construction phase of Johannesburg Water`s activities. "Generally occurring impacts" refers to potential impacts typical of Johannesburg Water's activities, and are not restricted to a single or specific site. The findings of this EMP will be implemented at all sites.

This section forms an integral part of the **Contract Specification** and, in particular, shall be a part of the

ENVIRONMENTAL MANAGEMENT PLAN FOR DESING, CONSTRUCTION AND OPERATIONAL ACTIVITIES.

PURPOSE

The purpose of this EMP is to ensure that Johannesburg Water conducts all its activities related to the construction and maintenance in accordance with the provisions of NEMA, and other applicable legislations. This EMP has taken into account the provisions of the Constitution and the principles of Integrated Environmental Management.

2. APPLICABLE LEGISLATIONS

Several laws and regulations apply to the protection of the environment and contain environmental principles and standards that need to be applied and permits and licences that need to be obtained. This EMP will be subject to regulatory control under a range of State, Provincial and Local regulations. Such legislation largely embraces pollution prevention, resource use and conservation, and socio cultural (heritage) protection. This chapter reviews legislation pertaining to this generic EMP.

According to Section 2 (1, 2 & 3) of the National Environmental Management Act No. 107 of 1998 (NEMA), all organs of state have to apply certain principles set out in NEMA when taking decisions that may significantly affect the environment. The key principles of this Act include that all "actions" that they approve must be economically, socially and environmentally sustainable. It further states that "people and their needs" must be at the forefront of "its concern" and their interests must be served equitably.

These legislative requirements include, but are not limited to, the provisions of the legislation represented is described below:

The Constitution of the Republic of South Africa Act No. 108 of 1996)

Section 24 of the Constitution of South Africa (Act 108 of 1996) states that "Everyone has the right (a) to an environment that is not harmful to their health or well-being; and

(b) To have the environment protected, for the benefit of present and future generations through reasonable legislative and other"

Measures that:

- Prevent pollution and ecological degradation;
- Promote conservation; and
- Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development".
- Section 152 of the Constitution states that the objectives of local government are to:

- Ensure that services are provided to communities in a sustainable manner;
- Promote social and economic development; and
- Promote a safe and healthy environment.

National Environmental Management Act, Act No. 107 of 1998 (as amended)

The National Environmental Management Act 107 of 1998 (NEMA) requires that an environmental authorization is obtained before activities, which have been listed in terms of NEMA, are commenced with. The failure to obtain such an environmental authorization, before commencing with listed activities, could result in administrative sanctions, including compliance notices or directives ordering the cessation of the operations until authorized; and fines of up to ZAR10 million for each such contravention.

The Environmental Impact Assessment Regulations (EIA Regulations) set out the process to be followed in applying for an environmental authorization, while the listing notices; list the activities that require authorization (the Listing Notices). National Environmental Management Act (NEMA) 107 of 1998 amended in 07 of April 2017.The following are the listed activities:

- EIA Regulations GNR 326
- Listing Notice 1; Government Notice Number (GNR) 327 (Basic Assessment).
- Listing Notice 2; Government Notice Number (GNR) 325 (Full EIA/ Scoping & Environmental Impact Report).
- Listing Notice 3; GNR 324 (It applies on both Basic Assessment and full EIA).

National Environmental Management: Biodiversity Act, Act No. 10 of 2004

Provides management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act 107 of 1998; the protection of species and ecosystems that warrant national protection and the sustainable use of indigenous biological resources.

The National Environmental Management Waste Act, Act 59 of 2008

The National Environmental Management Waste Act (NEMWA) reforms the law regulating waste management in order to protect health and the environment providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development; to provide for institutional arrangements and planning matters; to provide for national norms and standards for regulating the management of waste by all spheres of government; to provide for specific waste management measures; to provide for licensing and control of waste management activities; to provide for the remediation of contaminated land; to provide for the national waste information system; to provide for compliance and enforcement; and to provide for matters connected therewith.

The Occupational Health and Safety Act, Act No. 85 of 1993

The Occupational Health and Safety Act make provision in regulation

- Section 8 for the general duties of employers to their employees.
- Section 9 of the Regulations makes provision for general duties of employers and self-employed persons to persons other than their employees.

National Heritage Resources Act (NHRA) 1999Act No. 25 of 1999

The protection and management of South Africa's heritage resources are controlled by the National Heritage Resources Act. The South African National Heritage Resources Agency (SAHRA) is the responsible authority for implementing the National Heritage Resources Act (NHRA) 1999, (Act 25 of 1999).

Section 38(1) of the NHRA lists development activities that would require authorisation by the responsible heritage resources authority. Activities considered applicable to the proposed project include the following:

(*c) Any development or other activity which will change the character of a site:*

(i) Exceeding 5 000 m2 in extent; and

(ii) The rezoning of a site exceeding 10 000 m2 in extent.

Water Services Act, Act No. 108 of 1997

This Act provides for the rights of people to amongst others, basic sanitation. It acknowledges that that there is a duty on all spheres of government to ensure that sanitation services are provided in a manner which is efficient, equitable and sustainable and that it should be sufficient for subsistence and sustainable economic activity. The provision of sanitation services must be undertaken in a manner consistent with the broader goals of water resource management. This project is in line with the Act as it aims to provide sufficient sanitation services to the region in a sustainable manner.

Conservation of Agricultural Resources (CARA) Act, Act No. 43 of 1983

The CARA aims to ensure the protection of agricultural resources such as land with agricultural potential and water and makes provision for the eradication of alien and invasive species.

NEMA Air Quality Act (AQA), Act No. 39 of 2004

The aim of this law is to regulate air quality and protect the environment in South Africa through reasonable measures to prevent pollution and ecological degradation, while securing sustainable development. The Act also provides national norms and standards for air quality management, monitoring and control. Under this legislation, Priority Air shed Areas can be proclaimed, where specific Air Quality Management Plans are applicable. Regulations are also published under this Act for the format of air quality assessments and what should be included in the assessment. The proposed Sedibeng Regional Sanitation Scheme (SRSS) is located in the Vaal Triangle Air shed Priority Area (VTAPA) as proclaimed under in National Environmental Management: Air Quality Act, Act No. 39 of 2004(NEMAQA) in Government Notice 1241 of November 2008. An Air Quality Management Plan has been compiled for the area and the proposed WwTW should be in line with this Management Plan. This Act may list activities which may result in atmospheric emissions and which may have a significant detrimental effect on the environment.

Government Gazette 32434 of 24 July 2009 listed activities, which require an atmospheric emission license before it commences. Air quality limits and thresholds are fundamental to effective air quality management,

providing the indicators to safe exposure levels for the majority of the population. The current South African standards have been revised and National Ambient Air Quality Standards were promulgated on the 24th of December 2009 (Government Gazette No. 32816, Notice No. 1210). The newly proposed standards include particulate matter specifically PM10 (particulates with a diameter of less than 10 micrometre), sulphur dioxide (SO2), nitrogen dioxide (NO_2), ozone (O3), lead, carbon monoxide (CO) and benzene. These revised standards have been adopted as the VTAPA air quality objectives. Any emissions from the proposed WWTW should be within these standards.

National Water Act (NWA), Act 36 of 1998

Water use is controlled by the National Water Act (NWA) Act No. 36 of 1998. The NWA recognises that water is a scarce resource in South Africa and its provisions are aimed at achieving sustainable use of water to the benefit of all users. The provisions of the Act are thus aimed at discouraging pollution and waste of water resources. According to Section 21 of the NWA the following activities require a water use licence (WUL) prior construction:

"21.(a) taking water from a water resource;

21.(b) storing water;

21.(c) impeding or diverting the flow of water in a watercourse;

21.(d) engaging in a stream flow reduction activity contemplated in section 36;

21.(e) engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1);

21.(f) discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;

21.(g) disposing of waste in a manner which may detrimentally impact on a water resource;

21.(h) disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process;

21.(i) altering the bed, banks, course or characteristics of a watercourse;

21.(j) removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and

21.(k) using water for recreational purposes."

3. OBJECTIVES OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME

The purpose of this EMP is to provide an easily interpreted reference document that ensures that the project environmental commitments, safeguards and mitigation measures from the environmental planning documents, project approvals, and Scope of Works are implemented.

The objectives for the EMP are:

- To develop, implement and maintain effective management systems for the environmental aspects ;
- To document details of environmental protection infrastructure and controls so that they are able to provide long term protection for the natural environment;
- To ensure compliance with relevant legislation (National, Provincial and Local), regulatory requirements and environmental documents;
- To maximise the value and outcomes of environmental monitoring activities so that the information can be applied to the planning and implementation of future projects;
- To ensure that all Environmental Management considerations are implemented during the operational and maintenance phases of the project.

All the Environmental specifications and the procedures discussed in this document were also developed in accordance with the relevant legislation applicable to the development.

3.1 Phases of the Project

The EMP deals with the following phases as detailed below:

3.1.1 The Planning and Design Phase

Overall Goal for Planning and Design: Undertake the planning and design phase of the development in a way that:

- Ensures that the design of the proposed developments responds to the identified environmental constraints and opportunities.
- Ensures that the best environmental options are selected for all components of the project.
- **Ensure that there is sufficient financial provision for environmental assessment, monitoring and rehabilitation.**

The EMP offers an ideal opportunity to incorporate pro-active environmental management measures with the goal of attaining sustainable development.

Pro-active environmental measures minimize the chance of impacts taking place during the construction and operational phase. There is still the chance of accidental impacts taking place; however, through the incorporation of contingency plans (e.g. this EMP) during the planning phase, the necessary corrective action can be taken to further limit potential impacts. In order to meet this goal, actions plans for the planning and design phase have been identified together with monitoring requirements.

3.1.2 The Construction Phase

The bulk of the impacts during this phase will have immediate effect (e.g. noise-, dust- and water pollution etc.) If the site is monitored on a continual basis during the construction phase, it is possible to identify these impacts as they occur. These impacts will then be mitigated through the contingency plans identified in the planning phase, together with a commitment to sound environmental management from Johannesburg Water.

3.1.3 Rehabilitation / Reinstatement Phase

This phase will involve restoring the land impacted during the construction phase back to its original state. This process will mainly on rectifying the negative impacts that have been caused during construction by the

removing pollution or contaminants and other dangerous substances from groundwater, sediment, or surface water and improvement of the soil.

3.1.4 The Operational Phase

By taking pro-active measures during the planning and construction phases, potential environmental impacts emanating during the operational phase will be minimised. This, in turn, will minimise the risk and reduce the monitoring effort, but it does not make monitoring obsolete.

4. ROLES AND RESPONSIBILITY

The implementation of this EMPr requires the involvement of several stakeholders, each fulfilling a different but vital role to ensure sound environmental management during the construction and operational phases. The stakeholders are discussed below.

4.1 Johannesburg Water

Shall:

- Ensure that the EMP is kept on JW's Sites and construction sites.
- Remain ultimately responsible for ensuring that the development is implemented according to the requirements of the EMP.
- **Ensure that the Environmental section attends all project related tender briefing sessions.**
- Although Johannesburg Water appoints specific role players to perform functions on his/her behalf, this responsibility is delegated.
- Be liable for restoring the environment in the event of negligence leading to damage to the environment.
- **Ensure that the EMP is included in the tender documentation so that the contractor who is appointed is bound to the conditions of the EMP, and there's sufficient budget for Environmental assessments and/or assessment during the planning, design, construction, decommissioning (rehabilitation) phases of the project.**
- Ensure that the contractor appointed understands and acknowledges the content of this EMP.

- **Monitor compliance with the conditions of the environmental authorisation and the EMP and compliance audits are undertaken.**
- Ensure that the Environmental section signs all close out reports to confirm rehabilitation.

4.2 Appointments and competencies

- The contractor and its appointed sub-contractor must meet the relevant legislative and non-statutory appointments, which must be maintained valid for the entire contract duration.
- All appointees shall be suitably trained and certified competent for the responsibilities they are assigned for.
- Copies of all relevant appointments and the relevant competence certificates must be kept in the relevant Environmental file.

Table 1: Environmental Appointment Index

Appointment	Project Type	Legislative Ref	Competency requirements (Min)
Contractor SHE Officer	Unauthorised Project	JW EMP/ JW Waste Management Procedure	N.Dip Safety & Basic ISO14001:2015/ Basic Environmental Awareness (Introduction or Awareness to ISO14001:2015) + 2yrs exp/ OR N.Dip in Environmental Management + 2yrs exp; OR NEBOSH / SAMTRAC & Basic ISO14001:2015/ Basic Environmental Awareness (Introduction or Awareness to ISO14001:2015) + 4yrs exp Register with SACPCMP
Contractor Environmental Liaison Officer/Environmental Officer	Authorised project	JW EMP and Project Specific approved EMP /Directives/Environmental Authorisation/GA/WUL	N.Dip in Environmental Management/ + 3 years exp; BA/BSc Environmental Management + 3 years exp;
Consultant Environmental Control Officer	Authorised project (as and when required)	JW EMP and Project Specific approved EMP /Directives/Environmental Authorisation/GA/WUL	Reputable Environmental Consulting Company N.Dip or BA/BSc Environmental science or management + 3 years ' experience as an independent ECO

4.3 The Contractor

Shall:

- Be bound to conform to the EMP conditions through his/her contract with Johannesburg Water, and is responsible for ensuring that he adheres to all the conditions of the EMP.
- Thoroughly familiarise himself/herself with the EMP requirements before construction begins and must request clarification on any aspect of these documents, should they be unclear.
- Ensure adherence to the environmental management specifications.
- Ensure that any instructions (whether verbal or written) issued by the site Manager, project manager, site engineer or EO, in terms of the EMP is adhered to.
- Ensure that a report is tabled at each site meeting, which will document all incidents report that has occurred during the period before the site meeting.
- Ensure that incidents register is kept in the site office.
- Ensure that a register of all public complaints is maintained.
- Ensure that all employees, including those of sub-contractors receive Environmental Induction before the commencement of construction in order that they can constructively contribute towards the successful implementation of the EMP (i.e. ensure their staff are appropriately trained as to the environmental obligations).
- Appoint an Environmental Liaison Officer (ELO) prior Construction for Environmental Authorised Projects.
- Appoint SHE Officer prior Construction for unauthorized projects i.e. the SHE Officer with Environmental Management experience or be trained on Environmental legislation.

4.4 Environmental Liaison Officer (ELO)/ SHE Officer:

Shall:

- Ensure that the project team is involved in all aspects of project planning that can influence environmental conditions on the site.

- Be permanently on site during the construction phase to oversee the Contractor's internal compliance with the EMP requirements and ensuring that the environmental specifications are adhered to.
- Assist with day-to-day monitoring of the construction activities.
- Ensure that any issues raised by the EO will be routed to the SHE Officer for the contractors' attention.
- The ELO/ SHE Officer shall be permanently on site during the construction phase to oversee the Contractor's internal compliance with the EMP requirements and ensuring that the environmental specifications are adhered to.
- Be responsible for keeping detailed records of all site activities that may pertain to the environment and include all these aspects in an environmental register.
- The ELO/SHE Officer must keep a register of complaints from any community members on environmental issues.
- The ELO /SHE Officer will be required to keep a record of all on-site environmentally related incidents and how these incidents were dealt with.
- Ensure proper rehabilitation is undertaken before site closure.

4.5 Resident Engineer (RE)/ Site Agent

Shall:

- Liaise with the Contractor and Environmental Officer (EO) on environmental matters, as well as any pertinent engineering matters where these may have environmental consequences.
- Oversee the general compliance of the Contractor with the EMP and other pertinent site specifications.
- Familiarise him/herself with the EMP specifications and further monitor the Contractor's compliance with the Environmental Specifications on a daily basis, through the Site Diary, and enforce compliance.
- Ensure that Monthly Audits reach the contractor before Monthly Progress Meeting.
- Ensure proper rehabilitation is undertaken before site closure.

4.6 Project Engineer /Inspectors (PE/PI)

Shall:

- Ensure that there is a sufficient budget for complying with all EMP conditions at the tender stage.
- Ensure sufficient budget is provided for rehabilitation/ Reinstatement.
- Ensure proper rehabilitation is undertaken before site closure.
- Ensure of all specifications and legal constraints specifically with regards to the environment are highlighted to the Contractor(s) so that they are aware of these.
- Ensure that Contractor(s) are made aware of all stipulations within the EMP.
- Ensure that the EMP is correctly implemented throughout the project by means of site inspections and meetings. This will be documented as part of the site meeting minutes.
- Be fully conversant with the EIA for the project, the EMP, the conditions of the Environmental Authorisation (if applicable), and all relevant environmental legislation.
- Ensure compliance monitoring of contractors on a day to day basis.
- Ensure adherence and implementation of the tender requirements.
- Ensure reference of specific non-compliance/non-conformance issues to the responsible units and/or contractors.

4.7 Environmental Officers

Shall:

- Be responsible for informing the contractors of any decisions that are taken concerning environmental management during the project phase. This would also include informing the contractors of the necessary corrective actions to be taken
- Liaise with environmental authorities where necessary.
- Review all the environmental documents from the Contractor, including sign off.
- Conduct environmental monthly audits of all contractors' work on site where necessary
- Maintain site documentation of related to environmental management (EMP, Method statements, audit reports, monitoring results, receipts of waste removal etc.). Documents to be maintained on the relevant site Documents Control Systems.
- Inspect and report on environmental incidents and check corrective actions.
- Conduct environmental incidents enquiries.

- Review and sign off method statements prepared by Contractors.
- Ensure that an environmental compliance monitoring strategy/framework is implemented.

4.8 Environmental Control Officer (ECO)

The role of the ECO shall be to:

- Act as site 'custodian' for the implementation, integration and maintenance of the EMPr in accordance with the contractual requirements;
- Ensure successful implementation of the EMPr; and
- Ensure that the Contractor, his employees and/or Subcontractors receive the appropriate environmental awareness training prior to commencing activities.

The responsibilities of the ECO will be to:

- Liaise with the JW Environmental Section and Project Engineer on the level of compliance with the EMPr achieved by the Contractor on a regular basis for the duration of the contract;
- Advise the Project Engineer on the interpretation and enforcement of the Environmental Specifications (ES), including evaluation of non-compliances;
- Supply environmental information as and when required;
- Review and approve Method Statements produced by the Contractor, in conjunction with the PM and EO;
- Monitor any basic physical changes to the environment as a consequence of the construction works according to an audit schedule;
- Attend regular site meetings and project steering committee meetings;
- Undertake regular monthly audits of the construction works and to generate monthly audit reports. These reports are to be forwarded to the JW EO who will communicate the results and conclusions with the principal Contractor;
- Submit a monthly audit report to the authority as per the requirement of issued Environmental Authorisation.

- Communicate frequently and openly with the Contractor and the Project Engineer to ensure effective, proactive environmental management, with the overall objective of preventing or reducing negative environmental impacts and/or enhancing positive environmental impacts;
- Advise the Project Engineer on remedial actions for the protection of the environment in the event of any accidents or emergencies during construction, and to advise on appropriate clean-up activities;
- Review complaints received and make instructions as necessary; and
- Identify and make recommendations for minor amendments to the EMPr as and when required.

5. CONTENTS FOR CONTRACTOR'S ENVIRONMENTAL FILE

The following documents must be submitted by the contractor in the Environmental file before Construction commences on site. The file must be submitted to the Environmental Section prior construction for approval. The Contractor should achieve a minimum score of 80% for the file to be approved.

See annexure B : Environmental File Specification

6. ENVIRONMENTAL SPECIFICATIONS

Table 2: Environmental Management and Mitigation Measures that must be implemented during the Design Phase and Construction Phase

Design Phase Measures						
Aspects	**ID**	**Mitigation Measure/Procedure**	**Responsible**	**Implementation Timeframe**	**Monitoring Methods**	**Performance indicators**
Project Planning/Design	**1**	• Proposed project is submitted to Environmental Section for screening (Project scope/layout/Maps), • CAPEX and Ops must ensure that there is budget allocated for environmental management throughout the project life cycle i.e. planned project and Directives.	Johannesburg Water (CAPEX/Ops)	Before project commences	• Screening report • Tender document	Keep the records of the project screening report and scope of work as per Directives
Authorisation	**2**	• Appoint Consulting Company • Ensure that all required licences and permits have been obtained before the start of construction. • Ensure that ECO and/or ELO is appointed as per the authorisation and EMP requirement during project execution (as when and required).	Johannesburg Water (CAPEX/ Environmental Section)	Before construction commences	Keep record of all permits, licences and authorisations	Keep record of all permits, licences and authorisations
Project Handover		• The scope of a project is outlined by CAPEX Engineer during the handover meeting. • Environmental Management Requirements are outlined during the handover meeting.	Johannesburg Water (CAPEX/ Environmental Section)	Before construction commences	Meeting invite EA/GA/WUL/ Screening report	Keep record of all permits, licences and authorisations
Environmental		• Environmental awareness training is given to	Johannesbur	Before	Meeting invite	Meeting records

Awareness Training/Inductions		the Project Team Leaders • Environmental File Specification provided to the Contractor. • JW Environmental Management Plan and other procedures are provided to the Contractor.	g Water (CAPEX/ Environmental Section)	construction commences		
Environmental File Evaluation		• Contractor submits environmental file for approval prior work commences on site. • Construction activities/work (including site establishment) should ONLY commence when file is approved.	Appointed Contractor/Environmental Section	Before construction commences	Environmental evaluation report.	Approval/ rejection letter records
Construction Phase Measures						
Aspects	**ID**	**Mitigation Measure/Procedure**	**Responsible**	**Implementation Timeframe**	**Monitoring Methods**	**Performance indicators**
Site camp establishment	**1**	• Invite the Environmental Officer for the site inspection of proposed site camp prior establishment. • Submit a method statement for Site Camp establishment for approval by JW Environmental Officer/ECO prior commencement of works. • Establish a suitably fenced Site Camp at the start of the contract, which will allow for site offices, vehicle, equipment, material and waste storage areas to be consolidated as much as possible. Locate the Site Camp at a position approved by the JW EO, at least	All Contractors	Before commencement of Project	• Visual inspection • Site establishment checklist	Method statements approved by CAPEX and the Environmental Officer • Position of Site Camp approved by ECO • Security and access to Site

		100m from watercourses and in an area which is not ecologically sensitive. • Provide water and/or washing facilities at the Site Camp for personnel. • Lim it construction and lay down areas to areas within the development footprint. • Ensure that environmentally friendly on-site sanitation options are selected and these facilities are properly managed and maintained. • Designated eating areas shall be provided on site. • These eating areas shall be clearly demarcated and shall be provided with bins with lids. • Staff will be prohibited from consuming meals anywhere other than at these eating areas and that noise is limited. • All eating areas shall include provision for a water and smoking area.				Camp controlled • Clear demarcation of no-go areas as agreed with JW EO. • Detailed site layout plan • Environmental file approval letter.
Environmental Awareness Training	**2**	• Provide environmental awareness training to all personnel on site at the start of their employment. Training should include discussion of: • Potential impact of construction waste and activities on the environment; • Suitable disposal of construction waste and	All Contractors	• Before workers start working onsite • Before new activities are	• Check training attendance register • Observe whether activities	• Proportion of workers that completed. • Environmental training Compliance of workers

		litter; • Key measures in the EMPr relevant to worker's activities; • How incidences and suggestions for improvement can be reported. • Ensure that all attendees remain for the duration of the training and on completion sign an attendance register that clearly indicates participants' names.		undertaken	are executed in line with EMPr requirements	with EMP
Plant Search and Rescue/Vegetation clearing	**3**	• From information gathered during the plant marking exercise, establish the size. • Requirements for the plant rescue team workforce, and the methodology to be employed during the rescue to maximise the likelihood of success; Document and motivate which species found on site are considered to be conservation worthy. • Follow a multi-pronged approach to maximise the likelihood of success wherever feasible. In addition to transplanting of whole plants, seed can be collected and sown in situ in suitable habitats and/or in an off-site nursery. • Any plants not suitable for transplantation must be considered for transplanting to existing conservation areas nearby. This could involve growing these plants on in an off-site	All Contractors	Before commencement of activities	Visual Inspection/ inspection by Botanist/Ecologist	• Incidents of harm coming to fauna/ flora; • Number of incidents of disturbance of vegetation outside construction site boundary; and • Size of area cleared relative to development

		nursery for a period of time. • Depending on the conservation worthy species found, the location of suitable existing conservation areas nearby and the location of the off-site nursery, the most appropriate plant rescue options must be detailed in the search and rescue plan, and could be a combination of the following options: • All required permits must be obtained from the appropriate authority covering plants to be affected by the plant rescue operation prior to the removal of the plants. • Demarcate the area for construction prior to each phase, and prevent access by construction personnel outside of this area. • Appoint a suitably qualified botanist to undertake search and rescue of key plant species in the development footprint where necessary (Where is applicable. Clearly demarcate sensitive areas, including buffers, with appropriate signage. • Do not allow personnel to enter calcrete vegetation areas. • Do not allow personnel to pick or destroy plants outside of the construction footprint. • Limit clearing to those areas within the				footprint • Size of area disturbed outside of construction site boundary. • Areas of development footprint must be clearly demarcated

		footprint of construction for each phase. • Restrict construction vehicles to designated roadways. • Do not allow the temporary storage of building material within sensitive areas. **Aftercare and monitoring** • Record numbers and diversity of propagated plants and the health of the same, until they can be planted out; • Aftercare of transplanted plants to be done in accordance with the plant search and rescue plan by an appropriate agent (e.g. staff from the commercial nursery or an appropriately trained onsite Contractor), including watering and alien plant control requirements. If done correctly, the frequency of input will decrease with time; • Record numbers and diversity of transplanted plants and the health of the same; • Monitoring must be undertaken as per requirements of the plant search and rescue plan approved by GDARD, including monitoring of alien plants and maintenance of a photographic record; and • Provide a detailed record (including photographic record) that indicates the				

		success of the plant rescue operation. Records of corrective action taken to improve management of transplanted plants, where relevant, must also be completed. **Applicable Legislation** • National Environmental Management Act: Biodiversity Act (Act 10 of 2004) including Threatened or Protected Species Regulations; • National Environmental Management Act (Act 107 of 1998); • Gauteng Nature Conservation Bill, 2014/Transvaal Nature Conservation Ordinance 12 of 1983; and • National Forests Act (Act 30 of 1998).				
Excavation	**4**	• The process of excavation and back filling must be carried out as a sequential process following one another as quickly as possible. • Excavations must only remain open for a minimum period of time and during this time they must be clearly demarcated. If excavations place the public at risk these sites must be fenced. • The residents directly affected by open trenches must be notified of the dangers. This will be done during the site-specific phase. • Danger tape shall not be utilised to prevent	All Contractors	Throughout construction	Visual inspection	• Daily site inspection. • Damage to the environment (sensitive environment)

		personnel from open excavations, orange nets should be used for all open excavations on site. Construction vehicles should avoid creating new roads, use existing roads. • Topsoil must be cleared and retained as it contains most inorganic matter and nutrients. • Harvested grass should be retained and used as a mulch to combat erosion. • Soil should be exposed for the minimum time possible once cleared of invasive vegetation. • Avoid prolonged exposure of soils to wind and water erosion when clearing and grubbing. • Stockpiled topsoil must be covered with suitable fabric to prevent erosion and weed invasion. • Stockpiled topsoil must be covered with suitable fabric to prevent erosion and weed invasion. • No vehicles are allowed to access onto the stockpiles after they have been placed. • Topsoil and subsoil must be kept separate throughout construction and rehabilitation. • A marsh wire or snow netting shall be erected around the exposed excavations to warn the public. • The contractor must rip and rehabilitate				

		temporal roads after project completion. • The Contractor shall be in possession of an emergency spill kit that must be complete and available at all times on site.				
Topsoil and subsoil	**5**	• The contractor should remove 150mm of topsoil and stockpile at a height of not more than 1m. • Topsoil should be temporarily stockpiled, separately from (clay) subsoil and rocky material, when areas are cleared. If mixed with clay sub-soil the usefulness of the topsoil for rehabilitation of the site will be lost. • Stockpiled topsoil should not be compacted and should be replaced as the final soil layer. No vehicles are allowed access onto the stockpiles after they have been placed. • Stockpiled soil should be protected by erosion-control berms if exposed for a period of greater than 14 days during the wet season. . • Topsoil stripped from different sites must be stockpiled separately and clearly identified as such. • Topsoil obtained from sites with different soil types must not be mixed. • Topsoil stockpiles must not be contaminated	All Contractors	During Vegetation clearance	Visual inspection	• Incident of incorrect storage and harvesting. • Manifestation of alien invasive plants. • Incident of erosions.

		with oil, diesel, petrol, waste or any other foreign matter, which may inhibit the later growth of vegetation and micro-organisms in the soil. • Soil must not be stockpiled on drainage lines or near watercourses without prior consent from the Project Manager. • Soil should be exposed for the minimum time possible once cleared of invasive vegetation, that is the timing of clearing and grubbing should be co-ordinated as much as possible to avoid prolonged exposure of soils to wind and water erosion. • Stockpiled topsoil must be either vegetated with indigenous grasses or covered with a suitable fabric to prevent erosion and invasion by weeds. • Limited vehicular access is allowed across rocky outcrops and ridges. • All cut and fill surfaces need to be stabilized with appropriate material or measures when major civil works are complete. • Erosion and donga crossings must be dealt with as river crossings. Appropriate soil erosion and control procedures must be applied to all embankments that are disturbed				

		and destabilized as per the Authorisation • All equipment must be inspected regularly for oil or fuel leaks before it is operated. Leakages must be repaired on mobile equipment or containment trays placed underneath immobile equipment until such leakage has been repaired. • Soil contaminated with oil must be appropriately treated and disposed of at a permitted landfill site or the soil can be regenerated using bio-remediation methods. • Runoff must be reduced by channelling water into existing surface drainage system.				
Protection of archaeological and heritage resources	**6**	• Alert the construction workforce of the potential existence of artefacts at the site. • Empower staff to stop works on (chance) discovery of artefacts at the site. • Cease construction on (chance) discovery of archaeological sites of heritage importance, or redirect machinery away from finds until an archaeologist is able to make a site inspection and establish the importance of the find and make recommendations for preservation and/or record keeping. • Report the presence of graves or human remains, fragments of fossil bone, ostrich egg	All Contractors/Johannesburg Water	• Before Construction commences • During earthworks	Visual inspection	• Discovery of possible archaeological material • Rescue and reporting of identified material when discovered

		and stone fragments to HWC. • Obtain a permit for the removal of artefacts from the site if any are discovered during construction.				
Protection of paleontological resources	**7**	• Identify a stand-by palaeontologist to inspect fossils if they are discovered during construction activities. • Empower staff to stop works on (chance) discovery of fossils at the site. • Alert the construction workforce of the potential existence of fossils at the site. • Cease construction on (chance) discovery of fossils and artefacts of paleontological importance or direct machinery away from finds until the identified palaeontologist is able to make a site inspection and establish the importance of the find and make recommendations for preservation, collection or record keeping.	Johannesburg Water All Contractors	Prior commencement During earthworks	Visual inspection	• Discovery of possible archaeological material. • Rescue and reporting of identified material when discovered.
Concrete / cement Work/Batching plant	**8**	• Use Ready-Mix concrete rather than batching where possible. • Ensure that no cement truck delivery chutes are cleaned on site. Cleaning operations are to take place off site at a location where wastewater can be disposed of in the correct manner. If this is not possible a suitable	All Contractors	Throughout construction	Visual inspection and JW EO/ECO approval.	• Number of incidents of batching outside works footprint; • Contaminati

		washing facility is to be developed on site in consultation with the ECO. • Concrete must be mixed only in an area demarcated for this purpose, ideally on an impervious surface (e.g. cement mixing pit). • Batching operations to take place in a designated area, which will be kept clean at all times. • All concrete spilled outside this area, must be promptly removed by the Contractor and taken to a permitted waste disposal site. • After all concrete mixing is complete; all waste concrete must be removed from the batching area and disposed of at an approved dumpsite. • Ensure separation of clean and dirty water from batching plant. • Storm water must not be allowed to flow through the batching area. Water laden with cement must be collected in a retention area for evaporation and not allowed to escape the batching area. • Operators must wear suitable safety clothing. • Wastewater from batching operations to be suitably disposed of.				on of water and soil; and • Visible litter / waste on site.

		• Waste concrete and cement sludge to be removed on a regular basis (to prevent overflowing) and to be disposed of at a suitable facility. • Unused cement bags will be stored in an area not exposed to the weather and packed neatly to prevent hardening or leakage of cement. • Used cement bags will be stored so as to prevent windblown dust and potential water contamination. Used bags will be disposed of adequately at a licenced waste disposal facility. • Limit concrete batching to single sites where possible. • Concrete transportation will not result in spillage. • Cleaning of equipment and flushing of mixers will not result in pollution, with all contaminated wash water entering the waste water collection system. • To prevent spillage onto roads, ready mix trucks will rinse off the delivery shoot into a suitable sump prior to leaving the site. The Contractor shall ensure such designated concrete wash bay area's/ sumps are created and that all concrete trucks delivering				

		concrete to site first empty and clean their shoots at this point before leaving the site. The dried waste product shall be handled as construction rubble. • Suitable screening and containment will be in place to prevent windblown contamination from cement storage, mixing, loading and batching operations. • All contaminated water and fines from exposed aggregate finishes will be collected and stored in sumps and will be adequately disposed of. • All visible remains of excess concrete will be physically removed on completion of the plastering or concrete pouring and disposed of in an acceptable manner. • Any spilled concrete to be cleaned up immediately. • In practice all wastes arising from construction activities are to be handled; transported and disposed of in accordance with the relevant regulations. All efforts should be made to minimise, reclaim or recycle waste, and failing that, dispose of it in a manner licensed by the government for that purpose.				
Water	**9**	• Con serve water wherever possible (e.g.	All	Throughout	Visual	• Incidence of

Management		ensure that areas are not watered excessively and all leaking pipes are replaced and repaired immediately). • Adequate sedimentation control measures must be instituted at any river crossings when excavations or disturbance of a riverbanks or riverbeds takes place. • Adequate sedimentation control measures must be implemented where excavations or disturbance of drainage lines of a wetland may take place. • All fuel, chemical, oil, etc. spills must be confined to areas where the drainage of water can be controlled. Use appropriate structures and methods to confine spillages such as the construction of berms and pans, or through the application of surface treatments that neutralise the toxic effects prior to the entry into a water course. • The drip tray and spill kit must be sued to contain oil from spilling into the water. • During construction through a wetland, the majority of the flow of the wetland should be allowed to pass downstream. • Vehicular traffic across wetland areas must be avoided.	Contractors	construction	inspection	stormwater contamination; • Visible leaks/ water wastage; And Visible surface erosion.

		• No dumping of foreign material in streams, rivers and/or wetland areas is allowed. • The wetland area and/or river must not be drained, filled or altered in any way including alteration of a bed and/or, banks, without prior consent from the DWS. The necessary licenses must be obtained in terms of Section 21 and 22 of the National Water Act, 36 of 1998 from DWS. • No fires or open flames are allowed in the vicinity of the wetland, especially during the dry season. • No swimming, washing (including vehicles and equipment), fishing or related activity is permitted in a wetland or river. • Disturbances to nesting, breeding and roaming sites of animals in or adjacent to wetland areas must be minimized.				
Air Pollution	**10**	• Speed limits must be implemented in all areas, including public roads and private property to limit the levels of dust pollution. • Dust must be suppressed on access roads and construction sites during dry periods by the regular application of water or a biodegradable soil stabilisation agent. Water used for this purpose must be used in	All Contractors	Throughout construction	Visual inspection	• Visible air pollution.

		quantities that must not result in the generation of run-off. • Where possible the use of potable water should be minimised for dust suppression purposes, preferably recycled or reused water. • The site-specific investigation will quantify the impact of dust on nearby wetlands, rivers and dams in terms of sedimentation. Mitigation measures identified during the site specific study must be implemented. • The Contractor must notify the Principal of all schools within 50m of the site of proposed activities. The Principal must in turn ensure that children with allergies and respiratory ailments take the necessary precautionary measures during the construction period. The Contractor must ensure that construction activities do not disturb school activities e.g. dust clouds may reduce visibility affecting sports activities. • Waste must be disposed of, as soon as possible at a municipal transfer station, skip or on a permitted landfill site. Waste must not be allowed to stand on site to decay, resulting in malodours.				

		• Noise control measures must be implemented. All noise levels must be controlled at the source. All employees must be given the necessary ear protection gear. IAP's must be informed of the excessive noise factors. • The Contractor must inform all adjacent landowners of any after-hour construction activities and any other activity that could cause a nuisance e.g. the application of chemicals to the work surface. Normal working hours must be clearly indicated to adjacent land owners. • No loud music is allowed on site and in construction camps. • No fires are allowed if smoke from such fires will cause a nuisance to IAPs.				
Social and cultural	**11**	• Access by non-construction people onto any construction sites must be restricted. The Contractors activities and movement of staff must be restricted to designated construction areas only. • The Contractors crew must be easily identifiable due to clothing, identification cards or other methods. • Rapid migration of job seekers could lead to	All Contractors	Throughout construction	Visual inspection	• Community complaints. • Complaints register. • Daily environmental inspection

		squatting and social conflict with resident communities and increase in social pathologies if not properly addressed. The Contractor must ensure that signs indicating the availability of jobs are installed. • Criteria for selection and appointment (by the Contractor) of construction labour must be established to allow for preferential employment of local communities. The Local Authority must be actively involved in the process of appointing temporary labourers. • Sub-Contractors and their employees must comply with all the requirements of this document and supporting documents e.g. the Contract document that applies to the Contractor. Absence of specific reference to the sub-contractor in any specification does not imply that the sub-contractor is not bound by this document. • No member of the construction workforce is allowed to wander around private property, except within the immediate surroundings of the site. • The Contractor must provide suitable sanitation facilities for site staff. Sanitation provided during the construction phase				

		should be managed so that it does not cause environmental health problems. The use of the surrounding veld for toilet purposes is not permitted under any circumstance. • The Contractor must arrange for all his employees and those of his sub-contractors to be informed of the findings of the environmental report before the commencement of construction to ensure: • A basic understanding of the key environmental features of the work site and environments, and • Familiarity with the requirements of this document and the site specific report. • Supervisory staff of the Contractor or his sub-contractors must not direct any person to undertake any activities which would place such person in contravention of the specifications of this document endanger his/her life or cause him/her to damage the environment. • The demand for construction materials and supplies will have an effect on the local economy. This impact can be optimised by sourcing and purchasing materials locally and regionally wherever possible, insofar as the				

		material complies with the design specification. • The Contractor must maintain a detailed complaints register. This must be forwarded, together with solutions, to the authorities when requested.				
Aesthetics	**12**	• Scenic Quality • Damage to the natural environment must be minimized. • The contractor may not remove any trees. If trees are in the way of the pipe route or with the development sites, the contractor must inform the environmental section who will then liaise with city parks for permission or recommendation. • Trees and tall woody shrubs must be protected from damage to provide a natural visual shield. Excavated material must not be placed on such plants and movement across them must not be allowed, as far as practical. • The clearing of all sites must be kept to a minimum and surrounding vegetation must, as far as possible, be left intact as a natural shield. • No painting or marking of natural features must be allowed.	All Contractors	Throughout construction	• Visual inspection. • Way-leaves	• Daily inspection • Environmental incident.

		• Above-ground Structures (reservoirs, water hammer tanks, valve chambers, pump stations etc.) • All above ground structures should be located in areas where the visual impact from roads, houses etc. is minimised. • All above ground structures could be treated or painted to blend in with the natural environment. • Cut and fill areas, river and stream crossings and other soil stabilisation works must be constructed to blend in with the natural environment. • Natural outcrops, rocky ridges and other natural linear features must not be bisected. Vegetation on such features must, as far as possible, not be cut unless absolutely necessary for construction. • Excavated material must be flattened (not compacted) or removed from site. No heaps of spoil material must be left on site once the Contractor has moved to a new construction site. • Any complaints from interest groups regarding the appearance of the construction site must be recorded and addressed promptly by the				

		Contractor.				
Fauna and Flora	**13**	**Flora** • All suitable and rare flora and seeds must be rescued and removed from the site. They must be suitably stored, for future use in rehabilitation. • The felling and/or cutting of trees and clearing of bush must be minimised. • Bush must only be cleared to provide essential access for construction purposes. • The spread of alien vegetation must be minimized. • Any incident of unauthorised removal of plant material, as well as accidental damage to priority plants, must be documented by the Contractor. • Woody vegetative matter stripped during construction must either be spread randomly throughout the surrounding veld so as to provide biomass for other micro-organisms and habitats for small mammals and birds, or it may be stockpiled for later redistribution over the reinstated top soiled surface. No vegetative matter must be burnt or removed for firewood other than those removed during the grubbing and clearing phase. Such	All Contractors	Throughout construction	• Visual inspection • Way-leave from City Parks. • Biodiversity permit from Gauteng Department of Rural and Developme nt	• Environment al incident register • Daily inspection • Number of environment al incident. • Fauna and flora removal and relocation register

		vegetation can be made available to the local inhabitants to be used as firewood. • No tree outside the footprint of the Works area must be damaged. **Fauna** • No species of animal may be poached, snared, hunted, captured or wilfully damaged or destroyed. • Snakes and other reptiles that may be encountered on the construction site must not be killed unless the animal endangers the life of an employee. • Anthills and/or termite nests that occur must not be disturbed unless it is unavoidable for construction purposes. • Disturbances to nesting sites of birds must be minimized. • The Contractor must ensure that the work site is kept clean and free from rubbish, which could attract pests.				
Infrastructure	**14**	• The relevant authorities must be notified of any interruptions of services, especially the Local Municipality, National Road Agency, Transnet, TELKOM and ESKOM. In addition, care must be taken to avoid damaging major	All Contractors	Throughout construction	• Visual inspection • Way-leaves from different	• Incident register. • Permit/ Way-leave register

		and minor pipelines and other services. • The integrity of property fences must be maintained. • No telephone lines must be dropped during the construction operations, except were prior agreement by relevant parties is obtained. All crossings must be protected, raised or relocated as necessary. • All complaints and/or problems related to impacts on man-made facilities and activities must be promptly addressed by the Contractor and documented. • Proper storage facilities should be provided for the storage of oils, grease, fuels, chemicals and hazardous materials. • The Contractor must ensure that accidental spillage does not pollute soil and water resources. • Fuel stock reconciliation must be done on all underground tanks to ensure no loss of oil, which could pollute groundwater resources. • Cement must be stored and mixed on an impermeable substratum. • The Contractor shall ensure that existing services (e.g. roads, pipelines, and powerlines and telephone services) are not damaged or			entities.	• Complaints register. .

		disrupted unless required by the contract and with the permission of the RE. • The Contractor shall be responsible for the repair and reinstatement of any existing infrastructure that is damaged or services which are interrupted. • A time limit for the repairs may be stipulated by the RE in consultation with the Contractor.				
Blasting	**15**	• Blasting must not endanger public or private property. • Noise mufflers and/or soft explosives must be used to minimize the impact on animals. • All the provisions of the Explosives Act, 26 of 1956 and the Minerals Act, 50 of 1991 must be complied with. • The Contractor must take measures to limit fly rock. • Certificate of competence. In file • Blasting permit must be obtained from the South African police station issued in terms of section 9 of explosive Act, Act 26 of 1956) prior blasting. • Method statement for drilling and blasting (NB: Submitted for acceptance before any works) in file • Provide the MSDS's for the chemicals are to	All Contractors	Throughout construction	Visual inspection/ Engineer report	• Incident register. • Complaints register. • Permit register.

		be used. • Proof of notification to the affected community. • The Appropriate PPE.				
Workshops, storage areas and materials handling	**16**	• These areas shall be chosen so as to cause the least impact on the biophysical and social elements of the area. • The siting of workshops, maintenance and refuelling sites and materials storage areas shall not be in the vicinity of sensitive sites e.g. wetlands, cultivated fields or drainage lines, or where local land owners can be disturbed. • Storm water shall be diverted around the storage area. Storm water falling on the storage area shall be discharged if it meets the required water quality standards. • Proper storage facilities, placed on an impermeable surface, shall be provided for the storage of oils, grease, fuels, chemicals and other hazardous materials to be used during the construction phase of the project. If fuel is required on site it shall be stored in a secure area in a steel tank supplied and maintained by the fuel suppliers. Leakage of fuel shall be avoided.	All Contractors	Throughout Construction	• Visual inspection • Method statement for handling hazardous substances. • MSDS	• Hazardous substances register. • MSDS file • Spill register • Incident register.

		• An adequate bund wall, 110% of volume, shall be provided for fuel and diesel areas to accommodate any spillage or overflow from these substances. The area inside the bund wall shall be lined with an impervious lining to prevent infiltration of the fuel into the soil. • In addition, hazard signs indicating the nature of the stored materials shall be displayed on the storage facility or container and Material Safety Data Sheets (MSDS's) will be made available for all hazardous chemicals. Before containers or storage facilities are erected, emergency procedures in the event of misuse or spillage that may negatively affect an individual or the environment will be in place. • The storage facilities (including any tanks) shall be surrounded by a bund wall, in order to ensure that accidental spillage does not pollute local soil or water resources. • The storage areas shall not be utilised for accommodation purposes and shall be access controlled. • The storage area shall be kept tidy and the area shall be rehabilitated after use. • An inventory of any hazardous chemicals/substances (including that within				

		equipment) kept on site, along with a description of possible ill effects and treatment of health-related afflictions resulting from accidents, shall be kept in the storage area as well as by the appropriate manager. These areas shall be securely fenced. • Gas welding cylinders and LPG cylinders shall be stored in a secure, well-ventilated area. • A notice board with the contact details of the responsible party shall be displayed at the gate to the storage area. • The contractor shall ensure that any delivery drivers are informed of all procedures and restrictions required to comply with the EMP. Someone with an adequate understanding of the CEMP shall supervise drivers during delivery and off-loading. • All vehicles and machinery will be inspected for any leaks or malfunctions regularly. Vehicle servicing or repairs is prohibited from site, unless in an emergency. • Drip trays shall be inspected and emptied daily and serviced when necessary. In particular drip trays shall be closely monitored during rain events to ensure that they do not				

		overflow. The contents must be disposed of at a recognised site. • All repairs done on machinery using hydrocarbons as fuels or lubricants shall have a drip tray placed strategically to avoid incidental spillage. • Workers shall be made aware of the health risks associated with any hazardous substances used (e.g. smoking near refuelling depots), and shall be provided with appropriate protective clothing / equipment in case of spillages or accidents. • Cement and other potential environmental pollutants shall be stored and mixed on plastic sheeting or ready mix trucks shall be used. There shall be no opportunity for environmental contamination. • Workshop areas shall be monitored for oil and fuel spills and such spills shall be cleaned and remediate to the satisfaction of the EO. • The Contractor shall be in possession of an emergency spill kit that must be complete and available at all times on site.				
Waste Management	**17**	Methods for waste management and waste minimisation shall be implemented from the outset of the contract as per the Waste	All Contractors	Throughout Construction	• Visual inspection/Environment	• Littering • Soil contaminatio

		Management Plan to be submitted to Client. All personnel shall be instructed to dispose of all waste in the proper manner. A waste avoidance and minimisation approach will be encouraged for the duration of the project. The following steps in order will be applied. • Prevention – avoid and minimise waste • Recycle – reuse and recover all general waste • Treat – treatment in order to reduce toxicity reduce waste quantities • Dispose – waste removal into a registered landfill facility **Solid waste** Waste with the potential for market re-use will be stored in separate containers, this includes, scrap metal, used tyres and paper. This waste will be recycled where ever possible. Solid waste shall be temporarily stored in tip – poof metal drums or waste skips at an approved area on site for collection and disposal. This area shall be away from drainage lines or water courses. • All general waste drums or skips will be appropriately labelled GENERAL WASTE • A refuse control system shall be established			al inspection checklist. • Legal Documents: Transport certificate obtained from GDARD for transporting general or hazardous waste. • Transport certificate obtained from City of Johannesburg for transporting general waste within COJ. • Waste manifest/	n • Water pollution.

		for the collection and removal of refuse to the satisfaction of Client and ECO. • No waste shall be burned at the site offices or anywhere else on the site. • All building rubble shall be a) removed from the site and disposed of at an appropriate dumping site, or b) temporarily stored in a clearly demarcated area on site for future use. • All waste shall be disposed at an appropriate waste disposal facility. **Litter** • No littering by construction workers shall be allowed. During the construction period, the facilities shall be maintained in a neat and tidy condition and the site shall be kept free of litter. • Measures shall be taken to reduce the potential for litter and negligent behaviour with regard to the disposal of all refuse. • Littering, discarding or burying of any materials shall not be allowed on site. **Hazardous waste**			waste disposal certificate/ weighbridge slip.	

		• Hazardous waste shall be temporarily stored in tip – poof metal drums or waste skips at an approved area on site for collection and disposal. This area shall be away from drainage lines or water courses. • All hazardous waste drums or skips will be appropriately labelled. **HAZARDOUS WASTE.** • Hazardous waste such as bitumen, tar and oil shall be disposed of at a registered waste disposal facility. Special care shall be taken to avoid spillage of tar products such as tar prime or pre-coating fluid to avoid water-soluble phenols from entering the ground or contaminating water. • All used filter materials shall be stored in a secure bin for disposal off site. Any contaminated soil shall be removed and replaced with clean soil. Soil contaminated by oils and lubricants shall be collected and disposed of at a facility designated by the local authority to accept contaminated materials. • Used oil, lubricants and cleaning materials from the maintenance of vehicles and machinery shall be collected in a holding tank				

		and returned to the supplier. Water and oil shall be separated in an oil trap. Oils collected in this manner shall be retained in a safe holding tank and removed from site by a specialist oil recycling company for disposal at an approved hazardous waste disposal site. Oil collected by a mobile servicing unit shall be stored in the service unit's sludge tank and discharged into the safe holding tank for collection by the specialist oil recycling company. • Sludge should be managed in accordance with the Sludge Guideline 2010. • Sludge should be kept only at the drying bed and no sludge should be stored at a permeable ground or natural ground. • Hazardous waste shall be disposed of at a registered hazardous waste disposal site, disposal certificates shall be kept in the site file for record. **Medical Waste** • All medical waste will be contained in the special bins provided. All sharp needles must be separated from other medical waste, • All out dated and disused medicines will be				

		disposed of as a hazardous medical waste or returned to the supplier for disposal. (Tablets and syrups will be crushed and/or dissolved before disposal as hazardous waste), • Medical waste used on personnel coming for treatment at the clinic are to be placed on a demarcated container storage room, • The Occupational Health Nurse will notify a service provided for removal of the medical waste prior exceeding 90 days. • The service provider to provide Waste Manifest as well as the Safe Disposal Certificate, to the OHN who will maintain the copies of the waste manifest and safe disposal certificate. • The OHN will arrange for an approved hazardous waste disposal company to collect and dispose of this medical waste. The OHN is responsible for and authorised to keep all records in connection herewith (disposal certificates).				
Ablution facilities	**18**	• Provide ablution facilities (i.e. chemical toilets) for all site staff at a ratio of 1 toilet per 15 workers (absolute minimum 1:25).	All Contractors	Throughout construction	• Visual inspection • Records of	• Incidence of staff not using

		• Secure all temporary/portable toilets to the ground within the Site Camp to the satisfaction of JW EO/ECO to prevent them toppling due to wind or any other cause. • Maintain toilets in a hygienic state (i.e. toilet dispensers to be provided, toilets to be cleaned and serviced regularly (by registered appropriate waste contractor), and toilets to be emptied before long weekends and builders' holidays). • Remove/ appoint an appropriate supplier to remove accumulations of chemicals and treated sewage from the site and dispose of at an approved waste disposal site or sewage plant. • Ensure that no spillages occur when the toilets are cleaned or emptied. Repeated incidents of spillage of chemicals and or waste (i.e. more than one incident), will require toilets to be placed on a solid base with a sump. • Ablution facilities must be located at least 50m from any watercourse. • Ablution facilities shall be provided on site. • The positioning of the ablution facilities shall be done in consultation with Client and shall be placed so that it cannot contaminate the			waste manifest/disposal certificates/ weighbridge slip	Facilities • Incidence of pollution

		natural streams and rivers. One toilet shall be provided per 10 staff members on site. Toilets shall be positioned within walking distance of wherever employees are employed on the site. Toilets shall be provided with locks and doors shall be secured to prevent the toilets from blowing over. • The toilets shall be placed outside of areas susceptible to flooding. • Chemical toilets shall be serviced regularly by an authorised service provider and removed to a registered waste water treatment works and disposal certificates shall be obtained from the waste disposal facility for each disposal and retained on site. • Polluted run-off must be discharged in the local sewerage main and not overland or into public streams. In instances where a sewerage main is not available, polluted run-off will be collected in sub-surface tanks and a reputable effluent removal contractor will be contracted to dispose of the waste in an environmentally acceptable manner. Official documentation shall be obtained from the waste disposal facility for each disposal and retained on site.				

		• Toilets situated close to the site boundaries or within sight of residential areas shall be hidden behind screens or other cover as approved by the Engineer; • Discharge of waste from toilets into the environment and burial of waste is strictly prohibited;				
Access road and traffic control	**19**	**Access Roads** • The Contractor and the affected landowner must collaborate on the planning and construction of new access routes and the repair or upgrading of existing routes. • Access to the site must be controlled such that only vehicles and persons directly associated with the work gains access to the site. • Temporary access roads must not be opened until required and must be restored to its former state as soon as the road is no longer needed. **Traffic Control** • All reasonable precautions must be taken during construction to avoid severely interrupting the traffic flow on existing roads, especially during peak periods. • Before any work can start the Local Traffic	All Contractors	Throughout construction	• Method statement for access road and traffic control. • Way-leave	• Daily Inspection checklist. • Environmental incident. • Incident register.

		Department must be consulted about measures to be taken regarding pedestrian and vehicular traffic control.				
Electrical	**20**	• Measures must be taken during thunderstorms to protect workers and equipment from lightning strikes. • All tall structures must be properly earthed and protected against lightning strikes.	All Contractors	Throughout construction	• Permit • OHS approval letter • Way-leave	• Approval letter • Electrical certificate
Development Footprint	**21**	• The development footprints and disturbed areas surrounding the proposed project infrastructure should be kept at minimum as possible and the areas cleared of natural vegetation and topsoil must be kept to a minimum; • The extent of all development footprint areas and permanent/ temporary structures must be limited to what is essential; • As far as possible, existing roads are to be utilised, to limit cumulative impacts from roads and traffic; • The height of any temporary structures such as topsoil stockpiles should be kept as low as possible below 1m.	All Contractors	Throughout construction	• Agreement letter. • Way-leave	• Incident register. • Complaints register.
Fire Prevention	**22**	• The Contractor must take all the necessary precautions to protect the materials on site	All Contractors	Throughout construction	• Visual inspection	• Fire extinguisher

		and to avoid veld fires. • No fires or open flames are allowed on site unless directly used for construction purposes, • Review all SANS standards relating to fire precautions and fire control namely, SANS 0131-3 Section 8 and SANS 089-1 or as amended. • The Contractor must have fire-fighting equipment and a first aid box available on site and on all vehicles working on site. • All waste bins must be kept away from fuel tank installations. • All fuel tanks must be installed above ground, depending on the volume of stored fuel, for easy detection of fuel leaks. • Any welding or other sources of heating of materials must be done in a controlled environment, wherever possible and under appropriate supervision, in such a manner as to minimise the risk of veld fires and/or injury to staff. • Fires lit for comfort (warmth) must be actively discouraged by the Contractor, due to the risk of veld fires and the risk to adjacent properties. Also, no waste material must be burnt.			• Emergency Response Plan.	inspection checklist. • Incident register • Mock drill report.

Noise Pollution	**23**	• Temporary noise pollution due to construction works should be controlled by proper maintenance of equipment and vehicles, and tuning of engines and mufflers. Construction works should be completed in as short a period as possible by assigning qualified engineers and foremen. • It is the responsibility of the Contractor to monitor for the mitigation of such impacts. Noise problems should be reduced to normally acceptable levels by incorporating low-noise equipment in the design and/or locating such mechanical equipment in properly acoustically lined buildings or enclosures. In the presence of adequate buffer zones between the facility and residential areas, noise control measures must be minimized.	All Contractors	Throughout Construction	Random noise measurements	• Results of random noise measurements • Number of registered complaints
Complaints	**24**	Maintain a complaints register for all complaints. The register must list: • Complainant name and contact details; • Date complaint was lodged; • Person who recorded the complaint; • Nature of the complaint; • Actions taken to investigate the complaint and • outcome of the investigation;	All Contractors	Throughout construction	Complaints register	• Availability of register on site • Designated person to maintain register • Complaints

		• Action taken to remedy the situation; • Date on which feedback was provided to complainant.				logged • Complaints followed up and Closed out.
Housekeeping	**25**	• All construction and operational areas must be kept in a neat and orderly condition at all times; • An efficient removal system of waste and rubble must be ensured during all development phases; • All operational facilities, including vehicles, should be actively maintained; • Any areas for material storage, waste sorting and other potentially intrusive activities must be screened from view as far as considered feasible. • Regularly inspect all construction machinery and holding tanks for leaks or damages. • Place generators on drip trays. • Repair any defects as soon as possible. In the case of leaks, ensure that the leaking water or effluent is captured and not released into the environment. • Service and refuel equipment that uses hydrocarbon fuels, oils, lubricants and other	All Contractors	Throughout	Visual inspection of site camp/ construction site	Regular inspection reports by SHE Officer and JW EO

		hazardous chemicals at the designated area at the Site Camp only under conditions approved by JW EO/ECO • Ensure that absorbent pads (or equivalent) and/ or drip trays are available to collect any oil, fluid, etc. in the case of a breakdown or emergency repair outside the designated area. Keep a copy of fuels and hazardous substance inventory on site. • Keep spill containment and clean-up equipment at all work sites and for all polluting materials used at the site. • Prevent discharge of any hazardous substances or pollutants, such as cements, concrete, chemicals, and other contaminated waste water and fuels into the ground, surface or stormwater systems on site. • Control litter and keep construction areas as clean and neat as possible.				
Transportation and refuelling	**26**	• Undertake regular maintenance of vehicles and machinery to identify and repair minor leaks and prevent equipment failures. • Undertake any on-site refuelling and maintenance of vehicles/machinery in designated areas. Line these areas with an impermeable surface and install oil traps.	All Contractors	Throughout Construction	Visual inspection of vehicles, barges, machinery and refuelling / maintenance	• Incidence of non-compliance • Incidence of leaks and spills • Cost of

		• Ensure that oils and lubricants used for maintenance of equipment in the field are correctly contained. • Use appropriately sized drip trays for all refuelling and/or repairs done on machinery – ensure these are strategically placed to capture any spillage of fuel, oil, etc. • Use drip trays under all equipment and plants that are parked overnight or for long periods. • Store and handle fuels, oils and chemicals so as to avoid the risk of spillage, i.e. in waterproof and impervious			areas	cleaning up spills
Safety and Security	**27**	• Do not allow any open fires on the site. • Do not allow smoking on the site except within designated areas. Suitable fire-fighting equipment must be readily available in these areas. • Equip all fuel stores and waste storage areas with fire extinguishers. • Ensure that all personnel on site are aware of the location of fire-fighting equipment on the site and how the equipment is operated. • Suitably maintain fire-fighting equipment. • Ensure that emergency procedures (in relation to fire, spills, contamination of the ground, accidents to employees, use of hazardous	All Contractors	Throughout construction	• Inspect attendance register for training sessions • Inspect fire extinguishers and certificates	• Number of fire incidents • Certified extinguishers in appropriate locations
			All	Before and during	Visual inspection	Number of

		substances, etc.) are established prior to commencing construction. • Make all emergency procedures available, including responsible personnel, contact details of emergency services, etc. to all the relevant personnel. Clearly demarcate emergency procedures at the relevant locations around the site. • Secure the Site Camp, particularly to restrict • Unauthorised access to fuels and other hazardous substances. • Provide suitable emergency and safety signage on site, and demarcate any areas which may pose a safety risk (including hazardous substances, deep excavations, etc.). • Advise the ECO of any emergencies on site, together with a record of action taken.	Contractors	construction		safety / emergency incidents.
Response to environmental pollution	**28**	• In the event of environmental pollution, e.g. through spillages, immediately stop the activity causing the problem. • Maintain relevant Material Safety Data Sheets (MSDS) at the site for all potentially hazardous substances (as defined in the regulations for hazardous chemical substances). In the event of an emergency, procedures detailed in the MSDS shall be followed. Clean up any spills	All Contractors	Throughout construction	• Maintain register of pollution events and response • Following resumption of activities, frequently	• Number of incidents • Time activities stopped • Number of recurring Incidents • Availability

		immediately, through containment and removal of free product and appropriate disposal of contaminated soils. • Immediately remediate and rehabilitate areas in the event of a spill of an environmentally hazardous substance. • Only resume activity once the problem has been stopped or (in the case of spillages) the pollutant can be captured without reaching the environment. Repair faulty equipment as soon as possible. • Treat hydrocarbon spills, e.g. during refuelling, with adequate absorbent material, which then needs to be disposed of at a suitable landfill. • Ensure a quantity of appropriate remedial agent, capable of containing and/or remediating a hydrocarbon spill is available on site at all times in case of an emergency spill. The material shall be capable of handling a spill of at least 200l. • Report all fuel, oil or hydraulic fluid spills to the JW EO/ECO so that appropriate clean-up measures can be implemented. • Report all incidents within 24 hours to JW environmental section.			inspect repaired equipment to ensure proper functioning	and 70completeness of register
Storm Water	**28**	**Objective**	All	Throughout	• Visual	• Daily

Management		• To minimise erosion of soil from site during construction. • To minimise deposition of soil into drainage. • Minimise loss of vegetation cover due to construction related activities. **Mitigation Measures** • Identify and demarcate construction areas for general construction work and restrict construction activity to these areas. Prevent unnecessary destructive activity within construction areas (prevent over-excavations) • Stockpile topsoil for re-use in rehabilitation phase. Maintain stockpile shape and protect from erosion. All stockpiles must be positioned at least 50 m away from drainage lines and wetlands. • Erosion control measures: Run-off control and attenuation on slopes (sand bags, logs), silt fences, storm water channels and catch-pits, shade nets, soil binding, geofabrics, hydro seeding or mulching over cleared areas. • Control depth of excavations and stability of cut faces/sidewalls. • Compile a comprehensive storm water management plan as part of the final design of	Contractors	Construction	inspection. • Storm water management Plan. • Way-leave from JRA	inspection checklist. • Incident register.

		the project and implement during construction and operation.				
Re-vegetation and Rehabilitation or Reinstatement	**29**	**Objective** To ensure re-vegetation and rehabilitation of disturbed areas is undertaken **Legislation and Standards** Conservation of Agricultural Resources Act (Act 43 of 1983 Environment Conservation Act (Act 73 of 1989 National Forestry Act (Act 84 of 1998 National Environmental Management Act 107 of 1998 and Gauteng Nature Conservation Bill, 2014. **Mitigation measures** In order to meet this goal, the following objective, actions and monitoring requirements are relevant: • Disturbed areas must be rehabilitated/re-vegetated with appropriate natural vegetation and/or local seed mix. Re-use native/indigenous plant species removed from disturbance areas in the rehabilitation phase as per the re-vegetation and rehabilitation management plan. • Re-vegetated areas may have to be protected from wind erosion and maintained until an	All Contractors	Throughout Construction	• Rehabilitation Plan • JW EMP • Visual inspection • Ecologist Specialist report • Environmental Authorisation/GA • Practical and completion certificate. • Community Happy Letters.	• Daily inspection checklist. • Rehabilitation report • Waste management collection report (Waste Disposal Certificate).

		acceptable plant cover has been achieved. • On-going alien plant monitoring and removal within the disturbed project footprint (where the initial clearing for construction took place) must be undertaken on all areas of natural vegetation on an annual basis. • All temporary facilities, equipment and waste materials must be removed from site and appropriately disposed of. • All temporary access road must be rehabilitated to their original condition • Necessary drainage works and anti-erosion measures must be installed, where required, to minimise loss of topsoil and control erosion. • On-going inspection of rehabilitated areas in order to determine effectiveness of rehabilitation measures implemented. • On-going alien plant monitoring and removal should be undertaken as per the approved Rehabilitation/Re-vegetation plan. **Management and Mitigation Requirement** • Conduct a detailed search of at the area. As a minimum, this should take place				

		during the spring and summer months prior to impoundment so positive identification of flowering plants can be made. This should be done taking due cognisance of specialist studies already undertaken as part of the EIA process; • Allow time for additional searches if these are deemed necessary, based on progress and diversity of plant species found; • Identify and physically mark all conservation worthy plants found on the ground; and • Capture markers and reference in a retrievable system, so that these can be located again for transplanting (e.g. using a combination of aerial photography, GPS and GIS, as appropriate).				
Practical and Final completion inspection	**30**	• Ensure that practical inspection is conducted before the Contractor handover project back to JW in order to ascertain if the reinstatement or rehabilitation has been done accordingly. • The snag list is compiled and accepted by both parties (JW CAPEX Representatives and Contractor) • All responsible personnel including	CAPEX/ OHSE& DM/ All Contractors	During the final stage of project	• Meeting invite • Visual inspection	• Meeting invite • Attendance register • Snag list • Signed practical and final completion

		Environmental representative sign both practical and final completion letter.				inspection letter.
Final close out report	**31**	• Conduct final audit on site. • EO must ensure that audit reports are signed by RE/Engineer and Contractor. • Environmental File is returned to JW.	OHSE & DM	During the final stage of project.	• Final audit report. • Signing of Audit reports.	• Final Audit report. • Signed Audit report. • Environmental file.

Table 3: Environmental Management and Mitigation Measures that must be implemented during the Operational Phase

Operational Phase Measures						
Aspects	**ID**	**Mitigation Measure/Procedure**	**Responsible**	**Implementation Timeframe**	**Monitoring Methods**	**Performance indicators**
Waste Management	**1**	Sanitation Facilities • Ablution facilities shall be provided on site. • The positioning of the ablution facilities shall be done in consultation with Client and shall be placed so that it cannot contaminate the natural streams and rivers. One toilet shall be provided per 15 staff members on site. Toilets shall be positioned within walking distance of wherever employees are employed on the site. Toilets shall be provided with locks and doors shall be secured to prevent the toilets from	Johannesburg Water	During operation and maintenance activities	• Visual inspection of Waste collection and disposal areas. • Visual inspection of site. • Check waste disposal slips. • Monitor	• Presence of litter • Availability of waste bins and skips. • Degree to which rubbish bins and skips are filled • Total volume of general and hazardous waste storage capacity

		blowing over. • The toilets shall be placed outside of areas susceptible to flooding. • Chemical toilets shall be serviced regularly by an authorised service provider and removed to a registered waste water treatment works and disposal certificates shall be obtained from the waste disposal facility for each disposal and retained on site. • Polluted run-off must be discharged in the local sewerage main and not overland or into public streams. In instances where a sewerage main is not available, polluted run-off will be collected in sub-surface tanks and a reputable effluent removal contractor will be contracted to dispose of the waste in an environmentally acceptable manner. Official documentation shall be obtained from the waste disposal facility for each disposal and retained on site. • Any cooking on Site shall be done on well-maintained gas cookers with fire extinguishers present. No cooking shall be permitted to occur on open fires. • Toilets situated close to the site boundaries or within sight of residential areas shall be hidden behind screens or other cover as approved by			activities against JW Waste Management Plan. • Waste Inventory Register.	• Total volume of general and hazardous waste stored on site • Degree to which different waste is separated. • Frequency of waste collection. • Total volume of recycled and reused waste.

		the Engineer; • No spillage shall occur when the toilets are cleaned or emptied and the contents shall be properly stored and removed from Site. • Discharge of waste from toilets into the environment and burial of waste is strictly prohibited; • All building rubble and rubble from the demolished structures, solid and liquid waste must be disposed of as necessary at an appropriately licensed refuse facility. • Ensure that no refuse wastes are burnt on the premises or on surrounding premises. No fires will be allowed on site. **Contaminated water** •Workshops, refuelling depots and washing areas shall be bunded. •Any wastewater or spilled fuel collected within bunded areas around the refuelling area shall be disposed of as hazardous waste •Waste water containing hydrocarbons, paints oil etc. shall be treated as hazardous waste				
Protection of Vegetation	**2**	• Limit the footprint of the maintenance and operational activities to the minimum to minimise environmental damage.	Johannesburg Water	• During operation and	Visual inspection	• Incidents of vegetation damage.

		• Designate vegetated areas outside the development footprint as "No go" areas. • Limit the off-road driving within the Johannesburg Water Sites. • Protected or endangered species of plants shall not be removed unless they are interfering with a structure. • All trees and vegetation cleared from the site shall be cut into manageable lengths. • Big trees with large root systems shall be cut manually and removed, as the use of a bulldozer will cause major damage to the soil when the root system are removed. • Stumps shall be treated with herbicide. • Protected or endangered species of plants shall not be removed unless they are interfering with a structure. • Where such species have to be removed due to interference with a structure, the necessary permission and permits shall be obtained from Provincial Department of Agriculture and Rural Development. • All protected species not to be removed must be clearly marked and such areas fenced off if required. • The use of herbicides shall only be allowed		maintenance activities/. • When is necessary.		• Number of incidents of disturbance of vegetation outside site boundary.

		after a proper investigation into the necessity, the type to be used, the long-term effects and the effectiveness of the agent. • No scalping shall be allowed on any part of Johannesburg Water Sites.				
Alien invasive/weeds control	**3**	• Some of the areas of JW area are covered with moderate to very dense invasive alien shrubs and trees. Clearing of such vegetation will be necessary to gain access .However, clearing of this vegetation from the entire project area as far as possible will reduce the re-establishment rate of this vegetation over time, and will thus not only benefit the environment put also the proposed project and potential future phases of the project in the long term. • The type of invasive, however, will require regular follow-up eradication of seedlings after clearing, as extensive seed-banks of these species are present underneath present infestations. • Wood from alien vegetation can be used. However, care must be taken not to leave any of the leaf- or seed material on the site where the vegetation was cleared. Rather, identify a particular area that no longer has any indigenous vegetation, demarcate that area	Johannesburg Water	During operation and maintenance activities	• Visual inspection. • Monitoring against Vegetation Management Plan. • PCO certificate.	• Daily inspections register. • Incident register.

		and dump excess material of alien species there. • Once the material is sufficiently dry, it should be burned to destroy any regenerating capacity of stems and roots as well as seeds. • Only registered PCO with Certificate for competency to handle the hazardous substances (e.g. Herbicides) is allowed to use herbicide. • Only environmental friendly herbicide is allowed within JW sites. • MSDS for the herbicides must be kept in the storage area. • Method Statement for applying and handling herbicides and Risk Assessment for applying and handling herbicides. • Appropriate PPE for handling herbicides. • Herbicides stored only in a designated storage. • Empty containers of herbicides disposed of accordingly to the registered hazardous landfill site. • Proof of disposal provided to JW Environmental Section.				
Sludge Management	**4**	• The sludge must be managed according to the sludge guideline. • All agreements or Contract must be placed in	Johannesburg Water/Bulk Waste	During operations activities	• Visual inspection according to	• Sludge test report • Complaints register.

		the file. • The sludge must be kept on a designated bunded drying bed.			Sludge SOP. • Monitoring against Sludge Guideline. • Monitoring against WUL.	• Sludge spill register. • Environmental Officers Internal WUL Audit Report.
Workshop and storage Area	**5**	• The siting of workshops, maintenance and refuelling sites and materials storage areas shall not be in the vicinity of sensitive sites e.g. wetlands, cultivated fields or drainage lines, or where local land owners can be disturbed. • Storm water shall be diverted around the storage area. Storm water falling on the storage area shall be discharged if it meets the required water quality standards. • Proper storage facilities, placed on an impermeable surface, shall be provided for the storage of oils, grease, fuels, chemicals and other hazardous materials to be used during the construction phase of the project. If fuel is required on site it shall be stored in a secure area in a steel tank supplied and maintained by the fuel suppliers. Leakage of fuel shall be avoided. • An adequate bund wall, 110% of volume, shall be provided for fuel and diesel areas to	Johannesburg Water	During operations and maintenance activities	• Visual inspection • SOP for handling hazardous substances. • MSDS register	• Workshop and storage register. • MSDS register. • Incident register.

		accommodate any spillage or overflow from these substances. The area inside the bund wall shall be lined with an impervious lining to prevent infiltration of the fuel into the soil. • In addition, hazard signs indicating the nature of the stored materials shall be displayed on the storage facility or container and Material Safety Data Sheets (MSDS's) will be made available for all hazardous chemicals. Before containers or storage facilities are erected, emergency procedures in the event of misuse or spillage that may negatively affect an individual or the environment will be in place. • The storage facilities (including any tanks) shall be surrounded by a bund wall, in order to ensure that accidental spillage does not pollute local soil or water resources. • The storage areas shall not be utilised for accommodation purposes and shall be access controlled. • The storage area shall be kept tidy and the area shall be rehabilitated after use. • An inventory of any hazardous chemicals/substances (including that within equipment) kept on site, along with a description of possible ill effects and treatment				

		of health-related afflictions resulting from accidents, shall be kept in the storage area as well as by the appropriate manager. These areas shall be securely fenced. • Gas welding cylinders and LPG cylinders shall be stored in a secure, well-ventilated area. • A notice board with the contact details of the responsible party shall be displayed at the gate to the storage area. • All vehicles and machinery will be inspected for any leaks or malfunctions regularly. Vehicle servicing or repairs is prohibited from site, unless in an emergency. • Drip trays shall be inspected and emptied daily and serviced when necessary. In particular drip trays shall be closely monitored during rain events to ensure that they do not overflow. The contents must be disposed of at a recognised site. • All repairs done on machinery using hydrocarbons as fuels or lubricants shall have a drip tray placed strategically to avoid incidental spillage. • Workers shall be made aware of the health risks associated with any hazardous substances used (e.g. smoking near refuelling depots), and				

		shall be provided with appropriate protective clothing / equipment in case of spillages or accidents. • Cement and other potential environmental pollutants shall be stored and mixed on plastic sheeting or ready mix trucks shall be used. There shall be no opportunity for environmental contamination. • Workshop areas shall be monitored for oil and fuel spills and such spills shall be cleaned and remediate to the satisfaction of the EO. • The site shall be in possession of an emergency spill kit that must be complete and available at all times on site.				
Complaints	**6**	• Maintain a complaints register for all complaints. The register must list: • Complainant name and contact details; • Date complaint was lodged; • Person who recorded the complaint; • Nature of the complaint; • Actions taken to investigate the complaint and outcome of the investigation; • Action taken to remedy the situation; • Date on which feedback was provided to complainant.	Johannesburg Water	During operations and maintenance activities	• Complaints register. • GDARD complaints reference number.	• Availability of register on site • Designated person to maintain register • Complaints logged • Complaints followed up and closed out.
Collection of	**7**	• Water sampling shall be undertaken at the	Johannesburg	During	• Visual	• Daily water

water sample		selected sampling points as per the WUL. • Any incident or non-compliance with the WUL parameters or DWS Water Quality Guidelines shall be reported accordingly and investigated • Unused sampling bottle shall be disposed of accordingly.	Water/CDYNA	operation activities	inspection. • Online Lab reports	sample report. • Incident register.
Environmental Incident reporting and Emergency Response and Preparedness	**8**	• NEMA Section 30 and 30A emergency incidents and situations must be reported to GDARD or DEA immediately after as an incident or situation occurs. NWA Section 20 emergency must be reported to DWS, mostly by Operations Department. This can be done via phone, fax or email. JW must implement measures to contain the incident or situation immediately. Thereafter the Emergency Incident Report (EIR) or Emergency Situation Report (ESR) must be submitted to the authorities ASAP. The reports must provide as much information as possible, if not; the reports can be updated later as the investigation progresses. Not reporting an incident could result in the authorities issuing a directive or a compliance notice to the responsible person. • Important Note: For Section 30A Emergency Situation, an oral or written directive must be	Johannesburg Water Sites	During operation and maintenance activities.	• Visual inspection. • Flash report/ Incident investigation report. • Section 30A Annexure A. • JW Environmental Emergency Preparedness and Response Procedure.	• Incident register • Bioremediation report. • Section 30A Directive. • Corrective Action Plan

		obtained from GDARD or DEA before works can be undertaken in the watercourse to avoid undertaking listed activities without obtaining EA. • Johannesburg Water takes responsibility in order to effectively respond to emergency incidences such as fire, hydrocarbon and sewer spills or leakages, disturbance of wildlife and archaeological artefacts. The SHE Rep must conduct daily inspections to ensure that the required equipment needed to handle environmental incidents/ emergencies are readily available and in working condition. Quick response to an incident prevents escalation to an emergency:				
9. Water Management • **Water is a scarce resource and water shall be conserved wherever possible.** • **Improved and protected watercourses to Class C classification which is moderately modified in terms of determined class of water resource and resource quality objectives of chapter 3 (Part 2) of National Water Act (Act 36 of 1998).** • **Demand reduction/ Alternative sources.** • **Building a water sensitive city.** • **Well managed and maintained water infrastructure networks.**						
Water Usage	**9.1**	• The site must be kept tidy and hygienic at all times with special reference to sanitation & water management.	Johannesburg Water Sites	During operation	• Visual inspection • Meter readings	• • Records of Monthly water Usage.

		• Maintain a monthly water usage. • Reporting of water pipe burst and damaged meters				
Reduce water demand	**9.2**	• Implement effective demand-side management practices while exploring investment into smart infrastructure and alternative supplies to increase levels of net water savings. • Establish Task Team with different law enforcement agencies to develop and implement solution for infrastructure abuse problem. • Promote the implementation of Sustainable Urban Drainage System practice.	Johannesburg Water (Network)	During operation	• Monthly Monitoring • Monthly water management report	• Records of percentage reduction on non-revenue water. • Records of Percentage reduction of Rand Water system input volume.
Incentivise water saving interventions across domestic and economic sector users.	**9.3**	• Implementation of command and control base mechanism that promote water saving (CoJ By-laws). • Implementation of incentives base mechanism • Develop partnerships beyond the City to encourage water savings. • Expand current CoJ drought policy to build greater resilience of the water system. • Integrate water conservation requirements in conditions of planning approval.	Johannesburg Water ()	CoJ/Operations	• Monthly water management report	• Records of reduction in annual water consumption per capita • Water from alternative sources as % of total water

		• Develop an awareness and communications campaign using available technology.				supply
Rehabilitation/ Reinstatement	**10**	• Clean up and remove any spills and contaminated soil in the appropriate manner. • Ensure that no discarded materials are buried on site or on any other land not designated for this purpose. • Rehabilitate any disturbed areas as soon as maintenance or construction in the area is complete. • If disturbed areas are left to rehabilitate naturally, they must be frequently monitored and interventions put in place immediately should it become necessary. Special attention must be given to the potential for soil erosion and the associated environmental degradation. It is also essential to undertake alien vegetation control and management.	Johannesburg Water	During operation and maintenance activities	• EO compliance monitoring. • Visual inspection. • Compliance inspection against rehabilitation plan. • JW EMP.	• Inspection report. • Audit report by External Auditor. • Photos before and after.

6.1 Method Statement

The objective is to ensure all construction activities are undertaken with the appropriate level of environmental awareness to minimise environmental risk.

The environmental specifications are required to be underpinned by a series of Method

Statements, within which the Contractors and Service Providers are required to outline how any identified environmental risks will practically be mitigated and managed for the duration of the contract, and how specifications within this EMPr will be met. That is, the Contractor will be required to

describe how specified requirements will be achieved through the submission of written Method Statements to Johannesburg Water Environmental Section and ECO.

A Method Statement is defined as “a written submission by the Contractor in response to the environmental specification or a request by the Site Manager, setting out the plant, materials, labour and method the Contractor proposes using to conduct an activity, in such detail that the Site Manager and Environmental Officers are able 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 must cover applicable details with regard to:

- Construction procedures
- Materials and equipment to be used
- Getting the equipment to and from site
- How the equipment/material will be moved while on-site
- How and where material will be stored
- The 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
- Compliance/non-compliance with the Specifications, and
- Any other information deemed necessary by the Johannesburg Water.

The Contractor may not commence the activity covered by the Method Statement until it has been approved by the Site Manager, except in the case of emergency activities and then only with the consent of the Site Manager. Approval of the Method Statement will not absolve the Contractor from their obligations or responsibilities in terms of their contract.

Failure to submit a method statement may result in suspension of the activity concerned until such time as a method statement has been submitted and approved. The EO and ECO should monitor the construction activities to ensure that these are undertaken in accordance with the approved Method Statement.

Monitoring

- Regular inspections of the site by EO/SHE.
- Immediate reporting of ineffective sediment control systems.
- Public complaints register must be developed and maintained on site.

Monitoring Program

OBJECTIVE: Monitor the performance of the control strategies employed against environmental objectives and standards

A monitoring programme must be in place not only to ensure conformance with the EMP, but also to monitor any environmental issues and impacts which have not been accounted for in the EMPr that are, or could result in significant environmental impacts for which corrective action is required. The period and frequency of monitoring will be stipulated by the environmental authorisation (once issued). Where this is not clearly dictated, Johannesburg Water will determine and stipulate the frequency of monitoring required in consultation with the relevant authority. The contractor project manager will work with the site manager of the contractor to ensure that monitoring is conducted and reported.

The aim of the monitoring and auditing process would be to routinely monitor the implementation of the specified environmental specifications, in order to:

- Monitor and audit compliance with the prescriptive and procedural terms of the environmental specifications.
- Ensure adequate and appropriate interventions to address non-compliance.
- Ensure adequate and appropriate interventions to address environmental degradation.
- Provide a mechanism for the lodging and resolution of public complaints.
- Ensure appropriate and adequate record keeping related to environmental compliance.
- Determine the effectiveness of the environmental specifications and recommend the requisite changes and updates based on audit outcomes, in order to enhance the efficacy of environmental management on site.
- Aid communication and feedback to authorities and stakeholders.

Method of Monitoring

The Environmental Officer will ensure compliance with the EMP, and will conduct monitoring activities. The EO will undertake site inspections on a monthly basis or as specified in the environmental authorisation once issued.

6.2 Monitoring Reports

Environmental Monthly reports will be compiled by the EO on a monthly basis and must be submitted to Environmental Specialist. The report should include details of the activities undertaken in the reporting period, any non-conformances or incidences recorded, corrective action required and details of these non-conformances or incidents which have been closed out.

A document handling system must be established to ensure accurate updating of EMP documents, and availability of all documents required for the effective functioning of the EMP. Supplementary EMP documentation could include:

- Method Statements;
- Environmental Action Plan
- Environmental File Site instructions;
- Emergency preparedness and response procedures;
- Record of environmental incidents;
- Non-conformance register
- Training records;
- Site inspection reports;
- Waste Register
- Water Usage Register
- Fauna and Flora Register
- Hazardous chemical Inventory list
- Monitoring reports;
- Auditing reports; and
- Public complaints register (single register for maintained for overall site).

Table 4: Monitoring Programme

ISSUE	FREQUENCIES OF MONITORING	RESPONSIBLE PERSON
WATER		
Prevention of water pollution Prevention of stagnant water on site. Proper functioning of sanitation facilities	Weekly in rainy season Weekly in rainy season Weekly	Contractor's Representative (CR)/ Johannesburg Water
SOIL		
Surface or gully erosion on site Soil contamination with oils If small, clean up. If large, appoint a	Weekly in rainy season Monthly Immediately	CR/JW CR/JW CR/JW

ISSUE	FREQUENCIES OF MONITORING	RESPONSIBLE PERSON
suitable contractor for clean-up.		
Air		
Control domestic fires. Heavy vehicle emission control. Dust control of access roads. Wetting when required.	Weekly Monthly Weekly inspection	CR/ JW CR/JW CR
WASTE		
Efficiency of domestic waste collection. Prevention of burning of solid/liquid wastes on site. Proper collection and containment of liquid wastes (petroleum, oils, paints, resins & cooking oils) The recycling and/or disposal thereof. The collection and disposal of construction waste (concrete, wood, steel) Collection of hazardous waste.	Weekly Weekly Monthly Bi Weekly Monthly Bi Weekly	CR/JW CR/JW CR/JW CR CR/JW CR/JW
WILDLIFE		
Weed Control Control of illegal hunting or snaring of game, birds or other wild animals.	On-going On-going	CR/JW CR/JW
SOCIAL		
Inspect overall appearance of site. (paint work, cleanliness &	Weekly	CR

ISSUE	FREQUENCIES OF MONITORING	RESPONSIBLE PERSON
housekeeping)		
Resolve complaints	Daily	CR/JW
Monitor behaviour of labourers	Daily	CR/JW
SAFETY		
Inspect road signs, pedestrian and vehicle behaviour	At least once a week	CR/JW

6.3 Internal Audits and Reporting

Typically, an audit analyses the results obtained from monitoring, assesses whether objectives and targets have been met and whether there are variances from the stipulated EMP and legal requirements. In addition, the audit assesses whether EMP implementation has been undertaken according to planned arrangements and that the EMP itself is being appropriately updated. The audit should confirm that identified corrective actions have been undertaken and then assess the effectiveness of such actions. The timing of audits should be included in the implementation schedule in the EMP.

The key steps in a successful audit are:

- Establish audit procedures.
- Determine the frequency of audits.
- Ensure that the auditors are competent, in that they must be able to undertake the audit objectively and competently. Audits may be undertaken by internal or external parties, although certain I&AP requirements may define a need for external auditors.
- Maintain records of audits.

A procedure is to be developed by the project management team for conducting EMP audits, and should incorporate processes for scheduling and reporting, as well as the timing and frequency of the audits. This procedure should also address responsibilities and required resources. The EO is usually responsible for the

maintenance of the environmental audit information that is required prior, during and after an audit. Internal audits must be undertaken by Johannesburg Water Environmental Section on monthly basis.

6.3.1 Monthly compliance rating

A monthly compliance rating will be calculated for each Principal Contractor as per a formula determined by Johannesburg Water SOC Ltd focussing on or incorporating outcomes of assurance (e.g. monthly audit), operational assessments and other requirements, as necessary. Johannesburg Water SOC Ltd reserves the right to adjust the monthly compliance calculation formula as and when required – each revision of the monthly compliance calculation formula will be communicated to the Principal Contractor before implementation.

Each Principal Contractor is required to maintain a minimum compliance rating of 93% (Ninety Three Percent)

Table 5: Compliance Rating Protocol

Classification	Scoring	Classification description
Good	**93 – 100%**	Substantial compliance
Average	**80-92%**	Compliance status needs to be improved
Poor	**61-79%**	Methods to ensure compliance require substantial improvement
Very poor	**<60%**	Methods to ensure compliance failed completely - no system in place

6.3.2 Work Stoppage

Work stoppages will be identified for 2 (two) types of work stoppages to be implemented:

- Overall work stoppage – the Principal Contractor and its Contractors are not allowed to continue with any type of construction / site work up until the work stoppage has been closed-out;
- Activity work stoppage – The Principal Contractor and its Contractors are not allowed to continue with the specific activity / task / job up until the work stoppage has been closed-out.

Overall work stoppages will be issued where non-conformances are identified against the criteria in Annexure C.

6.4 Environmental Awareness Plan

OBJECTIVE: Ensure all operation personnel have the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and on-going minimisation of environmental harm (Environmental Awareness Plan)

To achieve effective environmental management, it is important that Contractors and site employees are aware of the responsibilities in terms of the relevant environmental legislation and the contents of this EMP. Johannesburg Water is responsible for informing its employees and contractors (transportation contractor) of their environmental obligations in terms of the environmental specifications, and for ensuring that employees are adequately experienced and properly trained in order to execute the works in a manner that will minimise environmental impacts. Johannesburg Water's obligations in this regard include the following:

- Employees must have a basic understanding of the key environmental features of the depot and its surrounding environment.
- Ensuring that a copy of the EMP is readily available on-site and that all site staff is aware of the location and has access to the document. Employees must be familiar with the requirements of the EMP and the environmental specifications as they apply to the operation of the facility.
- Ensuring that, prior to commencing any new site works, all employees have attended an Environmental Awareness Training course. The course must provide the site staff with an appreciation of the project's environmental requirements, and how they are to be implemented.
- Awareness of any other environmental matters, which are deemed to be necessary by the depot manager.
- Ensure that construction workers have received basic training in environmental management, including the storage and handling of hazardous substances, minimise of disturbance to sensitive areas (wetland), management of waste and prevention of water pollution
- Records must be kept of those that have completed the relevant training.
- Training should be done either in a written or verbal format but must be in an appropriate format and language for the receiving audience
- Refresher sessions must be held to ensure the operating staffs are aware of their environmental

obligations.

Therefore, prior to the commencement of construction activities on site and before any person commences with work on site thereafter, adequate environmental awareness and responsibility are to be appropriately presented to all staff present onsite, clearly describing their obligations towards environmental controls and methodologies in terms of this EMPr. This training and awareness will be achieved in the following ways:

6.4.1 Environmental Awareness Training

Environmental Awareness Training must be undertaken by the Environmental Officer and must take the form of an on-site talk and demonstration by the Environmental Officer before the commencement of construction activities on site. A record of attendance of this training must be maintained by the Environmental Liaison Officer/SHE Officer on site.

6.4.2 Formal Environmental Training

JW must ensure that there is a budget allocated for environmental formal training in CAPEX projects for the skills development of community where project is being undertaken. The principal Contractor shall identify short courses and include them on the training matrix that can be done on site during project duration. The following are some of the trainings that can be done on site:

- ISO14001:2015 Environmental Management System Awareness
- Handling of bee hives
- Snake awareness and handling
- Environmental legal Liability.
- Waste Management
- Environmental Site Representative

The principal Contractor must ensure that they appointing a registered company that meet all the requirements and before appointment of service provider, the files shall be submitted to Environmental Section for evaluation.

6.4.3 Induction Training

Environmental induction training must be presented to all persons who are to work on the site – be it for short or long durations. Contractors or Engineers staff, site staff, sub-contractors or visitors to site.

This induction training should include discussing Johannesburg Water's environmental policy and values, the function of the EMP and the importance and reasons for compliance to these. The induction training must highlight overall do's and don'ts on site and clarify the repercussions of not complying with these. The reporting procedure must be explained during the induction as well. Opportunity for questions and clarifications must form part of this training. A record of attendance of this training must be maintained by the SHE officer on site.

6.4.4 Toolbox Talks

Toolbox talks should be held on a scheduled and regular basis (at least once a month) where the foreman/site supervision manager, environmental and safety representative and all employees on site hold talks relating to environmental practices and safety awareness on site. These talks should also include discussions on possible common incidents occurring on site and the prevention of reoccurrence thereof. Records of attendance and the awareness talk subject must be kept on file.

6.5 Erosion Management Plan

The objective to control soil erosion from an ecological perspective is:

- To reduce the effects of raindrop splash erosion on exposed soil surfaces.
- To keep rainwater on the soil surface for as long as possible to increase the infiltration rate and reduce surface runoff.
- To reduce the speed of surface runoff to reduce the erosion effect of the soil surface.
- To provide methods to retain soil, debris, seed banks and organic matter being carried away by runoff.
- To improve water retention of the area (Coetzee, 2005).

Areas with a high soil erosion potential on the site

Areas identified as being of high soil erosion potential on the site include:

- Any areas without vegetation cover

- Excavated areas
- Steep areas
- Areas which undergo overland flow of water.
- Areas close to water
- Irrigated areas
- Compacted areas
- Rivers
- Drainage lines
- Any areas where developments cause water flow to accelerate on a soil surface.

If any erosion features are present as a result of the activities mentioned above the ELO must:

Assess the situation.

- Take photographs of the soil degradation.
- Determine the cause of the soil erosion.
- Inform and show the relevant contractors the soil degradation.
- Inform the contractor that rehabilitation must take place and that the contractor is to implement a rehabilitation method statement and management plan.
- Monitor that the contractor is taking action to stop the erosion and assist them where needed.
- The progress of the rehabilitation must be monitored weekly and recorded in the site diary.
- All actions with regards to the incidents must be reported on in the monthly Audit report.
- If the erosion incident has not being addressed by the contractor within 14 days of you reporting it, the Johannesburg Water's Environmental Section must be informed.

The contractor/ developer (with the EO's consultation) must:

Select a system to treat the erosion

Design the treatment system

Implement the system

Monitor the area to see if the system functions like it should, if it the system fails adapt or adjust the system to ensure erosion is controlled.

Monitoring must continue until the area has been stabilized

General Erosion

The civil works contractor may use the following instruments to combat erosion when necessary:

- Reno matrices
- Slope attenuation
- Shade catch nets
- Mulching
- Hydro-seeding or transplanting
- Re-vegetating
- Tilling (roughing the surface)

Erosion Management control measures

Ensure that all soil surfaces are protected by vegetation or a covering to avoid the surface being eroded by wind or water.

Ensure that heavy machinery don't compact areas that are not meant to be compacted as this will result in compacted hydrophobic, water repellent soils which increase the erosion potential of the area.

Surface water control measures

Prevent the concentration or flow of surface water or storm water down cut or fill slopes or along pipeline routes or roads and ensure measures to prevent erosion are in place prior to construction.

Storm water and any runoff generated by hard surfaces should be discharged into retention swales or areas with rock rip-rap. These areas should be grassed with indigenous vegetation. These energy dissipation

structures should be placed in a manner that flows are managed prior to being discharged back into the natural water courses, thus not only preventing erosion, but also supporting the maintenance of natural base flows within these systems, i.e. hydrological regime (water quantity and quality) is maintained.

- Mitigate against siltation and sedimentation through the use of the above mentioned structures and ensure that all structures do not cause erosion.
- Ensure that all storm water control features have soft engineered areas that attenuate flows, allowing for water to percolate into the local aquifers.
- Minimise and restrict site clearing to areas required for construction purposes only and restrict disturbance to adjacent undisturbed natural vegetation.
- Vegetation clearing should occur in parallel with the construction progress to minimize erosion and/or run-off. Large tracts of bare soil will either cause dust pollution or quickly erode and then cause sedimentation in the lower portions of the catchment.
- Minimise the diversion of flows into different catchments.
- If implementing dust control measures, prevent over-wetting, saturation and run-off that may cause erosion and sedimentation.
- Water course (stream) crossings should not trap any run-off, thereby creating inundated areas, but allow for free flowing water courses.

ALL EROSION CONTROL MEASURES

Areas susceptible to erosion must be protected by appropriate measures and repair of any damage caused by erosion due to construction activities must be under taken as soon as possible.

Minimise erosion and sedimentation into water courses through effective stabilisation (gabions and reno mattresses) and re-vegetation of disturbed river banks (Refer to rehabilitation specifications and erosion control measures below).

Stabilisation of sandy, dispersive slopes or slopes steeper than 1:3 will be required.

Ensure that bare soil is covered and hydro seeded to reduce topsoil loss.

The ELO should compile and keep an Incidents and Accidents Register on site in which all incidents and accidents are recorded, e.g. chemical spills, fires, accidents involving workers and vehicles, etc.

The following information must be recorded in the Incidents Register:

- The name and contact details of the persons involved
- The person recording the incident
- The date and time of incident
- The nature, extent and cause of the accident
- The name and contact details of any persons notified of the incident
- The actions taken to deal with the incident and whether the accident has been sufficiently
- Dealt with additional steps required to prevent recurrence of the incident.

7. RECORD KEEPING, COMPLIANCE AND PENALTIES

Various records will be kept on site for monitoring purposes these include but not limited to:

- Copy of Environmental Management Plan
- Approved Environmental Method Statements
- Environmental Authorisation
- Environmental induction attendance register
- Hazardous chemicals register
- Waste disposal register and disposal certificates
- Oil/fuel spill register

Records of non-compliance shall also be kept on record and will include the nature and magnitude of the non-compliance in a register, the action taken to discontinue the non-compliance, the action taken to mitigate its effects and the results of the actions. External complaints received regarding activities on the construction site pertaining to the environment shall be recorded in a public complaints register and the response noted with the date and action taken. This record shall be submitted with the monthly reports and a verbal report given at

the monthly site meetings. A score of 90% is required for the Monthly Audit undertaken by the Johannesburg Water's Environmental Officers.

8. DECOMMISSIONING

Objective

- To avoid and or minimise the potential environmental and social impacts associated with the decommissioning phase

Mitigation Measures

Mitigation measures as detailed in the construction phase on the EMP regarding impacts on flora, fauna, habitats and wetlands would be applicable to this phase.

- Rehabilitation to be undertaken in terms of specifications outlined in the Rehabilitation section of this EMP as well as in terms of any specific requirements applicable at the time.

Johannesburg Water EO will need to supervise decommissioning activities

JW EMP Annexure A: Environmental Management Requirement Acknowledgement Letter

Environmental Requirement for Contractors and Suppliers working for Johannesburg Capital Expenditure (CAPEX) projects	**Unique no**	**JWEMP:122017**
	Revision no	**00**

I, the undersigned, hereby acknowledge that I have obtained copies of the following listed documentation and confirm that I fully understand the contents thereof and the consequences of non-compliance. The Contractor furthermore reiterates its commitment to compliance of the requirements contained within the following provided documentation:

Name of the Contractor	
Vendor Number	
Project Number	
Scope of Work	

Declaration by Capital Expenditure Projects Contractor

- I undertake to adhere to the requirements as set out in:
  - Johannesburg Water Environmental Management Plan and Waste Management Plan
  - Environmental requirements for Contractors working on Capital Expenditure Projects
- I undertake to comply with all applicable environmental legal and other requirements.
- Undertake to comply with Johannesburg Water's environmental standards, policies and procedures where applicable.
- I pledge to inform all staff of their role in managing environmental impacts on site.
- I am fully aware that incidents must be reported within 24 hours of occurrence.
- I pledge to implement environmental best practice on site at all times during the contract.
- I pledge that all non-conformances issued to us will be addressed promptly.

I hereby acknowledge that I have obtained copies of Johannesburg Water Environmental Management Plan and Waste Management Plan and confirm that I fully understand the contents thereof and the consequences of non-compliance. The Contractor furthermore reiterates their commitments to compliance of the requirements contained within the following provided documentations and conform to all above mentioned requirements.

Signed at …… on this …….. Day of …… 20……..		
Contractor	Signature:	Date:
Project Engineer (Witness)	Signature:	Date:

Annexure B: Contractors Environmental File Evaluation Form

CONTRACTORS ENVIRONMENTAL FILE EVALUATION FORM

A minimum score of 80% is required on all sections for the approval of the submitted Environmental file System. Failure to achieve the required score will result in non-approval of the Environmental file, and the project will not commence prior file approval.

ENVIRONMENTAL SYSTEM EVALUATION OUTCOME			
AVERAGE SCORE OBTAINED			**0.00%**
		APPROVED/REJECTED	
EVALUATED BY:	**REVIEWED BY:**	**APPROVED/REJECTED BY:**	**ACKNOWLEDGED BY:**
DESIGNATION:	**DESIGNATION:**	**DESIGNATION:**	**DESIGNATION:**
SIGNATURE:	**SIGNATURE:**	**SIGNATURE:**	**SIGNATURE:**
DATE:	**DATE:**	**DATE:**	**DATE:**

PROJECT DETAILS			
Contract Number			
Project Title			
Name of Contractor			
Is the project screened?	YES/NO	IF NO	Construction activities/work (including site establishment) should ONLY commence when after the project is Screened
Specialist Studies/Report			
Environmental Authorisation (If applicable)			
Water Use Licence /General			

DISCLAIMER

1.Should there be any other Environmental related activities issued as non-compliance during construction, the contractor is liable to comply with those requirements

2.Should the contractor deviate from the conditions and requirements of the EMP and/or Environmental Authorisation (if applicable), the contractor is liable for non-compliances, rectification and associated fines thereof

3. This EMP does not exempt the Contractor from complying with other relevant legislations related to the construction activities.

Authorisation (If applicable)				

SCORE ANALYSIS		
	Satisfactory (Approved)	Requirements have been met
0.00%	Unsatisfactory (Not Approved)	Requires substantial improvement / partially achieved

ENVIRONMENTAL	REQUIRED DOCUMENTS	
1	Copy EMP and signed acknowledgement letter for JW EMP	0
2	SHE/ELO appointment letter	0
3	Contractor Environmental Induction presentation	0
3	Environmental Toolbox talk and copy of attendance register template	0
5	Environmental Objective (Site specific)	0
6	Environmental Policy Statement	0
7	**Registers**	0
3	Legal Register (Site specific)	0
9	Environmental Aspect and Impact register (site specific)	0
10	Permit register	0
11	Non Conformance Register	0
12	Waste register template	0
13	Complaint register	0
14	Incident register	0
1	Method statement register	0
16	Hazardous substances register	0
17	Daily Environmental checklist/ weekly checklist and spill kit checklist	0
18	Spill kit checklist	0

19	**Method statements or procedures**	0
2	Document control procedure	0
2	Storm water management plan/ Erosion control	0
22	Alien invasive and weeds control plan	0
23	Hazardous Management Plan/ Procedure (i.e. .handling of hazardous substances)	0
24	Method statement for the activities to be undertake/(include environmental aspects on the technical MS)	0
25	Waste management plan/ Method statement for waste management	0
26	Incident report template (Flash report/Investigation report)	0
3	Emergency Response Plan	0
28	Training Matrix	0
29	Dust Management Plan or Method Statement for dust suppression	0
30	Contractor Audit procedure/template	0
31	Rehabilitation Plan or Method Statement for Rehabilitation/Reinstatement	0
TOTAL		**0**

Annexure C: Environmental Work instruction

ENVIRONMENTAL MANAGEMENT (EM) SITE INSTRUCTION

Document No : JW- EMS-HO—R014

1. All JW rules and regulation including JW Environmental Management Plan and other applicable legislation, standard and by-laws must be adhered to at all times.
2. Copies of Environmental Authorisation, Water Use License/General Authorization, Rehabilitation plan, EMP shall be kept on site **(where applicable).**
3. All JW sites must have waste bins, drip trays, spill kit and designated hazardous storage **(where applicable).**
4. Only registered Waste Service providers who comply with National Environmental Management Waste Act and Municipal By-laws shall be appointed.
5. No burning or burying of waste is allowed on site.
6. The conservation of water and the use of energy efficiently shall be implemented in all JW sites.
7. The letter from City Parks for occupying the open space shall be received and kept in the file and if the land belongs to the private owner, the copy of an agreement letter shall be kept in the file **(where applicable).**
8. The photos are taken before and during and after the project **(where applicable).**
9. The Environmental file must be approved before the commencement of works on site **(where applicable).**
10. The Environmental file will be kept on site all the times and shall be made available to competent authority and JW environmental representative **(where applicable).**
11. Rehabilitation/ reinstatement of the site must be done as per the JW EMP, rehabilitation method statement.
12. The hazardous waste must only be stored not more than 90 days on site as per the legislation.
13. Only asbestos registered service providers shall be appointed to handle and dispose asbestos to registered landfill site.
14. No mixing of general and hazardous waste will be allowed.
15. No cutting of trees is allowed on site without permit.
16. If archaeological artefacts or anything of heritage importance are found at JW sites/ servitude Environmental Section must be informed.
17. Everyone working within JW sites shall familiarize with the EMP requirements and other applicable JW environmental procedures.
18. All the environmental incidents shall be reported within 24 hours to JW environmental Section.
19. Ensure that all JW employees and its service providers or suppliers receive environmental induction.
20. All work must be carried out under close supervision by the competent persons.
21. Repetitive findings or non-compliances shall be avoided.
22. Topsoil stockpile shall be protected by erosions control berms if it is exposed to a period of 14 days during wet season (where applicable).
23. Only 150mm of topsoil shall be removed and stockpile at a height of not more than 1m.
24. All hazardous material must be stored on a bunded and ventilated storage, and MSDS must be available for all of them.
25. No painting or marking of natural features is allowed on site.
26. Pollution of the environment shall be prevented all the times.
27. No leaking mobile plant is allowed on site.
28. Dust control measures shall be implemented on site (where applicable).
29. No sewer spillage shall spill into the storm water or the watercourse.
30. All environmental related incidents and/or emergencies shall be investigated within 48 hours from the date of notice.
31. Killing of fauna and/or Avi-fauna is prohibited.
32. Alien invasive and weeds must be eradicated.
33. Fumigation shall be done by trained a personnel that is registered with DAFF.
34. No smoking is allowed in restricted areas. All such areas are posted appropriately.

35. Personal protective equipment is required to be worn at all times in production areas.
36. Maintain good housekeeping in your work area.
37. Keep fire lanes, roadways, walkways and aisles free and clear of material.
38. The use of unsafe or defective equipment or tools is not permitted.
39. A contractor or subcontractor shall leave no unused materials on site. At the completion of a project the contractor shall remove all unused material and all waste shall be properly disposed of at a registered landfill site.
40. Any contractor or subcontractor found to be in violation of any EH&S rules can be ejected or escorted off premises if deemed necessary.
41. This file shall be kept on site and will be available at all times to the JW Reps and authorities (upon request).

ACKNOWLEDGEMENT BY MANAGER/CONTRACTOR

I, _____ the Manager/Contractor, do hereby declare that my site/company _____ _____acknowledges having read and understood the conditions contained in this document and furthermore, the employees agree to abide by these conditions.

CONTRACTOR/FACILITY REP. NAME	SIGNATURE	DATE

ENVIRONMENTAL SITE INSTRUCTION		Document No : **JW- EMS-HO—R014**	
Name of Contractor/Facility			
Responsible Manager/ Engineer			
Project No. ***(where applicable):***	Date Issued:		Date of Inspection:
Environmental Representative:		Designation:	
Should the responsible persons fail to comply with any term of this instruction, JW may demand compliance in writing from the defaulting party. Should the defaulting party fail to comply within the stipulated time frames, JW shall take the necessary steps to remedy the situation.		**PROJECT DESCRIPTION**	

Reference No. of Non-Conformances	**Action Required**
EM-1.	
EM-2.	
EM-3.	
EM-4.	
EM-5.	
EM-6.	
EM-7.	
EM-8.	
EM-9.	
EM-10.	

Received & Acknowledged by	**Signature**	**Date**
Responsible Manager/Contractor		
Responsible Consultant ***(where applicable)***		
JW Environmental Representative		

DISCLAIMER

1.Should there be any other Environmental related activities issued as non-compliance during construction, the contractor is liable to comply with those requirements

2.Should the contractor deviate from the conditions and requirements of the EMP and/or Environmental Authorisation (if applicable), the contractor is liable for non-compliances, rectification and associated fines thereof

3. This EMP does not exempt the Contractor from complying with other relevant legislations related to the construction activities.

JW Project Inspector / Engineer ***(where applicable)***		
Contractor SHE/EL Officer ***(where applicable)***		

COMMENTS BY RESPONSIBLE MANAGER/ENGINEER:	**Target date for corrections**	
	Accepted/Acknowledged by Manager/Contractor	
COMMENTS BY CONTRACTOR *(WHERE APPLICABLE)*:	**Follow up comments by JW Environmental Representative**	

ANNEXURE 5:

WASTE MANAGEMENT PLAN

Johannesburg Water DOCUMENT OWNER: Occupational Health Safety, Environment and Disaster Management Department	DOCUMENT TYPE: **1. Waste Management Procedure**	DOCUMENT NO.: JW (WMP 001)
TITLE: **Procedure for Handling and Managing Waste**		IMPLEMENTATION DATE:
OHSE & DM CREATION TEAM	AUTHOR/COMPILED BY: SIGN **Edward Nduvheni** **Environmental Manager**	RECOMMEND AND APPROVED: SIGN **Boetie Mashigo** **Occupational Health, Safety, Environment & Disaster Management Manager**	REVISION NUMBER: 01 NEXT REVISION DATE Page

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1. INTRODUCTION

Johannesburg Water Waste Management Procedure (WMP) is a document that details goals and programmes for the management of waste in a manner that meets Johannesburg Water requirements and complies with all legislative requirements.

The procedure also recommends possible methods that can be used in the collection, transportation of waste to disposal and processing facilities. Effective waste management is critical in ensuring the prevention of pollution, ecological degradation and reduction of the environmental footprint.

An integrated approach is also required to minimise and manage all waste streams and the associated risks in an environmentally acceptable and cost-effective manner. JW will manage waste in a responsible manner through the identification and proactive management practices of waste. This commitment is based on the waste management principles that embody avoidance of waste generation, and where avoidance is not possible, promote the conservation of resource use through effective and efficient resource utilisation, minimisation, reuse, recycling and the disposal of the remaining waste.

The WMP extends over the entire waste cycle from cradle to grave, and covers generation, collection, transportation, treatment, storage, classification and final waste disposal. It is a move away from traditional approaches of management of environmental impact and remediation to establishing a waste management system which focuses on waste prevention and minimisation. This document shall be implemented, monitored and audited in order to ensure continual improvement of waste management performance across JW projects/ CAPEX, OPEX and associated activities. It is also produced in order to have standardisation of the process and activities related to waste management across JW. The Plan will be reviewed when the need arises and/or there is a change in scope or nature of the business to ensure continued relevance and effectiveness, and compliance will be measured through audits and inspections.

Johannesburg Water will practice the five environmental management principles in line with NEMA (107 of 1998)

- Duty of care - the waste is avoided, minimised, reused or recycled or otherwise disposed of in a responsible manner
- Cradle to grave- responsibility for the waste and the considerations of the waste exist throughout its life cycle
- Polluter pays principle – any organisation causing pollution is liable for the costs of cleaning it up
- Precautionary principle – always assume that waste is hazardous until shown to be safe:
- Preventative principle – reduce risk by collection, treatment and disposal to take place as near as possible to the point of generation as is technically and environmentally feasible.

This procedure is necessary to provide the minimum management requirements of waste streams that can pose a significant risk to Johannesburg Water.

2. SCOPE

2.1 PURPOSE

The purpose of this procedure is to ensure the effective management of all waste generated system is established, implemented and maintained at Johannesburg Water Offices, CAPEX and OPEX, in order to prevent pollution and other Safety, Health and Environmental adverse conditions or situations in accordance with acceptable environmental legislations and other applicable standards and/or requirements.

2.1 APPLICABILITY

This procedure aims to address the management of all relevant waste streams within JW sites and/or depots. It does not relieve any person in any way from any of his/her legal responsibilities in respect of environmentally sound waste management of waste streams not addressed in this procedure. It covers measures pertaining to handling, storage and disposal of general, hazardous, medical waste and other waste generated at JW sites/depots in an attempt to embrace the cradle to grave

concept. This procedure is applicable to all employees, suppliers and contractors performing work at JW and/or for JW.

3. REFERENCE

- The Constitution of the Republic of South Africa,1996 (Act No. 108 of 1996).
- National Environmental Management Act,1998 (Act No. 107 of 1998).
- National Environmental Management: Waste Management Act No. 59 of 2008.
- Occupational Health and Safety Act, 1993 (Act No. 85 of 1993).
- Hazardous Substances Act, 1973 (Act No. 15 of 1973).
- National Road Traffic Act, 1996 (Act No. 93 of 1996).
- Health Act, 1977 (Act No. 63 of 19977).
- SANS 14001:2015- Environmental Management Systems.
- Asbestos Regulation, 2001 (promulgated under the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993).
- Department of Water Affairs and Forestry, 2nd Edition, 1998: Waste Management Series: Minimum requirements for Waste Disposal by Landfill.
- Department of Water Affairs and Forestry,3rd Edition,2005: Minimum Requirements for the Handling ,Classification and Disposal of Hazardous Waste.
- ISO 14001:2015 Environmental Management Systems.
- National Waste Management Strategy (NWMS).
- Sludge Guideline.
- Guidelines for good practice in the health care
- PROFESSIONS

4. TERMS, DEFINITIONS, CLASSIFICATION AND ABBREVIATIONS

4.1 Definitions

All definitions below are as defined on NEMA and NEM: WA. All other definitions shall beInterpreted as presented on the ISO Standards.

Duty of Care: It is whereby the generator of the waste is ultimately responsible for ensuring that the waste is handled, stored, transported and disposed of according to the legislation and in an environmentally sound and responsible manner.

Cradle to Grave: It is the responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle.

Clinical glass: Glass possibly contaminated with blood and body fluids or chemicals, (e.g. blood collection tubes, laboratory glass, medication vials).

Waste: Referred to any substance, whether or not that substance can be reduced, reused, recycled and recovered: that is surplus, unwanted, rejected, discarded, abandoned or disposed of which the generator has no further use of the purpose of production, that must be treated or disposed of ,that is identified as a waste by the Minister by notice in the Gazette. It includes waste generated by contractors, medical or any other sector but, a by-

product is not considered as waste, any portion of waste, once reused, recycled and recovered, ceases to be waste.

Hazardous Waste: All waste containing organic or inorganic elements or compounds that may, owing to inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment i.e. Group I, Group II, Group III and Group IV hazardous substances in terms of the Hazardous Substances Act No. 15 of 1973.

Note: All human anatomical waste such as blood and body fluids are potentially hazardous. Human/animal anatomical waste:

Waste consisting of:
Tissues;
Organs;
Body parts;
Products of conception; and

General Waste: All waste generated in the normal day to day activities in the homes, canteens, offices, constructions which does not pose any immediate hazard or threat to health and/or the environment (which include but not limited to domestic waste, building rubble and demolition waste, business waste and inert waste etc.)

Inert Waste: "means waste that -
(a) does not undergo any significant physical, chemical or biological transformation after disposal;

(b) does not burn, react physically or chemically biodegrade or otherwise adversely affect any other matter or environment with which it may come into contact; and
(c) does not impact negatively on the environment, because of its pollutant content and because the toxicity of its leachate is insignificant;

"Health care risk waste"/Medical waste: Means waste capable of producing any disease and includes but is not limited to: Laboratory waste; Pathological waste; Genotoxic waste; Infectious liquids and infectious waste; Sharps waste;

Chemical waste: Pharmaceutical waste and waste generated from the clinic.

Office Waste: All waste generated from office and from office work as well as unused/unwanted (i.e. old/unused computers, cartridges, papers etc.)

Waste accumulation date: It is the first date/day in which the waste is disposed into the provided medical waste container.

Storage: The accumulation of waste in a manner that does not constitute treatment or disposal of that waste

Disposal: Referred to the burial, deposit, discharge, abandoning, dumping, placing or release of any waste into, or onto, any land.

Recovery: means the controlled extraction of a material or the retrieval of energy from waste to produce a product

Recycle: means a process where waste is reclaimed for further use, which process involves the separation of waste from a waste stream for further use and the processing of that separated material as a product or raw material

Re-use: means to utilise articles from the waste stream again for a similar or different purpose without changing the form or properties of the articles

Storage: means the accumulation of waste in a manner that does not constitute treatment or disposal of that waste

Treatment: means any method, technique or process that is designated to –

(a) change the physical, biological or chemical character of composition of a waste; or

(b) remove, separate, concentrate or recover a hazardous or toxic component of a waste; or

(c) destroy or reduce the toxicity of a waste, In order to minimise the impact of the waste on the environment prior to further use or disposal

Waste Management License: Referred to a license issued in terms of section 49 of the National Environmental Management Waste Act, Act No. 59 0f 2008

Waste Disposal Facility: Referred to any site or premises used for the accumulation of Waste with the purpose of disposing of that waste at that site or on that premises

Waste Transfer Facility: Referred to a facility that is used to accumulate and temporarily store waste before it is transported to a recycling, treatment or waste disposal facility.

Waste management activity: means any activity listed in Schedule 1 of the Environmental Management: Waste Act or "waste minimisation programme" means a programme that is intended to promote the reduced generation and disposal of waste

Waste minimisation program: means a programme that is intended to promote the reduced generation and disposal of waste.

4.2 Classification

Controlled disclosure: controlled disclosure to external parties (either enforced by law, or discretionary).

4.3 Abbreviations

Abbreviation	Description
CAPEX	Capital Project
OHSE & DM	Occupational Health Safety, Environment and Disaster Management Manager
CFL	Compact Fluorescent Lamps
DEA	Department of Environmental Affairs
ECO	Environmental Control Officer
EO	Environmental Officer
EIA	Environmental Impact Assessment
ELC	Environmental Liaison Committee
EM	Environmental Manager
EMP	Environmental Management Plan
ES	Environmental Specialist
GN	Government Notice
GDARD	Gauteng Department of Agriculture & Rural Development
H:H	High Hazard

HSEP	Health, Safety & Environmental Practitioner
JW	Johannesburg Water
OHN	Occupational Health Nurse
OPEX	Operational
MSDS	Material Safety Data Sheets
NEMA	National Environmental Management Act (Act 107 of 1998)
NEM:WA	National Environmental Management: Waste Act (Act 59 of 2008)
PCB	Polychlorinated Biphenyl
PPC/E	Personal Protective Clothing/Equipment
PS	Project Specialist
SHE	Safety, Health and Environment
WMP	Waste Management Procedure

5. RESPONSIBILITIES AND AUTHORITY

5.1. Managers and Supervisors

- To ensure compliance to relevant legislation and guidelines on procedures.

5.2. ES & HSEP

- To monitor the application of this procedure and to report deviations observed to the relevant Managers and/or Supervisors.

- To ensure that all waste generated on site is recycled and/or disposed of in a responsible manner in line with the JW Waste Management Procedure and its plan and other relative environmental legislative and other applicable standards or requirements.

5.3. OHN

- Is responsible for managing medical waste in the clinic in an appropriate manner as per requirements of the OHS Act No. 85 of 1993, Hazardous Substances Act No. 15 of 1973 and Gauteng Health Care Risk Waste Regulations.

5.4. OHSE & DM Team (ES, PS, HSEP, OHN)

- To review this procedure annually and to attend to adversities/deviations that might occur.

5.5. Maintenance Manager/s

- Shall notify and call the contractors/service provider to collect scrap metal, used oil and empty drums and fluorescent tubes.

5.6. Managers, Works Managers, Regional Managers, Depot Managers and/or Supervisors

- Shall notify the Occupational Health Nurse when the medical waste containers are full.

5.7. Project Managers/Engineers/ Resident Inspectors and Contractors

- Monitor the overall control of the project and oversee the implementation of the waste management procure at construction site.
- Provide overall JW WMP to the contractor.
- Ensure that JW WMP requirements are understood by contractor
- Provide support and advise to contractors on waste management issues.
- It is the responsibility of the Project Unit Department (CAPEX) when appointing contractors, to include reference to this procedure in the contract for adherence by the principal contractors as well as other sub-contractors, suppliers of the activity product or service.

5.8. CAPEX Contractor

Compile a project specific Waste Management Plan that shall be reviewed by Johannesburg Water.

- Appoint competent personnel (i.e. as per OHS and Environmental Specification) to ensure compliance to this procedure and other related requirements in this regard.
- Set waste management targets for reduction, reuse, recycling, and general waste recycling.
- Monitor performance against targets and be in a position to explain negative variances.
- Submit periodic reports to Johannesburg Water OHSE & DM regarding compliance to project specific WMPs.
- Continually review project specific WMPs to ensure relevance and effectiveness.
- The Contractor on monthly basis shall submit the waste manifest, safe disposal certificates and weighbridge to JW OHSE & DM.

5.9. Waste Contractor

- Manage the collection and disposal of waste in accordance with JW term service contract and in compliance with the NEM: Waste Act of 2008.
- The Waste Contractor shall provide the service level agreement made with the holder of licence and the licence or permit for the waste facility to JW.
- The Waste Contractor shall provide JW OHSE & DM with Access route map of the route it will be used when they come to collect waste and Emergency Response Plan in case of any waste spillages.
- Submit monthly reports on amount and type of waste disposed of.
- Submit Waste Manifest, Certificates of Safe Disposal and weighbridge slip,
- Comply with the environmental law prescribed for the transportation, handling and disposal of waste,

- Waste contractor shall be audited annually to ensure responsible disposal of waste, as part of the station's cradle to grave concept.

5.9. Waste Disposal Management and Treatment options

- All waste disposal sites/facilities receiving waste must have an appropriate permit issued by the relevant authority or Municipality,
- The waste contract who collects waste must issue a waste manifest document and the disposal facility issues a Safe Waste Disposal Certificate and weighbridge slip.
- Recycling activity must be done with the suppliers who are in a position of a permit applicable to the site for waste processing or atmospheric pollution permit for facilities such as incineration, waste paper processing, scrap metal recyclers etc.

6. DOCUMENT CONTENT

6.1 LEGAL FRAMEWORK

The underlying overarching framework for waste management is that, the generator is accountable and responsible for waste from cradle to grave. Waste management is one of those areas that is mostly governed by a single piece of legislation i.e. NEM: WA although there are others that support it.

Section 24 of the Republic of South Africa Constitution focuses on the Constitutional right to an environment that is not harmful to human health or well-being. In South Africa, there are a number of legislations that address waste management (generation, handling, transportation, treatment, and disposal). This makes it critical to develop and implement a WMP that is in

6.2 WASTE MANAGEMENT OBJECTIVES AND STRATEGIES

The primarily objective of waste management for the JW is to ensure that all waste is managed appropriately, capitalising on processes that prevent, minimise, reduce, recover and recycle. This contributes to ensuring that risks of exposing employees, the public and the impact on the environment are prevented and if not, minimised.

6.2.1 The specific objectives and targets of waste management for JW are as follows:

- To ensure that interfaces for waste management are clearly defined and understood by management and staff.
- To establish a standardised approach towards waste management in JW.
- To monitor waste generation in a bid to reduce waste generated over extended periods.
- To stipulate expectations to all parties doing work on behalf of JW.

7. WASTE PLANNING

Waste management planning involves the identification of waste types that shall be generated, classification of the waste into waste streams, estimation of waste quantities and the proposal of strategies for waste reduction.

7.1. WASTE STREAMS AND TYPES

According to the Department of Water Affairs Minimum Requirements for handling, classification and disposal of hazardous waste, waste classification is based on the severity of the risk associated with the waste. Further, waste is categorised for proper handling and disposal in a suitable waste disposal facility.

JW generates its waste from activities such as office administration, OPEX and CAPEX Projects. The waste types identified from JW fall under the categories of general and hazardous waste The bulk of waste produced by JW is predominantly general waste hence the need for a proper management system.

Table 1: Waste Streams and waste types

Waste streams and waste types
General Waste
• Cement bags (washed) • Paper • Heat Treated Wood • Uncontaminated Plastic • Cans / Tins • Bottles • Waste Tyres • Scrap Metal • Building and Demolition Rubble (Not Contaminated with hazardous substances) • Organic waste (i.e. garden waste, other wood materials)
Hazardous Waste
• Oil, Transformer Oil • Oil contaminated soil and waste • Solvents • Cement • Cement bags (unwashed) • Contaminated soil • Fluorescent tubes • Conductor drums (treated with hazardous substances) • Wood (treated with hazardous substances) • Medical Waste • SF6

- Spare mechanical parts
- Metal coated with hazardous substances
- Contaminated Building Rubble/dry concrete
- Wet Concrete
- E-Waste (incl. Printer cartridges and computers)
- Paint tins and cans
- Asbestos and asbestos containing material
- Herbicides and herbicides containers
- Grey water and sewerage
- Corpse
- Fetus
- Human organs
- Dead animals
- Pathological waste
- Sharps, especially contaminated sharps.
- Grit and Screen/s Waste

Medical Waste

- Waste generated after first aid treatments/applications
- SHE bin
- Pharmaceutical waste.

7.1.1. General Waste

The waste types identified under this stream are generated from activities such as site/office establishment and operation, vegetation clearing, excavations, pipe installation or pipe fixing. They include: garden waste, excess soil (spoilt) building rubble and scrap metal, food waste and re-usable/recyclables such as glass, paper, plastics, and tins, cardboard, wood and waste tyres. In most instances, general waste is temporarily stored in bins/ skips prior to removal by contractors to off-site general waste recyclable centres and/or disposal facilities.

- Examples of domestic wastes include but not limited to paper, plastic, food, cardboard box, cans, glass, wrapping materials etc.
- All waste is placed inside the labelled and/or colour coded bins provided in JW sites,
- Once the bins are full they are taken out to a skip placed in different demarcated areas on sites/depots,
- Once all general waste is placed inside the skip, the lid is then closed to prevent papers from being blown off by the wind,
- The service provider collects general waste on a weekly basis,
- The service provider arrives at the station and proceeds to the empty truck and then proceeds to the general waste storage areas for waste collection,
- At the storage area, the service provider offloads the empty skip and loads the full skip to the truck,
- Waste is disposed of at an licensed waste disposal site/facility,
- Once disposed of, a copy of ticket from the waste disposal facility is given to the service provider's driver/representative; one copy given to the Maintenance

Manager/Supervisor or Depots/Works Manager and forwarded by the Maintenance Manager/Depots or Works Manager to OHSE & DM section (HSEP & ES) for filling.

7.1.2 Hazardous Waste

Hazardous waste varies significantly in nature, composition, size and the severity of risks and harmfulness to people and the environment. These waste include: asbestos containing materials from old buildings and insulation, medical waste, fabric filter, fluorescent tubes, batteries, printer cartridges, paint tins, PCB containing oils, used oil and car parts from workshops, silica gel from transformers, used oil, grease and lastly oil contaminated waste which consists of oily rags used for wipe-ups and old PPEs and oil contaminated soils from spillages. In general, hazardous waste is stored at on-site hazardous waste storage areas before being removed by contractors, which are registered as hazardous waste transporters, and disposed of at a licensed H: H waste disposal facilities.

7.1.3 Used oil and chemical contaminated rags

- All used oil generated on site is stored in 210 litre drums at the workshops,
- All filled-up drums are taken to the Main Stores by workshop personnel,
- At the main stores the personnel offload the oil put it at the demarcated area with concrete slab and within the bund area where necessary,
- Once the oil is offloaded the main store is locked by Stores Assistant to prevent unauthorised entry,

- Once drum storage area is full at the main store and oily rags bin is full, Stores Assistant informs the Stores Supervisor, and the Maintenance Manager,
- Maintenance Manager initiates a call for a service provider to collect oily rags bin for disposal, and
- Stores Supervisor/ Maintenance Manager shall place an order for the filled used oil drums to be removed by the service provider.
- The service provider arrives at the site/depots and proceeds to take the empty tank and then proceeds to the main stores,
- At the stores, the service provider goes with the stores assistant to the storage area,
- At the storage area, the service provider decant the oil from drums to his oil tank using a sucking machine and load the empty drums as well,
- Service provider provides Stores Supervisor with waste manifest and safe disposal certificate,
- Stores Supervisor/Maintenance Manager issues a gate pass for service provider,
- The service provider collects the mass of full tank which will be recorded on the invoice as well as on the safe disposal certificate,
- The Invoice, Waste Manifest as well as the Safe Disposal Certificate, to be forwarded to the stores personnel who will maintain the copies of the waste manifest and safe disposal certificate and forward the originals to the OHSE & DM section for filling.
- Service provider shall be audited annually to ensure responsible disposal of waste, as part of the station's cradle to grave concept.

7.1.4 Oil Spill Management

- During a spill of oil, action should be taken immediately to prevent and contain the spill from spreading, contaminating the ground (soil), washed and contaminating the nearest water bodies, infiltrates down and contaminate ground water, washed and enter into the drains,
- Oil spill kits should be stored near the oil store that the user can access them easily when needed,
- All sites should have oil spill kits at the main stores,
- If you discover any spill of any significant proportion that you cannot handle, it must be reported to OSHE & DM section immediately,
- Oil containing equipment should be located within an oil tight secondary containment system such as a bund and drip trays to prevent oil leaks,
- Enclose all pipes, valves and gauges within the bund,
- The water in bund that may be contaminated with oil, should be sampled, tested and if contaminated, then dispose of as hazardous waste,
- Any used oil that is sent to the hazardous waste site need to be accompanied by the MSDS for that particular product,
- Contaminated soil material shall be stored into 210 L drum,
- The drum has to be labelled with relevant information written onto it,
- The collection of this waste shall be carried out by the registered contractor,
- The waste disposal must be done at the registered waste disposal facility,
- The mass of the full drum will be recorded on the invoice as well as on the Safe Disposal Certificate.

Oil Spill Management (conti...)

- The Invoice, Waste Manifest as well as the Safe Disposal Certificate, to be forwarded to the civil stores personnel who will maintain the copies of the waste manifest and safe disposal certificate and forward the originals to the OHSE & DM for filling.
- Waste contractor shall be audited annually to ensure responsible disposal of waste, as part of the station's cradle to grave concept

7.1.5. Medical waste

The activities that lead to the generation of this type of waste are first aids, employees wounded on sites or offices and clinics. All medical waste shall be handled according to the legal and JW requirements. The current practices within JW operations are that the contractors make arrangements with the medical facilities (clinics and hospitals) around their area of operations or with registered medical waste transporter. Any medical waste shall be handled in the manner as it is stipulated in the legislation, for the proper handling and disposal of these wastes. Examples of medicals waste, handling and disposal are as follows:

- Sharps/needles & soiled materials used on personnel coming for treatment at the clinic are put on a demarcated container stored in a dressing room,
- An accumulation date is put on the waste container - to ensure that the waste does not exceed 90 days,
- 20 days before the containers reach 90 days, Occupational Health Nurse initiates a call for a medical waste to be removed by a service provider,

- The service provider arrives at the station and proceeds to the Occupational Health Centre (clinic),
- At Occupational Health Centre, the service provider goes with OHN to the storage area of medical waste,
- At the storage area, the service provider counts and loads the containers of medical waste to the truck,
- The number of containers collected will be recorded on the invoice,
- The invoice, Waste Manifest as well as the Safe Disposal Certificate, to be forwarded to the OHN who will maintain the copies of the waste manifest and safe disposal certificate,
- All medical waste will be contained in the special bins provided. All sharp needles must be separated from other medical waste,
- All out dated and disused medicines will be disposed of as a hazardous medical waste or returned to the supplier for disposal. (Tablets and syrups will be crushed and/or dissolved before disposal as hazardous waste),
- The OHN will arrange for an approved hazardous waste disposal company to collect and dispose of this medical waste. The OHN is responsible for and authorised to keep all records in connection herewith (disposal certificates).

7.1.6 Laboratory Chemicals and broken glass

- Obsolete and redundant laboratory chemicals and used solvents,
- Laboratory chemicals will be stored in 210L sealed drum and broken glass in 20L sealed container,

- Laboratory chemicals shall be collected by the contractor managed by OHSE & DM section,
- Whenever this waste is removed for disposal it must be accompanied by MSDS, manifest and a copy kept on file at OHSE & DM section,
- All obsolete and redundant laboratory chemicals and solvents will be disposed of at a registered hazardous waste disposal site by an approved hazardous waste contractor.

7.1.7 Scrap metal (Ferrous and Non- Ferrous Scrap Metals)

- Workshop personnel take all scrap metal generated on site to the Main Stores, e.g. copper, pipes, aluminium, zinc, heavy & light metal etc.
- At the scrap yard, the personnel offload the scrap metal, separate it and place it at the demarcated area,
- Once the scrap metal is offloaded the main store is locked to prevent unauthorised entry,
- Once scrap metal storage area is full at the main store, Stores Assistant informs the Stores Supervisor/Maintenance Manager,
- Stores Supervisor/Maintenance Manager shall place an order for scrap metal to be removed.
- The service provider arrives at the station and proceeds to empty the truck and then proceeds to the main stores,
- At the stores, the service provider goes with the Stores Assistant to the storage area,

- At the storage area, the service provider loads the scrap metal to the truck.
- Stores Supervisor/Maintenance Manager issues a gate pass for service provider,
- The service provider proceeds with full truck of scrap metal, the mass of full truck will be recorded on the ticket,
- Copy of ticket from the service provider will be given to the Stores Supervisor/Maintenance Manager; one copy forwarded to the stores personnel who will forward the original to the OHSE & DM for filling.
- Stores personnel make a spread sheet indicating date of collection, type of scrap metal and quantity of metal collected,

7.1.8. Personal Protective Equipment/Clothing

- Contaminated/worn-out PPE is returned to stores in exchange for the new PPE including the Hazmat Gas/Partikel filter,
- PPE owner cuts the contaminated/worn-out PPE and places it inside the skip provided outside the fitting room in stores,
- Once all the PPE is placed inside the skip, the lid is then closed to prevent air contamination from the contaminated PPE,
- Once the skip is full, the stores personnel initiate a call out to the service provider/Waste Contractor to come and collected the skip.
- The service provider/contractor arrives at the sites/depots and proceeds to the stores to empty skip.)The information is sent to OHSE & DM for filling,
- At the stores, the waste contractor drop-off the empty skip,

- The mass of the full skip will be recorded on the invoice as well as on the Safe Disposal Certificate,
- The Invoice, Waste Manifest as well as the Safe Disposal Certificate, to be forwarded to the stores personnel who will maintain the copies of the waste manifest and safe disposal certificate and forward the originals to the OHSE & DM for filling.

Waste contractor shall be audited annually to ensure responsible disposal of waste, as part of the station's cradle to grave concept.

7.1.9 Empty Paint Tins

- All empty paint tins are taken to store yard after use at respective places on station,
- Empty containers are placed inside the skip provided outside the workshop,
- Once all the empty paint tins are inside the skip, the lid is then closed,
- Once the skip is full, the stores personnel initiate a call out to the Waste Contractor to come and uplift the skip,
- All empty paint tins are taken to store yard after use at respective places on station,
- Empty containers are placed inside the skip provided outside the workshop,
- Once all the empty paint tins are inside the skip, the lid is then closed,
- Once the skip is full, the store personnel initiate a call out to the Waste Contractor to come and uplift the skip,
- The contractor arrives at the station and proceeds to the store yard.

7.1.10 Scrap metal (Ferrous and Non- Ferrous Scrap Metals)

- Workshop personnel take all scrap metal generated on site to the Main Stores, e.g. copper, pipes, aluminium, zinc, heavy & light metal etc.
- At the scrap yard, the personnel offload the scrap metal, separate it and place it at the demarcated area,
- Once the scrap metal is offloaded the main store is locked to prevent unauthorised entry,
- Once scrap metal storage area is full at the main store, Stores Assistant informs the Stores Supervisor/Maintenance Manager,
- Stores Supervisor/Maintenance Manager shall place an order for scrap metal to be removed,
- The service provider arrives at the station and proceeds to the weigh bridge to weigh the empty truck and then proceeds to the main stores,
- At the stores, the service provider goes with the Stores Assistant to the storage area,
- At the storage area, the service provider loads the scrap metal to the truck,
- Stores Supervisor/Maintenance Manager issues a gate pass for service provider,
- The service provider proceeds with full truck of scrap metal, the mass of full truck will be recorded on the ticket,
- Copy of ticket from the service provider will be given to the Stores Supervisor/Maintenance Manager; one copy forwarded to the stores personnel who will forward the original to the OHSE & DM for filling.
- Stores personnel make a spread sheet indicating date of collection, type of scrap metal and quantity of metal collected,

- The information is sent to OHSE & DM for filling.

7.1.11 Personal Protective Equipment/Clothing

- Contaminated/worn-out PPE is returned to stores in exchange for the new PPE including the Hazmat Gas/Partikel filter,
- PPE owner cuts the contaminated/worn-out PPE and places it inside the skip provided outside the fitting room in stores,
- Once all the PPE is placed inside the skip, the lid is then closed to prevent air contamination from the contaminated PPE,
- Once the skip is full, the stores personnel initiate a call out to the service provider/Waste Contractor to come and collected the skip,
- The service provider/contractor arrives at the sites/depots and proceeds to the stores to empty skip.
- At the stores, the waste contractor drop-off the empty skip
- The mass of the full skip will be recorded on the invoice as well as on the Safe Disposal Certificate,
- The Invoice, Waste Manifest as well as the Safe Disposal Certificate, to be forwarded to the stores personnel who will maintain the copies of the waste manifest and safe disposal certificate and forward the originals to the OHSE & DM for filling.
- Waste contractor shall be audited annually to ensure responsible disposal of waste, as part of the station's cradle to grave concept.

7.1.12 Empty Paint Tins

- All empty paint tins are taken to store yard after use at respective places on station,
- Empty containers are placed inside the skip provided outside the workshop,
- Once all the empty paint tins are inside the skip, the lid is then closed,
- Once the skip is full, the stores personnel initiate a call out to the Waste Contractor to come and uplift the skip.
- All empty paint tins are taken to store yard after use at respective places on station,
- Empty containers are placed inside the skip provided outside the workshop,
- Once all the empty paint tins are inside the skip, the lid is then closed,
- Once the skip is full, the store personnel initiate a call out to the Waste Contractor to come and uplift the skip.
- The contractor arrives at the station and proceeds to the store yard.
- At the civil stores, the waste contractor drop-off the empty skip, uplift the full skip and proceed with the full skip.
- The mass of the full skip will be recorded on the invoice as well as on the Safe Disposal Certificate.
- The Invoice, Waste Manifest as well as the Safe Disposal Certificate, to be forwarded to the civil stores personnel who will maintain the copies of the waste manifest and safe disposal certificate and forward the originals to the OHSE & DM for filling.
- Waste contractor shall be audited annually to ensure responsible disposal of waste, as part of the station's cradle to grave concept

7.1.13 PVC, Rubber, scrap wood

- Workshop personnel take all PVC, rubber, scrap wood generated on site to the scrap yard,
- At the scrap yard the personnel offload the PVC, rubber, scrap wood, separate it and place it at the demarcated area,
- Once the PVC, rubber, scrap wood is offloaded the main store is locked to prevent unauthorised entry,
- Once PVC, rubber, scrap wood storage area is full at the main store, Stores Assistant informs the Stores Supervisor,
- Stores Supervisor/Maintenance Manager shall place an order for PVC, rubber, and scrap wood to be removed.
- The service provider arrives at the site and proceeds to the storage area, collect scraps and then proceeds to the main stores,
- At the stores, the service provider goes with the Stores Assistant to the storage area,
- At the storage area, the service provider loads the PVC, rubber, scrap wood to the truck,
- Maintenance Manager issues a gate pass for service provider,
- The service provider proceeds to with full truck of PVC, rubber, scrap wood the mass of full truck will be recorded on the ticket,
- Copy of ticket from the landfill site will be given to the Stores Supervisor/Maintenance Manager; one copy forwarded to the stores personnel who will forward the original to the OHSE & DM for filling,

- Waste contractor shall be audited annually to ensure responsible disposal of waste, as part of the station's cradle to grave concept.

7.1.14 Fluorescent tubes

- The electricians/ electrical workshop assistant of both work areas obtain a defect from planning department to replace faulty/fused fluorescent tubes,
- The electricians/ electrical workshop assistant go to the respective area to replace the faulty tubes,
- Take out the fluorescent tubes that are no longer working; replace them with new tubes,
- Obtain and sign for the key to the crushing area, and take the used tubes to the crushing area,
- At the crushing area the personnel offload the tubes in a demarcated area,
- Fluorescent tubes are crushed into a sealed labelled metal drum situated at electrical workshops in both work areas,
- After crushing, the drums are kept sealed to prevent air pollution,
- After crushing, the crushing area is cleaned and locked; the keys are handed back to the electrical workshop foreman, to prevent unauthorised entry.
- When the fluorescent drums are full the electrician/workshop assistant informs the Electrical Foreman,
- The Electrical Foreman generates an order for the service provider to fetch full drums of crushed fluorescent tubes for disposal,

- The service provider arrives at the site and proceeds to the stores empty drums on truck and then proceeds to the electrical workshop (crushing area),
- At the electrical workshop, the service provider goes with the electrician/workshop assistant to the crushing area,
- At the crushing area, the service provider offloads the empty drums and loads the full drums on the truck,
- After loading the full drums he reports back to the Electrical Foreman,
- The Invoice, Waste Manifest as well as the Safe Disposal Certificate, to be forwarded to the Electrical Foreman who will maintain the copies of the waste manifest and safe disposal certificate and forward the originals to the OHSE &DM section for filling.
- Electrical Foreman issues a gate pass for service provider,
- The service provider proceeds with full drums of crushed fluorescent tubes, the mass of full truck will be recorded on the ticket,
- Copy of ticket will be given to the service provider; one copy forwarded to the Electrical Foreman who will forward the original to the OHSE & DM for filling.
- Waste contractor shall be audited annually to ensure responsible disposal of waste, as part of the station's cradle to grave concept.

7.1.15. Electronic Waste (Printers, Toner Cartridges, fax machines laptops, desktops, phones and cell phones etc.)

- Electronic Waste are taken to Facilities,
- Empty cartridges are taken to Facilities and stored in a box provided by the supplier,

- The Admin Assistant records the cartridges on register (indicating place of origin and number of cartridges),
- Admin Assistant sends the cartridges to Stationary section through pony express on monthly basis (the collector signs the register as proof of collection),
- All JW E- Waste such as computers, electronic equipment, laptops, and phones must be taken to the manufacturer for recycling and safe disposal.
- The Invoice, Waste Manifest as well as the Safe Disposal Certificate, to be forwarded to the civil stores personnel who will maintain the copies of the waste manifest and safe disposal certificate and forward the originals to the OHSE & DM for filling.

7.1.16 Building rubble & Garden Refuse

- All building rubble & garden refuse generated on site is taken behind workshop (temporary storage area),
- On a bi-weekly basis the Depot/Works Manager calls the driver to come and load the building rubble & garden refuse for disposal at a registered Municipal landfill site,
- The driver arrives at the workshop, loads the building rubble & garden refuse to the truck,
- The driver proceeds with full truck of building rubble & garden refuse and ensure that the mass of full truck is recorded on the ticket,
- Then proceeds to the registered landfill site,
- At the landfill site, the mass of a full truck is recorded and the service should receive a receipt.

- Copy of ticket from the landfill site is given to the Depot/Works Manager by the service provider, who will forward the original to the OHSE & DM for filling.

7.1.17 Asbestos Pipes

- Any asbestos containing materials or waste such as asbestos cement sheets, pipes, building materials, equipment, PPE etc.
- Demolition of asbestos work shall be carried out by an approved asbestos contractor with Department of Labour. Only trained personnel shall undertake the work.
- All asbestos work and the disposal thereof must be done in strict accordance with Asbestos Regulation, 2001.
- The Department of Labour shall be notified prior commencement works on site in line with Asbestos regulation of 2001.
- All waste asbestos containing material must be directly put into asbestos double bags
- The bags will then be placed into a lockable asbestos waste bin for safe disposal by an approved hazardous waste contractor
- Asbestos shall be transported by the licensed contractor.
- The transported asbestos must be fixed or double bagged in order to prevent any dangerous fibres from escaping
- All asbestos containing waste must be disposed at an approved hazardous waste disposal site.
- The mass of the full box will be recorded on the invoice as well as on the Safe Disposal Certificate,

- The Invoice, Waste Manifest ,Safe Disposal Certificate as well as the weigh bridge slip, to be forwarded to the stores personnel who will maintain the copies of the waste manifest and safe disposal certificate and forward the originals to the OHSE & DM for the recording purposes.

7.1.18 Papers

- Paper waste includes materials such as newspapers, magazines, office papers which are used for printing, photocopies, plain paper fax's.
- Papers are stored in allocated paper recycling boxes in the offices and workshops
- Confidential documents are to be shredded before removed for recycling and be stored in a refuse plastic bag.
- Papers are collected by an approved contractor that deals with paper recycling
- Papers are removed from site by the paper recycling company/contractor. At the stores, the waste contractor drop-off the empty skip
- The mass of the full box will be recorded on the invoice as well as on the Safe Disposal Certificate,
- The Invoice, Waste Manifest as well as the Safe Disposal Certificate, to be forwarded to the civil stores personnel who will maintain the copies of the waste manifest and safe disposal certificate and forward the originals to the OHSE & DM for filling.

7.1.19 Grit and Screen/s Waste (from the Sewer Waste Water Treatment Plant)

- Any sewer contained materials or waste containing sewer such as plastics, rags, tins, papers, sand and/or stones etc.
- All waste with sewer containing material must be directly put into Skips, which is clearly marked.
- The full skip will then be collected by a service provider for safe disposal by an approved hazardous waste contractor
- Sewer grit and screen waste shall be transported by the licensed contractor,
- All sewers containing waste must be disposed at an approved hazardous waste disposal site.
- The mass of the full skip will be recorded on the invoice as well as on the Safe Disposal Certificate,
- The Invoice, Waste Manifest as well as the Safe Disposal Certificate, to be forwarded to the stores personnel who will maintain the copies of the waste manifest and safe disposal certificate and forward the originals to the OHSE & DM for filling.

7.1.20 Sewer Spillages

- During a spill of sewer, action should be taken immediately to prevent and contain the spill from spreading, contaminating the ground (soil), washed or flow and contaminated the nearest water bodies, infiltrates down and contaminate ground water, washed and enter into the drains,

- Sewer spill kits should be stored on site and JW maintenance personnel should always have it in their cars, that the user can access them easily when needed,
- All relevant sites should have sewer spill kits at the main stores,
- If you discover any spill of any significant proportion that you cannot handle, it must be reported to OSHE & DM section immediately,
- The water in that may be contaminated with sewer, should be sampled, tested and if contaminated, then treated,
- Contaminated soil material shall be stored into 210 L drum,
- The drum has to be labelled with relevant information written onto it,
- The collection of this waste shall be carried out by the registered contractor
- The waste disposal must be done at the registered waste disposal facility,
- The mass of the full drum will be recorded on the invoice as well as on the Safe Disposal Certificate,
- The Invoice, Waste Manifest as well as the Safe Disposal Certificate, to be forwarded to the stores personnel who will maintain the copies of the waste manifest and safe disposal certificate and forward the originals to the OHSE & DM for filling,
- Waste contractor shall be audited annually to ensure responsible disposal of waste, as part of the station's cradle to grave concept.

7.1. 21. Canteen Used Oil

- The Canteen buys cooking oil for the use in kitchen,
- Cooking oil is only used once, once used is decanted into its original containers,

- Once the used oil containers are more than 10 the Kitchen Supervisor informs the Canteen Manager who initiates a call for a service provider to collect the used oil containers,
- Once the service provider arrives on site they proceed to Canteen kitchen,
- Count the full drums of used oil & empty drums,
- Pay (in cash) for the full drums of used oil & empty drums and service provider should issue with invoice & safe disposal letter to the Canteen.
- The invoice & safe disposal letter is forwarded to Facilities for filling.

7.1.22 Human anatomical waste

All human anatomical waste such as blood and body fluids are potentially hazardous.
Human/animal anatomical waste:

Waste consisting of:
Tissues;
Organs;
Body parts;
Products of conception; and
This waste category is divided into the subcategories of:

- Human anatomical waste;
- Infectious animal anatomical waste; or
- Non-infectious animal anatomical waste.

Note: The following are considered to be non-anatomical wastes:
a. Blood and body fluids.
b. Extracted teeth.

c. Nail clippings.

d. Hair

- Only registered and/or accredited service providers shall be used for collection, transportation and disposal of human anatomical waste.
- All anatomical waste collected at the head of works shall be reported and removed appropriately according to its classification.
- The supply shall ensure that a report is obtained from the supplier.

8. ESTIMATES OF WASTE QUANTITIES

The OPEX department and CAPEX contractors shall record waste quantities generated and disposed of. Further, records relating to the safe disposal of waste shall be kept at all times. Both waste quantities and safe disposal records must be sent to the Johannesburg Water Environmental Specialist once received or on a monthly basis. Copies of service provider/s waste permit/s shall be kept on sites, if the contractors do not dispose of the waste themselves. Records of waste quantities must be done on JW Waste quantity register.

The following table illustrates how waste shall be recorded:

Table 2: Waste Quantities generated

Waste	Quantities/volumes generated	Re-use/Recycled	Means of Disposal
Hazardous waste			
Mixed hazardous waste	Any	-	Hazardous Landfill sites
Asbestos and Medical Waste	Any	-	Hazardous Landfill sites and, Medical Centres (clinics and hospitals)
General Waste			
Domestic waste	Any	Yes	General landfill site
Building rubble	Any	Yes	General landfill Sites and donated to local communities or land owners

9. PRINCIPLES

9.1 PREVENTION AND MINIMISATION

This refers to the reduction of the volume of waste during production by means of different processes or clean technology. Waste avoidance, i.e. reducing waste without relying on recycling or re-use, is the most economically and environmentally beneficial waste minimisation option. Whilst, waste minimisation intends to avoid creation of waste before it is produced and reduce its quantity and toxicity. Prevention is the primary goal, followed by reuse, recycling, treatment and appropriate disposal.

The following preventative and/or minimisation measures shall be employed:

- Ensure Compliance to JW WMP and Procedures.
- Regular waste management awareness training,
- Avoid having and the use of materials in excess on sites,
- Ensure that all project sites (contractors) have method statements or WMP
- Take back schemes where an industry must take back the product when it becomes a waste
- Print on both sides of the paper

If it is possible, avoid printing and instead store documents digitally

9.2 PRECAUTIONARY MEASURES

The following precautionary measure shall be employed:

- Procuring of the exact amount of resources and in bulk packages needed to avoid excess materials that may be wasted,
- Ensure that good quality materials (steel, concrete, disposable eating or drinking containers) are purchased to avoid defected materials that may easily be rendered not fit for use,
- Good housekeeping practices.

9.3 REDUCE, REUSE AND RECYCLING

There are a number of waste types that JW generates that can be reduced, reused and recycled. Reduce is all about for instance, oil contaminated soil and waste can be reduced by making sure that construction vehicles are maintained and free of oil leaks. The following reduce; reuse and recycling measures shall be employed:

- Form a relationship with the waste recycling companies located in and around the projects areas
- Set targets for specific waste streams
- Packaging material (i.e. conductor drums and insulator boxes) be given back to supplier or to communities for re-use
- Recycling of paper is important, so is recycling of ink cartridges. Do not throw them away

9.4 TEMPORARY STORAGE

Daily, JW temporarily stores its waste from the point of generation daily and then takes it to the Depots/ Works/ camp sites/projects site offices where it is transferred into bins or skips. The following storage and disposal measures shall be employed:

All waste shall be stored in suitable waste containers.

- All waste receptacles shall be labelled or colour coded so as to ensure that the waste separation and recycling / re-use / disposal requirements are met.
- All waste containers (drums, bins and/or skips) shall be cleaned on a regular basis and records of service shall be maintained in the contractors site file.

- All storage areas shall be demarcated so as to ensure that access is controlled.
- The contractor shall maintain accurate records on file of the volumes / weights of waste streams and date of disposal.
- All hazardous waste shall be stored in sealable impermeable, containers / skips or bunded containment structures.
- All storage containers / skips and bunds shall be maintained to ensure that the risk of polluting the surrounding natural environment is prevented.

9.5 DISPOSAL

- Only registered and/or accredited service providers shall be used for collection, transportation and disposal of hazardous waste.
- All waste generated shall be disposed of according to its classification and only at a registered landfill site.
- The contractor shall ensure that a removal manifest is obtained from the service provider on site.
- The contractor shall ensure that the service provider issues a weigh bridge slip together with a Safe Disposal Certificate within the required time frames of the removal from site.
- The contractor shall maintain a waste register and attach all relevant proof of disposal documentation.

Considering the NEM: WA requirements all waste generated shall be classified and disposed of within 18 months.

9.8 WASTE CLASSIFICATION ACCORDING TO NEM: WA

9.8.1 Waste Classification

Waste generated must be classified in accordance with the Department of Environmental Affairs, Waste Classification and Management Regulations. This classification system shall be done in accordance with SANS 10234 (Globally Harmonized System (GHS)) within one-hundred and eighty (180) days of generation.

9.8.1.1 General and Domestic Waste

These waste types fall within Annexure 1 of Notice 6144 of 2012, NEMWA Waste Classification and Management Regulation and there is no need to classify these waste streams in terms of SANS 10234. The majority of these waste streams will be designated to be re-used, recycled or recovered. See Table below as an example of this.

Table 3: General and Domestic waste classification examples.

Waste Type	Waste Classification
Office kitchen waste	Domestic Solid Waste
Office paper waste	Domestic Solid Waste
Office – other waste i.e. packaging, plastic,	Domestic Solid Waste
Litter and domestic waste in construction camp	Domestic Solid Waste

Scrap Metal	General Solid Waste
Wood packaging waste	General Solid Waste
Scrapped line hardware waste	General Solid Waste
Plastic	Domestic Solid Waste
Building Rubble	General solid Waste
Washed/soaked cement bags	Domestic Solid Waste

9.8.1.2 Hazardous Waste

For the purposes of the GHS (SANS 10234), the classification of substances and mixtures incorporates:

- Identification of the relevant data regarding the hazards;
- Subsequent review of the data to ascertain the associated hazards; and
- A decision on whether the substance or mixture is classifiable as hazardous and the degree of hazard. It is also important to consult the applicable MSDS when classifying hazardous waste.

Table 4: Hazardous waste classification examples

Waste Type	Waste Classification
Oil contaminated soil	Flammable solid
Workshop Wastes (Filters, oily rags etc.)	Flammable solid
Contaminated containers (paint, oil tins etc.)	Flammable solid
Used oil, petrol, diesel etc.	Flammable liquids
Fluorescent light tubes/bulbs (CFLs)	Health Hazards (Acute toxicity)
E-waste (batteries, ink cartridges,	Health Hazards

projectors, printers, computers etc.)	
Corpse, human organs, fetus and dead animals	Health Hazards
Grit and Screen/s	Health Hazards

As stated above the classification of hazardous waste must be done within one-hundred-and eighty (180) days of generation. It is recommended that hazardous waste be collected before the 180 day grace period and that a recognised service provider classifies the waste before disposal thereof.

An agreement must be in place with the service provider detailing this. Proof of such classification and safe disposal must also be provided. It must be noted that should the hazardous waste not be disposed of and classified as detailed above, the necessary steps must be taken to classify the hazardous waste on site according to the GHS before the 180 day grace period is reached.

10. All Employees

- It is the responsibility of all JW Employees to conduct work in an environmental conscientious manner,
- All personnel, including contractors must ensure that waste is disposed into allocated containers which are clearly marked on site,
- Report any hazard or deficiencies in their working environment concerning waste, to their supervisors and/or OHSE &DM section,

- It is the responsibility of all individual departments that generate hazardous waste to ensure that waste drums and/or waste skips are clearly marked and have allocated area,
- Drums/Bins/Skips need to be correctly labelled clearly stating the type of waste and there should be a record with date/s on which accumulation of waste has started.

11. RECORDS AND DATA

Table 5: Records and Data

Doc Ref. No.	Title or Description	Storage Location
	Safe disposal certificates	Waste Contractor
	Weighbridge Slip	Waste Contractor
	Invoices from removal contractor	Waste Contractor
	Monthly report	Responsible Department
	Waste Manifest documents	Responsible Department
	Safe Disposal Certificates	Responsible Department
	Work area gate pass-outs	Responsible Department

12. DOCUMENT REVISION AND CHANGE HISTORY

The owner of this document is responsible for the revision and control of the document and copies thereof, including the updating of the information below, which contains the history of the document with a description of each revision.

Date: 11/05/2018

Revision No. 2

Revision No. 2

Appendix A: Johannesburg Water Waste Register

ANNEXURE 6:

COVID -19 GUIDELINE FOR CONTRACTORS

	SAFETY , HEALTH & ENVIRONMENTAL (SHE) SPECIFICATION	
Johannesburg Water	PROJECT NUMBER:	**JW OPS 024/21**
	PROJECT LOCATION:	**FENNELL ROAD DEPOT- FLOW LABORATORY**
	PROJECT DESCR:	**Supply, installation and commissioning of a gravimetric flow meter test bench at Flow Laboratory (Fennell Road Depot)**

	OCCUPATIONAL HEALTH &SAFETY (SHE) SPECIFICATION: COVID-19	
Johannesburg Water	PROJECT NUMBER:	**JW OPS 024/21**
	PROJECT LOCATION:	**FENNELL ROAD DEPOT- FLOW LABORATORY**
	PROJECT DESCR:	**Supply, installation and commissioning of a gravimetric flow meter test bench at Flow Laboratory (Fennell Road Depot)**

OCCUPATIONAL HEALTH, SAFETY & ENVIRONMENTAL SPECIFICATION

COVID-19 GUIDELINES FOR JOHANNESBURG WATER SOC (JW) CONTRACTORS

Prepared by: OHS Department PO Box 61542 Marshalltown 2107 Tel: +27 11 688 1476	**PRINCIPAL CONTRACTOR:**	
	CEO (16.1 APPOINTEE):	
	TELEPHONE NUMBER:	
	FAX NUMBER	
	E-MAIL ADDRESS:	
	SIGNATURE:	

	OCCUPATIONAL HEALTH &SAFETY (SHE) SPECIFICATION: COVID-19	
Johannesburg Water	PROJECT NUMBER:	**JW OPS 024/21**
	PROJECT LOCATION:	**FENNELL ROAD DEPOT- FLOW LABORATORY**
	PROJECT DESCR:	**Supply, installation and commissioning of a gravimetric flow meter test bench at Flow Laboratory (Fennell Road Depot)**

1. Introduction

The OHSA (Occupational Health and Safety Act – Act 85 of 1993), read with its regulations and incorporated standards, requires the employer to provide and maintain as far as is reasonably practicable a working environment that is safe and without risks to the health of workers and to take such steps as may be reasonably practicable to eliminate or mitigate the hazard or potential hazard.

The OHSA requires employers, to ensure, as far as is reasonably practicable, that all persons who may be directly affected by their activities (such as customers, clients or contractors and their workers who enter their workplace or come into contact with their employees) are not exposed to hazards to their health or safety. This obligation also applies to self-employed persons (for example, plumbers or electricians) whose working activities bring them into contact with members of the public.

2. PURPOSE

The purpose of this document is to give guidance to all contractors conducting work on behalf of JW on the measures to be implemented to safeguard their employees, JW employees, visitors coming to their site as well as the public against COVID-19.

3. MINIMUM REQUIREMENTS TO BE COMPLIED WITH:

3.1. COVID-19 Risk Assessment

Every employer shall develop a risk assessment in relation to COVID-19 which takes into consideration:

- Identification of exposure levels
- Identification of “high contact” activities
- Identification of vulnerable workers and special measures for their protection, including protection against unfair discrimination or victimization

The risk assessment will form part of the safety file that will be evaluated for conformance, and thereafter audited monthly for compliance.

3.2. COVID-19 SOP / Amendment to the SHE plan

- Each employer needs to demonstrate how he or she will comply with the requirements of various COVID-19 legislation.
- The SOP must also outline how the employer will identify employees with comorbidities and measures to be taken.

3.3. Control measures

Control measures will include

3.3.1 Alcohol based sanitizer (70%)

A hand sanitizer must be made available at all sites, and must contain at least 70% alcohol content and is in accordance with the recommendations of the Department of Health.

Every employer must, free of charge, ensure that –

- there are sufficient quantities of hand sanitizer based on the number of workers or other persons who access the workplace at the entrance of, and in, the workplace which the workers or other persons are required to use;
- every employee who works away from the workplace, other than at home, must be provided with an adequate supply of hand sanitizer.
- If a worker interacts with the public, the employer must provide the worker with sufficient supplies of hand-sanitizer at that worker's workstation for both the worker and the person with whom the worker is interacting.

3.3.2 Cloth masks (3 ply)

Every employer must –

- provide each of its employees, free of charge, with a minimum of two cloth masks, which comply with the requirement set out in the Guidelines issued by the Department of Trade, Industry and Competition, for the employee to wear while at work and while commuting to and from work; and
- Require any other worker to wear masks in the workplace.

- Ensure that workers are informed, instructed, trained and instructed as to the correct use of cloth masks.

3.3.3 Hand soap and hygiene facilities

The employer must ensure that-

- there are adequate facilities for the washing of hands with liquid hand soap and clean water;
- only paper towels are provided to dry hands after washing – the use of fabric towels is prohibited;
- the workers are required to wash their hands and sanitize their hands regularly while at work;
- the workers interacting with the public are instructed to wash or sanitize their hands between each interaction with public;

3.3.4 Engineering controls

Every employer must –

- keep the workplace well ventilated by natural or mechanical means to reduce the SARS-CoV-2 viral load;
- where reasonably practicable, have an effective local extraction ventilation system with high-efficiency particulate air HEPA filters, which is regularly cleaned and maintained, and its vents do not feedback in through open windows;
- Ensure that filters are cleaned and replaced in accordance with the manufacturer's instructions by a competent person.
- Every employer must arrange the workplace to ensure minimal contact between workers and as far as practicable ensure that there is a minimum of 1.5m between workers while they are working, for example, at their workstations.
- If it is not practicable to arrange work stations to be spaced at least 1.5m apart, the employer must-
- Arrange physical barriers to be placed between work stations or erected on work stations to form a solid physical barrier between workers while they are working

3.3.5 Social distancing protocol

- Every employer must arrange the workplace to ensure minimal contact between workers and as far as practicable ensure that there is a minimum of 1.5m (metres) between workers while they are working, for example, at their workstations.
- Depending on the circumstances of the workplace or the nature of the sector, the minimum distance may need to be longer.
- Reducing the number of workers present in the workplace at any time may assist in achieving the required social distancing.
- Employers therefore need to identify work that can be performed remotely / at home in order to reduce the number of employees coming physically to the work environment.
- Every employer must arrange the workplace to ensure minimal contact between workers and as far as practicable ensure that there is a minimum of 1.5m between workers while they are working, for example, at their workstations.
- If it is not practicable to arrange work stations to be spaced at least 1.5m apart, the employer must-
- arrange physical barriers to be placed between work stations or erected on work stations to form a solid physical barrier between workers while they are working; or
- Supply the employee free of charge with appropriate PPE based on a risk assessment of the working place.

The employer should develop a protocol on social distancing which will include:

- No handshakes
- No hugs
- No kissing
- No horseplay
- No touching each other
- Minimum of 1.5m distance between two employees during work, meetings, lunch, etc.
- Installation of physical screens in the workplace to separate workstations

- Minimum number of people allowed in the vehicles during transportation

All the requirements above should be observed in conjunction with wearing of masks and regular handwashing and sanitizing.

3.3.6 Cleaning and disinfection

Every employer must take measures to ensure that-

- all work surfaces and equipment are disinfected before work begins, regularly during the working period and after work ends;
- all areas such as toilets, common areas, door handles, shared electronic equipment are regularly cleaned and disinfected;
- Disable biometric systems or make them COVID-19-proof.
- Surfaces that workers and members of the public come into contact with are routinely cleaned and disinfected.
- There is provision for the disinfection of the premises in the event that an employee tests positive at work.

4. Employees above the age of 60, and those with comorbidities

- The employer shall identify all comorbidities that will increase the severity of COVID-19 should employees with them be infected.
- The employer should identify whether those employees will work fully from home or on a rotational basis with full PPE and other prevention and control measures observed.
- Employees over the age of 60 must also be identified and work from home.

5. Special provisions

- The employer must appoint a compliance officer to ensure compliance with these requirements.
- The compliance officer will also address employee or workplace representative concerns and to keep them informed and, in any workplace in which a health and

safety committee has been elected, consult with that committee on the nature of the hazard in that workplace and the measures that need to be taken;

- The employer must ensure that all relevant legal requirements and the risk assessment plan are strictly complied with through monitoring and supervision;
- The employer must, as far as practicable, minimize the number of workers on at the workplace at any given time through rotation, staggered working hours, shift systems, remote working arrangements or similar measures in order to achieve social distancing.
- Take measures to minimize contact between workers as well as between workers and members of the public;
- Notify employees that if they are sick or have symptoms associated with COVID–19 that they must not come to work and to take paid sick leave in terms of section 22 of the BCEA.
- Display notices advising persons other than employees entering the workplace of the precautions they are required to observe while in the workplace;

If an employee has been diagnosed with COVID-19, the employer must-

- Inform the Department of Health and the Department of Employment and Labour using the WCL1 form;
- Investigate the cause including any control failure and review the risk assessment to ensure that the necessary controls and PPE requirements are in place;
- Give administrative support to any contact-tracing measures implemented by the Department of Health.

Symptom screening

Every employer must take measures to-

- Screen any worker, at the time that they report for work, to ascertain whether they have any of the observable symptoms associated with COVID-19, namely fever, cough, sore throat, redness of eyes or shortness of breath (or difficulty in breathing);

- Require every worker or visitor to report whether they suffer from any of the following additional symptoms: body aches, loss of smell or loss of taste, nausea, vomiting, diarrhoea, fatigue, weakness or tiredness; and
- Require workers to immediately inform the employer if they experience any of the symptoms above while at work.

If a worker presents with those symptoms, or advises the employer of these symptoms, the employer must –

- not permit the worker to enter the workplace or report for work; or
- if the worker is already at work, immediately-
    - isolate the worker, provide the worker with a FFP1 surgical mask and arrange for the worker to be transported in a manner that does not place other workers or members of the public at risk either to be self-isolated or taken for a medical examination or testing; and
    - assess the risk of transmission, disinfect the area and the worker's workstation, refer those workers who may be at risk for screening and take any other appropriate measure to prevent possible transmission;
    - ensure that the worker is tested or referred to an identified testing site;
    - place the employee on paid sick leave in terms of section 22 of the BCEA or if the employee's sick leave entitlement under the section is exhausted, make application for an illness benefit in terms of clause 4 of the Directive issued on 25 March 2020 on the COVID-19 Temporary Employer Relief Scheme under regulation 10(8) of the Regulations promulgated in terms of section 27(2) of the Disaster Management Act;
    - ensure that the employee is not discriminated against on grounds of having tested positive for COVID-19 in terms of section 6 of the Employment Equity Act, 1998 (Act No. 55 of 1998);
    - If there is evidence that the worker contracted COVID-19 as a result of occupational exposure, lodge a claim for compensation in terms of the Compensation for Occupational Injuries and Diseases Act, 1993.

6. PROCEDURES TO BE FOLLOWED ON SITE

6.1 ENTRY AND EXIT ON THE SITE CAMP

- The security personnel who will be trained in the procedures will do daily screening via questionnaire for every employee and visitor entering the site.
- Temperature checks will be done by security personnel using non-contact infrared thermometer.
- Every employee who records a temperature above 38°C will be sent home to seek for medical help.
- No employee or visitor who answers any question by yes on the questionnaire should be granted access into the site premises.
- Report to the site manager daily

6.2 MEETING ATTENDANCE

BEFORE the meeting or event

- Check the advice from the authorities in the community where you plan to hold the meeting or event. Follow their advice.
- Develop and agree a preparedness plan to prevent infection at your meeting or event.
    - Consider whether a face-to-face meeting or event is needed. Could it be replaced by a teleconference or online event?
    - Could the meeting or event be scaled down so that fewer people attend?
    - Ensure and verify information and communication channels in advance with
    - Pre-order sufficient supplies and materials, including face masks, hand soap, tissue and hand sanitizer for all participants.
- Develop and agree a response plan in case someone at the meeting becomes ill with symptoms of COVID-19 (dry cough, fever, malaise). This plan should include at least:
- Identify a room or area where someone who is feeling unwell or has symptoms can be safely isolated.
- Have a plan for how they can be safely transferred from there to a health facility.

- Know what to do if a meeting participant, staff member or service provider tests positive for COVID-19 during or just after the meeting
- Agree the plan in advance with your partner healthcare provider or health department.

DURING the meeting or event

- Provide information or a briefing, preferably both orally and in writing, on COVID-19 and the measures that organizers are taking to make this event safe for participants.
  - Encourage regular hand-washing or use of an alcohol rub by all participants at the meeting or event
  - Encourage participants to cover their face with the bend of their elbow or a tissue if they cough or sneeze. Supply tissues and closed bins to dispose of them in.
  - Provide contact details or a health hotline number that participants can call for advice or to give information.
- Display dispensers of alcohol-based hand rub prominently around the venue.
- If there is space, arrange seats so that participants are at least one meter apart.
- Open windows and doors whenever possible to make sure the venue is well ventilated.
- If anyone who starts to feel unwell, follow your preparedness plan.

AFTER the meeting

- Retain the names and contact details of all participants for at least one month. This will help public health authorities trace people who may have been exposed to COVID-19 if one or more participants become ill shortly after the event.
- If someone at the meeting or event was isolated as a suspected COVID-19 case, the organizer should let all participants know this. They should be advised to monitor themselves for symptoms for 10 days and take their temperature twice a day.
- If they develop even a mild cough or low-grade fever (i.e. a temperature of 38 C or more), they should stay at home and self-isolate. This means avoiding close contact (1 meter or nearer) with other people, including family members. They should also telephone their healthcare provider or the local public health department, giving them details of their recent travel and symptoms.

7. Identifying contacts

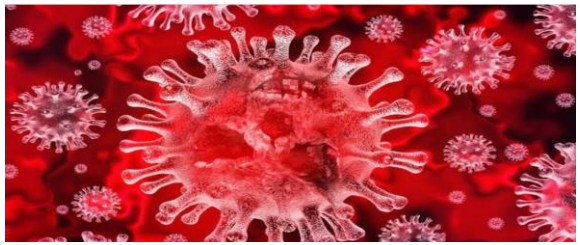
To identify contacts, a detailed case investigation and interview with the COVID-19 patient or their caregiver must be conducted.

Environment	Criteria	Ways to identify contacts
Known/identifiable contacts		
Workplace **(Immediate colleagues)**	Any employees who had: ✓ Face-to-face contact with a COVID 19 patient within 1 metre and for >15 mins ✓ Direct physical contact with a COVID-19 patient ✓ Provided direct care for a COVID-19 patient in the workplace without proper PPE ✓ Shared working space or equipment with a COVID 19 patient ✓ Shared a room, meal, or other space with a confirmed patient	✓ Direct interview with the COVID-19 patient and/or their caregiver(s). ✓ Direct interview with all employees and supervisors ✓ Interview can also be done telephonically
Workplace **(Visitors / suppliers)**	✓ All visitors who visited the site within the 2 week period and were potentially in contact with the infected employee	✓ Daily signing registers ✓ Meeting attendance registers

This information will be shared with the health authorities so that they can be able to do household, community, social and contact tracing for all contacts associated with a contact

- Where possible, the Project / Construction Manager should check in with contacts to make sure they are self-monitoring and have not developed symptoms.
- Contacts who develop symptoms should promptly isolate themselves and notify the NICD.
- They should be promptly evaluated for infection and for the need for medical care.

COVID-19 SOP: MANAGEMENT OF POSITIVE CASES



Employee tests positive for COVID-19

Employee reports to line manager (sends results via sms / lab certificate)

Manager helps employee identify close contacts and sends to CO & CHSO

Premises shut down for disinfection (deep cleaning)

Premises reopen and all non-contacts can continue working

Preliminary investigation is done by Supervisor & CO & CHSO

Compliance Officer & Safety Officer complete WCL1 and send to DOL

NICD HOTLINE: 0800 029 999

Employee goes for isolation for 10 days or more, depending on the symptoms and severity of illness

Contacts go on quarantine for 10 days, depending on and look out for the development of symptoms

If any contact develops symptoms during quarantine, they must report to the line manager who will arrange for testing

If employee tests positive, the process will start from the beginning

At the end of isolation period, employees go to their doctor to get a certificate of fitness for work

Upon return to the workplace, Compliance Officer will organise a debriefing for the affected section

A final investigation is done by Supervisor & CO & CHSO & employees; lessons learned are compiled

ANNEXURE 7: COVID-19 RISK ASSESSMENT FOR CONTRACTORS

	COVID 19 RISK ASSESSMENT FOR CONTRACTORS	
Johannesburg Water	PROJECT NUMBER:	JW OPS 024/21
	PROJECT LOCATION:	FENNELL ROAD DEPOT- FLOW LABORATORY
	PROJECT DESCR:	Supply, installation and commissioning of a gravimetric flow meter test bench at Flow Laboratory (Fennell Road Depot)

Activity	Hazard	Risk	Consequence	Who may be exposed	Rating	Controls
Coming to site / leaving site	Public transport	Contact with infected public members; Contact with contaminated surfaces;	Spreading / Contracting COVID 19; Fatalities	Contractor's employees,	H	✓ Employer to provide employees with reliable transportation; ✓ Regular disinfection and sanitizing of all vehicles; ✓ Employees to adhere to the social distancing protocol; ✓ Employees to wash their hands regularly (before getting into the car and after exiting) and put on masks. ✓ Ensure proper ventilation in the vehicle by opening the windows
Entering construction site	Contaminated surfaces	Physical contact with contaminated surfaces	Contracting COVID 19; Fatalities	Contractor's employees, Suppliers, Visitors JW employees, Consultants	H	✓ Conduct daily screening through a questionnaire and thermometer to assess the risk of COVID 19 in the workplace ✓ Hand washing for 20 seconds with running water and soap; ✓ Provide employees with clean running water for handwashing. ✓ Regular disinfection and sanitizing of surfaces ✓ Regular awareness on COVID 19 transmission and prevention; ✓ Employees to refrain from touching their faces and wash their hands regularly;

	Infected employees	Physical contact with infected employees	Contracting COVID 19; Fatalities	Contractor's employees, Suppliers, Visitors, JW employees, Consultants	**H**	✓ Handwashing for 20 seconds with running water and soap; ✓ Regular disinfection and sanitizing of surfaces ✓ Regular awareness on COVID 19 transmission and prevention;
Entering a construction site	Infected employees	Droplet spread from infected persons	Contracting COVID 19; Fatalities	Contractor's employees, Suppliers, Visitors, JW employees, Consultants	**H**	✓ Regular screening of employees; ✓ Provide employees with face masks; ✓ Employees to refrain from touching their faces and wash their hands regularly; ✓ Teach employees to cough inside their elbow or tissue and wash their hands or sanitize immediately afterwards. ✓ Employees to report to management if they are feeling sick; especially if they have flu-like symptoms, fever or sore throat.
Lunch	Contact with other employees	Contact with source of infection	Spreading / Contracting COVID 19; Fatalities	Contractor's employees, JW employees, Consultants	**H**	✓ Practice social distancing of up to 2m (but not less than 1m) between two people; ✓ Teach employees to cough inside their elbow or tissue and wash their hands or sanitize immediately afterwards;
	Sharing of food	Contact with source of infection	Spreading / Contracting COVID 19; Fatalities	Contractor's employees	**H**	✓ Discourage employees from sharing lunch and having contact with each other;

	COVID 19 RISK ASSESSMENT FOR CONTRACTORS	
Johannesburg Water	PROJECT NUMBER:	JW OPS 024/21
	PROJECT LOCATION:	FENNELL ROAD DEPOT- FLOW LABORATORY
	PROJECT DESCR:	Supply, installation and commissioning of a gravimetric flow meter test bench at Flow Laboratory (Fennell Road Depot)

Meeting attendance	Infected persons	Physical contact with other employees	Contracting COVID 19; Fatalities	Contractor's employees, Suppliers, Visitors, JW employees, Consultants	**H**	✓ Minimise face to face contact by introducing virtual communication such as Skype, Zoom, Teams, etc; ✓ Avoid handshakes, hugs and sharing food; ✓ Practice social distancing of at least 1m apart. ✓ Employees to report to management if they are feeling sick; especially if they have flu-like symptoms, fever or sore throat.
		Droplet spread from infected persons	Contracting COVID 19; Fatalities	Contractor's employees, Suppliers, Visitors, JW employees, Consultants	**H**	✓ Minimise face to face contact by introducing virtual communication such as Zoom, Teams, etc; ✓ Practice social distancing of at least 1m apart. Teach employees to cough inside their elbow or tissue and wash their hands or sanitize immediately afterwards.
Visitors entering site	Infected visitors; Contact with contaminated surfaces	Droplet spread from infected persons; Physical contact with contaminated surfaces;	Spreading / Contracting COVID 19; Fatalities	Contractor's employees, Suppliers, Visitors, JW employees, Consultants	**H**	✓ Induction of all visitors to ensure that they are aware of the COVID 19. ✓ Screening of visitors through a questionnaire and thermometer to assess the possible prevalence of COVID 19 in the workplace; ✓ Sanitize visitors hands upon entry, and upon exiting the site camp or construction site.
Working in the office	Limited working space	Contact with infected employees and cough or sneeze droplets	Spreading / Contracting COVID 19; Fatalities	Contractor's employees, Visitors, JW employees, Consultants	**H**	✓ Erect physical barriers between employees sharing an office; ✓ Provide at least 1m distance between workstations;

						✓ Teach employees to cough inside their elbow or tissue ✓ Employees to practice proper personal hygiene ✓ Face masks to be provided and worn
Working outside	Contact with other employees	Contact with infected employees and cough or sneeze droplets	Spreading / Contracting COVID 19; Fatalities	Contractor's employees, JW employees, Consultants	**H**	✓ Practice social distancing of up to 2m (but not less than 1m) between two people; ✓ Teach employees to cough inside their elbow or tissue and wash their hands or sanitize immediately afterwards; ✓ Provide employees with face masks, clean water and sanitizer; ✓ Regular awareness on COVID 19 transmission and prevention; ✓ Employees to refrain from touching their faces and wash their hands regularly; ✓ Teach employees to cough inside their elbow or tissue and wash their hands or sanitize immediately afterwards. ✓ Employees to report to management if they are feeling sick; especially if they have flu-like symptoms, fever or sore throat.
Employee selection	Old age	High susceptibility to COVID 19; Comorbidities such as high	Fatalities	Old employees		✓ Ensure that all employees are below the age of 60 ✓ Reduce exposure to employees above the age of 50 by allowing them to work from home at least twice a week.

		blood pressure, diabetes				✓ Medical screening of all employees prior to work

ANNEXURE 8: SIGN OFF FORM

SHE CONTRACTORS' MANAGEMENT SYSTEM				
TENDER DOCUMENT SHE SPECS SIGN-OFF FORM				Johannesburg Water
REQUESTED BY	**Nosipho Mokoena**	**DATE**	**14/6/2022**	**JW OPS 024/21**

JW OPS 024/21: Supply, installation and commissioning of a gravimetric flow meter test bench at Flow Laboratory (Fennell Road Depot)

LIST OF SHE SYSTEM ATTACHED TO THE TENDER DOCUMENT

SHE SYSTEM ATTACHED	Y/N	VERSION	NO PAGES	REMARKS
Volume 2 SHE Specification	Y	V2 – 01/16	47	For info
SHE Contractor's Competency Form	Y	V01 – 01/12	06	For info
Baseline Risk Assessment	Y	V01 – 05/15	02	For info
Acknowledgement of SHE Specification & Annexures	Y	V01 – 01/12	01	Return with tender documents
Medical Screening Policy	Y	V01 – 05/15	07	For info
COVID-19 Risk Assessment	Y	V01-04/20	4	For info
COVID 19 Guidelines	Y	V02-08/20	11	For info
Waste management Plan	Y	V01-	52	For info
Environmental management Plan	Y	V2.5-07/20	113	For info

NB* All documents shall be returned with the tender documents and copies thereof to be submitted with the safety file by the successful bidder.