Report No: 24/06/19/ES/EnvAudit_Shongweni WML LF
Report version: Final

EXTERNAL WASTE MANAGEMENT LICENCE COMPLIANCE AUDIT REPORT: ENVIROSERV – SHONGWENI LANDFILL SITE

June 2019

Prepared by:

DÖRËAN ENVIRONMENTAL

Prepared for:

ENVIROSERV
WASTE MANAGEMENT

ENVIRONMENTAL AUDITOR

Dorean Environmental Services cc
501 Railway Street ext.
Brits
0250

P.O. Box 4643
Brits
0250

Tel: (083) 294 3422
Fax: (086) 690 4878
E-mail: monty@dorean.co.za

CLIENT

EnviroServ Waste Management (Pty) Ltd
1 Brickfield Road
Meadowdale
1401

P.O. Box 1547
Bedfordview
2008

Tel: (011) 456 5400
Fax: (086) 505 3874
Email: Greg@enviroserv.co.za

PROJECT DETAILS

Ref Numbers:	**12/9/11/L1200/4**
TITLE:	**External Environmental Audit Report: Waste Management Licence conditions for EnviroServ – Shongweni Landfill Site**
AUTHOR:	**Monty van Eeden**
CLIENT:	**EnviroServ Waste Management (Pty) Ltd**
DOREAN REPORT NUMBER:	**24/06/19/ES/EnvAudit_Shongweni WML LF**

.....
Monty van Eeden
Environmental Auditor
Managing Member

EXECUTIVE SUMMARY

The on-site visit of the Shongweni Landfill Site was undertaken by Dorean Environmental Services on Monday 24 June 2019. This was part of the annual audit for 2019 undertaken in terms of the licence issued in terms of the National Environmental Management: Waste Act, 2008 (Act no 59 of 2008). The licence is numbered 12/9/11/L1200/4.

Due to the design, engineering controls and expertise of the staff, the Shongweni Landfill Site does not pose a significant environmental risk to the environment. The facility is showing compliance to its licence conditions and the main conclusions from the audit are:

(i) Waste disposal re-commenced in October 2018.

(ii) The types of waste that may be disposed is limited by the amended compliance notice issued in 2017 – inorganic waste that does not contain sulphur.

(iii) Two internal audits are specified in the licence and these have been conducted and the reports made available to the external auditor.

(iv) One external audit per annum is specified in the licence and was undertaken as required. The resultant report has been submitted as required.

(v) A review of the licence is planned for later in the year since the licence is 5 years old and the requirements of condition 14.7 requires a review in year 5.

(vi) Methane in buildings and SSGP monitoring has been carried out as required by the licence. This was conducted by Geozone – only one SSGP (17B) shows elevated H_2S levels - 38 ppm

(vii) Ground- and surface water monitoring was conducted by Jones and Wagner as required by this licence, the last available monitoring report is dated July 2018.

(viii) Water monitoring was conducted by Jones and Wagner in July 2018 was in accordance with the Water Monitoring Protocol numbered JW136/10/B196 Rev00. This protocol has been updated and the updated protocol submitted to the DEA on 18 March 2019 for approval.

(ix) The liquid management model was updated on a monthly basis by Jones and Wagner and submitted to the DEA biannually as required.

(x) Biomonitoring of the Mgoshongweni stream was conducted by GroundTruth in May 2019 but this report is still in draft. This report contains findings of the river eco-system after the flood of 22 April 2019.

(xi) No significant (reportable) spillages relating to waste disposal occurred in the period under review.

(xii) A significant storm occurred on the 22nd of April 2019 which did cause the storm water structures to overflow. This event far exceeded the one in fifty year rain event. This resulted in a minor overflow of the storm water collection ponds. The event and overflow were reported to DEA and the Ethekwini Metro. Monitoring of the river both

upstream and downstream of the site showed very little impact from the flood event. The data showed that all samples complied with the general limit for discharging waste water into a water resource.

(xiii) There was a significant reduction in external complaints received.

(xiv) Monitoring Committee meetings have been conducted as required by the Waste Management Licence.

Table of Contents

1. INTRODUCTION

The Shongweni H:h Landfill Site was originally permitted in terms of section 20 (1) of the Environmental Conservation Act, 1989 (Act 73 of 1989) to accept hazardous waste of Hazard Groups 3 and 4 and delisted waste for co-disposal with domestic waste. The original permit for this site, B33/1/1920/P71, was revised and permit number 16/2/7/U602/B3/Y1/P270 was issued on the 28th August 1997. Subsequently, a major revision of this permit was issued on the 28 August 2005. In addition, amendments to condition 7.2.2.2 were made in a letter dated the 28 December 2005 and conditions 4.2.5, 4.5.3 and 11.2 in a letter dated 7th August 2007.

After the publication of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEMWA), the permit originally issued the Shongweni Landfill Site was converted to a Waste Management Licence, No 12/9/11/L1200/4, on the 4th of April 2014.

In addition, the publication of regulations and standards governing the management of hazardous and other waste were promulgated on the 23rd August 2013 and replaced the Minimum Requirements. These new regulations and standards were implemented immediately on the date of publication. Among the important changes in the regulations, a new approach to both the classification of hazardous wastes and a revised classification system for landfill sites were introduced. The Shongweni Landfill is now designated as a Class A Landfill and may accept Type1 to Type 4 Wastes.

Dorean Environmental Services CC was appointed by EnviroServ to conduct their annual external audit. The on-site audit was conducted on Monday 24 June 2019 at the facility at Shongweni. This document serves as a report on the audit conducted and EnviroServ's compliance with the Waste Management Licence and amendments.

In the period under review, Shongweni Landfill site has complied with the requirements of all provisions of the Waste Management Licence. Although a number of malodour complaints were received, the number of complaints had reduced compared to the previous reporting period.

2. OUTLINE OF ENVIRONMENTAL REQUIREMENTS

National environmental legislation, local by-laws, the requirements of EnviroServ's Environmental Management System and the conditions as set out in the Waste Management Licence must at all times be complied with. This audit was based only on the Shongweni Landfill

Site's Waste Management Licence and subsequent amendments. The Licence number is: 12/9/11/L1200/4

3. AUDIT OBJECTIVE, SCOPE AND CRITERIA

The ***objective*** of the audit is to determine whether or not EnviroServ Waste Management (Pty) Ltd is managing the Shongweni Site in compliance with the conditions as set out in its Waste Management Licence.

The ***scope*** of the audit encompassed the actual Shongweni Landfill facility and its associated activities within the requirements of the Waste Management Licence. The audit was conducted by an independent external auditor and thus un-biased observations and findings are reported.

Criteria guiding the external audit was the Waste Management Licence authorised by the Department, of Environmental Affairs (DEA).

4. AUDIT METHODOLOGY

The external audit was undertaken by an auditor from Dorean Environmental Services CC. The audit approach was independent and holistic. The compliance to audit criteria – in this case the Waste Management Licence, was verified by a site visit, reviewing and collection of applicable documentation, records and reports as well as employee interviews.

The audit purpose was to ascertain the *status quo* of EnviroServ's compliance to the Waste Management Licence and not necessarily rating the company's performance. Audit findings are simply reported as either: Full compliance, Partial compliance, Non-compliance or Not Applicable where:

- **Full compliance** is allocated to aspects complying fully with the applicable requirement;
- **Partial compliance** is allocated to aspects complying partially with the applicable requirement; and
- **Non-compliance** is allocated to aspects not complying with the applicable requirement.

- **Not applicable** is allocated to requirements not / not yet activated by the Licence holder's activities for the period under review. This period for the purpose of this report is August 2018 to June 2019.

5. AUDIT FINDINGS

The audit findings are the result of the evaluation of the collected evidence against Waste Management Licence criteria. The audit was conducted by verifying whether EnviroServ's Shongweni Landfill Site is complying with the set conditions in the Waste Management Licence and that proof of this compliance is available. Audit findings and observations of general operational aspects of the facility follow in different sub-sections below.

5.1 Site security and access control

5.1.1 Requirements:

Section 1.3.1 of the Waste Management Licence (Ref No. 12/9/11/L1200/4), dated 08-04-2014:

- *"1.3.1 The Licence Holder must ensure effective access control of the waste management facility to prevent unauthorised entry. Weatherproof, durable and legible signs in English and Zulu must be displayed at each entrance to the Site. The signs must indicate the risks involved in entering the Site, state the hours of operation and the name, address and telephone number of the Licence Holder and the person responsible for the operation of the Site"*

5.1.2 Rating:

The site complies with the signage requirements. Durable weatherproof signs are put up at the main gate for both the landfill and the treatment plant. The site is also fenced and regular patrols are conducted to ensure any damage to site is fixed as a matter of urgency. Twenty four hour security is present at the gate. Language requirements are also complied with. Plates 1 and 2 shows the signage at the entry to the site.

Plate 1: Signage

Plate 2: Other signage

Rating: Full Compliance.

5.1.3 Requirements:

Section 1.3.2 of the Waste Management Licence (Ref No. 12/9/11/L1200/4), dated 08-04-2014:

- *"1.3.2 The Licence Holder must prevent the disposal of waste that is not authorized at the Site"*

5.1.4 Rating:

The licence holder only disposes waste that is authorised for this site. The waste assessment process and sampling at the gate and testing in the laboratory on site prior to disposal ensures this process. No waste was received on site during the previous audit reporting period due to a High Court interdict that was in place. The High Court interdict was lifted on 21 June 2018, and the directive modified and suspension notice relaxed on 9 December 2017. Waste disposal re-commenced in October 2018. The volumes of waste disposed in the period under review is shown in Table 1

Table 1: Volumes of waste received in the period under review

Month	Tons
October 2018	516
November 2018	732
December 2018	467
January 2019	599
February 2019	913
March 2019	1858
April 2019	2693
May 2019	4218
June 2019	2319

Rating: Full Compliance

5.2 General management

5.2.1 Requirements:

Section 2.1.1 of the Waste Management Licence (Ref No. 12/9/11/L1200/4), dated 08-04-2014:

- *"2.1.1 The activities shall be managed and operated:*
  - *a) In accordance with a documented Environmental Management System (EMS), that inter alia, identifies and minimises the risk of pollution, including those arising from operations, maintenance, accidents, incidents and non-conformance as well as those drawn to the attention of the Licence Holder as a result of complaints;*
  - *b) In accordance with conditions of this Licence and any other written instruction by the Director; and*
  - *c) By an adequate, competent staff complement."*

5.2.2 Rating:

2.1.1 a) EnviroServ operates a comprehensive Safety, Health, Environmental and Quality (SHEQ) system. More specifically to environmental performance, the organisation has an ISO 14001:2015 certified environmental management system (EMS) which is audited both internally and externally on a regular basis and certified by BSI (Certificate number EMS 631298 **Appendix A**). The current certificate is valid until 14 September 2021. As part of the EMS and operations, there have been numerous operational procedures developed, reviewed and maintained over the years.

2.1.1 b) The landfill site is operated according to the requirements of the Waste Management Licence but a directive was issued by the DEA following malodour complaints in the previous period under review. A court order was obtained by the complainants and no waste disposal activities have been taking place on site since

April 2017. The directive has been lifted in December 2017. Currently the site is accepting waste under scheduled trade permit ST3064.

2.1.1 c) An adequate and competent staff component (52 employees including security) subscribes to the requirements of the Licence and the EMS. These employees are all suitably trained for the various positions at the landfill including control of hazardous substances, environmental awareness and HAZOP training. Records of training was available during the audit.

Rating: Full Compliance

5.2.3 Requirements

Section 2.1.2 of the Waste Management Licence (Ref No. 12/9/11/L1200/4), dated 08-04-2014:

- *"2.1.2 Any persons having duties that are or may be affected by this Licence must have convenient access to a copy thereof, which copy must be kept at or near the place where those duties are carried out."*

5.2.4 Rating:

The License is accessible to all those staff directly involved with the activities at the Shongweni Landfill. It is kept in the office and on notice boards at the Landfill site. The licence is also available on the company's intranet.

Rating: Full Compliance

5.2.5 Requirements

Section 2.1.3 of the Waste Management Licence (Ref No. 12/9/11/L1200/4), dated 08-04-2014:

- *"2.1.3 A copy of this Licence may be published by the Department, in its discretion on any website or other media."*

5.2.6 Rating:

This is a function of the Department and is not applicable for the purposes of this report.

Rating: Not Applicable

5.3 Designation of a waste Management Control Officer

5.3.1 Requirements:

Section 2.2 of the Waste Management Licence (Ref No. 12/9/11/L1200/4), dated 08-04-2014:

- *"2.2.1 A Waste Management Control Officer (WMCO) must be designated to monitor and ensure compliance and correct implementation of all mitigation measures and provisions as stipulated in the licence and standard operation procedures. The WMCO must:*
  - *(a) Report any non-compliance with any Licence conditions or requirements or provisions of NEM:WA to the licencing authority.*
- *2.2.2 The duties and responsibility of the WMCO should not be seen as exempting the Licence Holder from any other legal obligations in terms of the NEM:WA*

5.3.2 Rating:

Mr Bongani Zondo was appointed as the WMCO on 11-07-2018. The appointment highlights the responsibilities as set out in the Waste Management Licence. A copy is attached hereto as **Appendix B**.

Rating: Full Compliance

5.4 Emergency preparedness plan

5.4.1 Requirements

Section 2.3.1 of the Waste Management Licence (Ref No. 12/9/11/L1200/4), dated 08-04-2014:

- *"2.3.1 The Licence Holder must maintain and implement an emergency preparedness plan and review it annually when conducting an audit, after each emergency incident and major accident. The plan must, amongst others, include measures to address:*
  - *a) Power failure;*
  - *b) Equipment malfunction;*
  - *c) Site fires;*
  - *d) Spillage (on Site);*
  - *e) Natural disasters such as floods; and*
  - *f) The plan must include contact details of the nearest police station, ambulance services and the emergency centre."*

5.4.2 Rating:

EnviroServ complies with this requirement by having a documented certified EMS in place. Emergency preparedness and response forms a major component of the EMS. The organisation therefore has a comprehensive emergency procedure in place. The following emergencies have been catered for in one combined procedure EWM-SHONG-LF-WI-006, revision 14, dated 22-10-2018. This procedure caters for:

Power failure

Equipment malfunction

Site fires

Spillage on site

Industrial action

Natural disasters

The procedure contains the respective contact numbers for authorities dealing with specific emergencies. Emergency scenarios are also tested in the form of emergency drills on a regular basis and the results of these drills are used to refine and enhance the existing emergency plans through the lessons learned during the drills. The emergency procedure is reviewed at least once in 12 months. The last emergency drill was conducted on 14 June 2019 – a fire in the canteen was simulated.

A significant storm occurred on the 22nd of April 2019 which did cause the storm water structures to overflow. This event far exceeded the one in fifty year rain event. This resulted in a minor overflow of the storm water collection ponds. The event and overflow was reported to DEA and the Ethekwini Metro. Please see **Appendix H** for the communication to the authorities. Monitoring of the river both upstream and downstream of the site showed very little impact from the flood event. The data showed that all samples complied with the general limit for discharging waste water into a water resource.

Rating: Full Compliance

5.5 Permissible waste

5.5.1 Requirements

Sections 3.1 and 3.2 of the Waste Management Licence (Ref No. 12/9/11/L1200/4), dated 08-04-2014:

- *"3.1 Any portion of the Site which has been constructed or developed according to condition 4 of this licence, excluding Cell 0, maybe used for the waste activities listed above.*

- *3.2 The classification, acceptance and disposal criteria as listed in the latest edition of the document "Minimum Requirements for Handling, Classification and Disposal of Hazardous Waste, Waste Management Series, Department of Water Affairs and Forestry" or its successor must be conformed to."*

5.5.2 Rating:

The Shongweni Landfill is designated as a Class A Landfill and can accept Type1 to Type 4 Wastes. The landfill site only accepts these types of waste. Acceptance and disposal criteria are updated. Revised classification procedures have been published by the Department on the 23rd August 2013 (GG 36784: R635) that supersede those in the Minimum Requirements. Discussions with the staff members showed that the requirements of the new regulations and standards have been implemented for the waste streams. Valley 2 cell 2 is currently being used for waste activities. The requirements of the modified directive from the DEA are also applicable to this requirement.

Rating: Full Compliance

5.6 Construction of the site

5.6.1 Requirements

Section 4 of the Waste Management Licence (Ref No. 12/9/11/L1200/4), dated 08-04-2014:

- *"4.1 The construction of further development within the Site may only be undertaken by the Licence holder after Specified engineering plans have been submitted for approval and approved by the Director.*
- *4.2 The design designs must only be changed under the supervision of a registered professional engineer and upon approval by the Director*
- *4.3 The construction of further developments within the Site must be carried out under the supervision of a Professional Registered Engineer*
- *4.4 After construction of the disposal site or future development within the Site, the Professional Registered Engineer must submit a letter to the Director for approval, confirming that the Site has been constructed in accordance with the approved engineering designs before the disposal of waste can commence.*
- *4.6 The slope of the sides of the Site must be constructed and maintained in such a manner that the occurrence of erosion is prevented.*
- *4.7 The maximum height of the Site must not exceed the height as depicted in the engineering designs approved by the Director.*

- *4.8 Contaminated storm water works must be of such a capacity as to maintain a freeboard of half a metre and to accommodate all contaminated storm-water run-off, which could be expected as a result of the estimated maximum precipitation during a period of 24 hours with an average frequency of once in a fifty years (hereinafter referred to as the estimated maximum precipitation").”*

5.6.2 Rating:

The site plans were prepared by Jones and Wagner (Registered Professional Civil Engineers). This was done prior to the Waste Management Licence being issued so for the period under review it is not applicable. No change have been made to the plans in the period under review.

Plastic covers were placed over the active cell to prevent ingress of rain water. This gets removed as the cell is being used again.

Plate 3: Plastic lining of cells to prevent ingress of rainwater

Jones and Wagener confirmed to the Department that the construction was carried out as specified in their designs and proof of this submission was available to the auditor during the audit. The last updated slope stability report from Jones and Wagener is dated April 2019. The site was constructed in accordance with recognised engineering practice with special consideration to stability and to the approved plan.

The slopes of the sides of the site has been constructed to prevent erosion. During the audit the successful results of hydro-seeding the slopes could be seen. Please see plate 4 of the vegetated side slopes of cell 2

Plate 4: Vegetated side slopes of the cells

The slopes are inspected for erosion on a monthly basis by Ground Water Monitoring Services. A report is generated for each inspection.
The site has not exceeded the maximum height of 110mamsl as indicated in the design approved by the Director.

Contaminated storm water collection facilities meet the stated requirements and can handle the runoff of a one in fifty year storm event. Please see Plate 5 of the one of the contaminated storm water ponds that collects and stores contaminated storm water generated on site. A significant storm occurred on the 22nd of April 2019 which did cause the storm water structures to overflow. Please see **Appendix H** and the discussion under paragraph 5.4.2. The dams are currently being emptied. Contaminated storm water is trucked via road tanker to the Southern Waste Water Treatment Plant. Please see **Appendix G** for the permit to discharge the contaminated storm water.

Plate 5: Contaminated storm water collection pond. Valley 2

Rating: Full Compliance

5.7 General Management

5.7.1 Requirements: Impact Management

Section 5.1 of the Waste Management Licence (Ref No. 12/9/11/L1200/4), dated 08-04-2014:

- *"5.1.1 Waste, which is not permissible for disposal on Site, must be dealt with according to relevant legislation or the Department's policies and practices*
- *5.1.2 The Licence Holder must prevent spillages. Where they happen nonetheless, condition 2.3.1above shall apply and the Licence Holder must ensure the effective and safe cleaning of such spillages.*
- *5.1.3 The leachate must not impact on a water resource or on any other person's water use, property or land and must not be detrimental to the health and safety of the public and the environment in the vicinity of the activity.*
- *5.1.4 The Licence Holder must ensure that impact of odour from emissions from the Site is minimised*
- *5.1.5 The Licence Holder must prevent the occurrence of nuisance conditions or health hazards.*
- *5.1.6 The Licence Holder must ensure that all personnel who work with hazardous waste are trained to deal with these potential hazardous situations so as to minimise the risks involved.*
- *5.1.7 The Licence Holder must ensure that all reasonable steps, such as suitable zoning or written agreements with adjacent landowners to establish and maintain an inbuilt "buffer zone between the Site and the nearest residential and/or light industrial areas during the operative life of the Site. The "buffer zone" must be maintained as follows:*
  - *a) 180 metres to the North*
  - *b) 600 metres to the East*
  - *c) 350 metres to the East and West*
- *5.1.8 Heavy industries or industries which may create nuisance conditions may be permitted within the butter zone in terms of the appropriate legislation.*
- *5.1.9 The Licence Holder may be required to amend the buffer zone should it be proven that there are any associated detrimental effects."*

5.7.2 Rating:

Waste was received during the period under review after a trade permit was issued by the eThekwini Metro. Waste disposal re-commenced in October 2018. Please see

Table 1 for the waste volumes received. All waste arriving on site that do not comply with the requirements of this licence is sent back to the client and a non-conformance is raised against the specific client. A documented procedure is in place for the acceptance of waste: Acceptance of Waste Procedure Doc No: EWN-SHONG-LF-WI-001, Revision: 02, dated: 31/05/2016.

Small localised spills do occur from time to time but they are not of sufficient significance to warrant reporting. Where spillages did occur they were cleaned up effectively. No significant waste or chemical spillages occurred in the period under review except for the previously discussed flood and resultant storm water overflow. The response to any significant spill is contained in the emergency response procedure (EWM-SHONG-LF-WI-006, revision 14, dated 22-10-2018).

Leachate (generated by valley 1 (small volume) and valley 2) gets treated by the Leachate Treatment Plant (Waste Management Licence number **12/9/11/L467/4**). Lime is injected under hydraulic pressure to correct the pH in the waste body. This process is still conducted from time to time as and when required.
Contaminated storm water from the collection pond is sent by road tanker to the eThekwini Southern Waste water treatment works. A permit to discharge was issued on 24 January 2019 and this permit is valid from 1 February 2019 to 31 January 2020. Please see **Appendix G** for the effluent permit.

For the period under review the site received a marked reduction in complaints compared to the previous reporting period. These mostly related to odour allegedly coming from the site. The Shongweni complaints register is appended as **Appendix E.** A graph of the UHA complaints system shows a similar reduction in complaints. Please see **Appendix J**. EnviroServ is taking all reasonable steps to prevent nuisance odour including lime injection into the waste body to increase the pH and thereby reducing the formation of H_2S.

An adequate and competent staff component (52 employees including security) is employed on site. These employees are all suitably trained for the various positions at the landfill including HAZOP training. Records of training was available during the audit.

Buffer zones were established around the site as specified in licence. Due to the steep topography of the area in which the site is situated no heavy industries were

established in the buffer zones during the period under review. No request for an amendment of the buffer zone was received during the period under review.

Rating: Full Compliance

5.7.3 Requirements: Operation Management

Section 5.2 of the Waste Management Licence (Ref No. 12/9/11/L1200/4), dated 08-04-2014:

- *"5.2.1 The Licence Holder must ensure that records in terms of volume/weight and nature of all wastes received and disposed are maintained and reported as per Annexure IV hereafter on annual basis.*
- *5.2.2 Waste disposed of on Site must be compacted and covered on a daily basis with a minimum of 150 millimetres of soil, ash from Mondi or any other material approved by the Director. The ash may only be used on lined cells with class H:h specifications.*
- *5.2.3 Waste disposed on Site may only be reclaimed by EnviroServ.*
- *5.2.4 Waste disposed on Site must not be allowed to burn.*
- *5.2.5 The Licence Holder must apply sufficient dust control measures to prevent wind-blown dust from causing nuisance conditions.*
- *5.2.6 The measured concentration of flammable gas, amended for Standard Temperature and Pressure, in the atmosphere inside buildings on the Site must not exceed 1% by volume in air. Should the atmospheric levels be between 0.1% and 1%, a higher frequency of monitoring must be instituted. Should levels above 1% be detected, the Licence Holder must submit a contingency plan regarding occupational safety to the Director which must be implemented on Site.*
- *5.2.7 The Licence Holder must implement adequate measures to the satisfaction of the Director to ventilate methane gas generated in the waste disposal area; and to prevent lateral migration of methane gas in order to prevent the build-up of dangerous concentrations within the Site.*
- *5.2.8 The co-disposal ratio shall be monitored by calculating the monthly ratio of the tonnage of dry solid waste to liquid waste disposed of at the Site. The co-disposal ratio shall not be less than the target ratio determined and prescribed by a professional engineer. The professional engineer shall review the target annually based on Site stability and/or the Site's ability to manage leachate.*
- *5.2.9 The Licence holder must maintain the liquid management model that must demonstrate on a monthly basis that there is enough storage capacity for the storm water and leachate.*

- *5.2.10 The Licence Holder must submit the results of the liquid management model to the Director Bi-annually.*
- *5.2.11 A primary layer of general solid waste must be placed up to a minimum depth of 2.5 meters on the lining of the Site, before any co-disposal may commence.*
- *5.2.12 The volume of the primary layer must be kept in reserve for emergency conditions and may only be taken into account for the calculation of co-disposal rations according to condition 5.2.8, after sufficient motivation has been provided to and approved in writing by the Director.*
- *5.2.13 Co-disposal must be executed by mixing general and hazardous waste (this include only Hazard Rating 3, moderate waste; Hazard Rating 4, low hazardous waste and delisted waste) at the working face, by spreading hazardous waste on deposited waste prior to covering, or by mixing in trenches excavated in in-situ waste."*

5.7.4 Rating:

Waste volumes are reported annually as required by Annexure IV. Please see **Appendix C** for a copy of the submitted Annexure IV.

No reclamation of waste takes place or is allowed on site.

No site fires were reported on the site for the period under review.

Active dust suppression is carried out with water carts using contaminated runoff water on the lined areas of the site.

Monitoring for flammable gas was conducted by Geozone in January 2019. No contingency plan was required regarding occupational safety with regards to flammable gas in buildings. **Table 2** shows the results of the monitoring of flammable gas in buildings.

Table2: Shongweni landfill site: Building LFG sampling results (2019-01-14)

Location	CH_4 (%v/v)	CO_2 (%v/v)	O_2 (%v/v)	AP (mbar)
Laboratory	0	0.1	20.5	947
Laboratory offices	0	0.1	20.4	947
Kitchen	0	0.1	20.4	947
Reception	0	0.1	20.3	947
Men's toilets	0	0.1	20.3	947
Ladies toilets	0	0.1	20.1	947
Manager's office	0	0.1	20.2	947
Boardroom	0	0.1	20.2	947

Geozone also conducted monitoring of the sub surface gas probes in the landfill site. This is part of monitoring the generation of methane and the lateral migration of methane. The latest sampling of LFG within the SSGP was conducted on 9 April 2019.

The WML for the Shongweni landfill site does not include any specific clauses relating to the prescribed monitoring of LFG in SSGP installed on site boundaries. No guideline limits for Methane or Carbon dioxide concentrations in SSGP are listed in the WML. For the purposes of this report therefore, the collected results are compared to the following Department of Water Affairs and Forestry (DWAF) guideline limits (historically included in landfill site permits):

Methane: The DWAF guideline limit for methane in landfill gas = 1% v/v

Carbon dioxide: The DWAF guideline limit for carbon dioxide in landfill gas = 0.5% v/v

There are currently a total of twenty-six (26) SSGPs installed along the boundaries of the Shongweni landfill site. Figure 1 shows the location of the probes and **Table 3** shows the results for each probe.

Geozone evaluated the results as follows:

Methane (CH4) (explosive limits: 5% - 15%; DWAF guideline limit: 1% v/v)

- Probe No's 13B and 17B yielded results for methane in excess of the DWAF guideline limit.
- The remaining probes yielded no detectable concentrations of methane (<0.1% v/v).

Carbon dioxide (CO2) (DWAF guideline limit: 0.5% v/v)

- Probe No's 2, 13B, 17B, 20, 24 and 31 yielded results for carbon dioxide in excess of the DWAF guideline limit (0.5 % v/v).
- The remaining probes yielded low concentrations of carbon dioxide (0.1-0.4% v/v) – i.e. below the DWAF guideline limit.

Hydrogen sulphide (H2S)

- Probe No 17B again yielded a detectable concentration of hydrogen sulphide. The result yielded by this probe was however elevated (38 parts per million) compared to previous sampling periods.

Flow Rates

All of the probes yielded very low gas flow rates (0.1 litre/hour).

Both Probes No's 13B and 17B are located closed to the Valley 1 waste body and elevated methane and carbon dioxide results are therefore not unexpected. Ambient air sampling conducted by GMS at locations immediately adjacent to these probes again yielded no detectable concentrations of Methane (<0.1% v/v). The risk of fire or

explosion as a result of ambient methane concentrations at these locations therefore remains low.

The latest Methane and Carbon dioxide results, combined with the persistently low gas flow rates, suggest that the risk of significant lateral migration of LFG along/across the site boundaries remains low.

Probe No 17B yielded an elevated result for hydrogen sulphide. As a result of its location in the Valley 1 waste body, this probe regularly yields results for hydrogen sulphide in the 1-8 ppm range. The latest result (38ppm) is however markedly higher than previous results. Probe No 13B which is also located close to the Valley 1 waste body, yielded no detectable concentrations of hydrogen sulphide. Additional comment is reserved pending completion of the next sampling period.

A liquid management model is also maintained by Jones and Wagner and is updated on a monthly basis. The liquid management model results are reported on a bi-annual basis as required. Please see **Appendix D** for the proof of delivery of the Liquid management model for April 2019 by Jones and Wagner.

Condition 5.2.10 is not applicable for the period under review since this was carried out at the beginning of the construction of the site. Similarly conditions 5.2.12 and 5.2.13 is not applicable for the period under review since no emergency condition with regards to co-disposal occurred. Previously the base layer was not used to calculate co-disposal ratios. Due to the site not receiving any liquid waste, there is no current actual disposal ratio.

Rating: Full Compliance

Table 3: Summary of the SSGP parameters and results for Shongweni

	PARAMETER						
PROBE NO	CH4 %	CO2 %	O2 %	H2S (ppm)	LEL %	Flow (l/h)	AP (mb)
	Date: 2019/04/09						
1	0	0.1	20.9	0	0	0.1	948
2	0	0.9	20.1	0	0	0.1	948
3	0	0.2	20.7	0	0	0.1	948
6B	0	0.4	20.3	0	0	0.1	960
9	0	0.1	20.7	0	0	0.1	960
10	0	0.1	20.6	0	0	0.1	960
11	0	0.1	20.7	0	0	0.1	960
12	0	0.1	21.3	0	0	0.1	952
13B	41	27.3	6.6	0	100	0.1	952
15B	0	0.2	21.1	0	0	0.1	952
16	0	0.1	21.3	0	0	0.1	952
17B	20.1	11.3	11.9	38	100	0.1	952
18	0	0.1	21.3	0	0	0.1	952
19	0	0.3	20.5	0	0	0.1	948
20	0	0.6	20.2	0	0	0.1	948
21	0	0.1	20.5	0	0	0.1	948
22	0	0.1	19.8	0	0	0.1	948
23	0	0.3	20.6	0	0	0.1	948
24	0	0.5	20.8	0	0	0.1	948
25	0	0.1	21.1	0	0	0.1	959
26	0	0.2	21	0	0	0.1	959
27	0	0.2	20.9	0	0	0.1	959
28	0	0.1	20.8	0	0	0.1	959
29	0	0.2	20.6	0	0	0.1	959
30	0	0.1	21	0	0	0.1	959
31	0	0.5	20.3	0	0	0.1	959

Figure 1: Positions of the gas probes

5.8 Runoff management

5.8.1 Requirements:

Section 5.3 of the Waste Management Licence (Ref No. 12/9/11/L1200/4), dated 08-04-2014:

- *"5.3.1 All runoff water (storm water) arising as a result of precipitation on land adjacent to the site must be prevented from coming into contact with any substance, whether such substance is solid, liquid, vapour or gas, or a combination thereof, which is produced, used, stored, dumped or spilled in the premises, including leachate and must be diverted and drained from the site, by means of works constructed by the Licence Holder in accordance with condition 4.*
- *5.3.2 All runoff water (storm water) arising as a result of precipitation on the Site, must be prevented from coming into contact with any substance, as enumerated in condition 5.3.1 and must be diverted and drained from the Site and working face of the site, by means of works constructed by the Licence Holder in accordance with condition 4.*
- *5.3.3 In the event that runoff water referred to in condition 5.3.1 and 5.3.2 becomes contaminated, it must be regarded as leachate and must be dealt with according to condition 5.4.*
- *5.3.4 Runoff water arising from operational actions must be regarded as contaminated runoff and shall be managed according to condition 5.4.*
- *5.3.5 Uncontaminated runoff water must under no circumstances be used to dilute leachate emanating from the site but must be diverted to the Mgoshongweni River."*

5.8.2 Rating:

Runoff management is good on the site. Cut off trenches prevent uncontaminated water from coming into contact with waste and is diverted to the Mgoshongweni river. Contaminated runoff water is directed via drains to the contaminated storm water collection dams. Clean and contaminated runoff is effectively separated.

Rating: Full Compliance

5.9 Leachate management

5.9.1 Requirements

Section 5.4 of the Waste Management Licence (Ref No. 12/9/11/L1200/4), dated 08-04-2014:

- *5.4.1 All leachate from the Site must be contained into approved leachate containment tanks from where it must be treated or released into the municipal sewer after receiving approval from the relevant municipality"*

5.9.2 Rating:

Leachate from the cells are collected into leachate tanks constructed for this purpose. The leachate tanks have the required freeboard to cater for large storm events. Jones and Wagner is satisfied with the levels of leachate and storm water capacity. Please see the Shongweni Liquid Management Model (LMM) of April 2019 appended as **Appendix D** to this report.

Rating: Full Compliance

5.10 Monitoring

5.10.1 Requirements: Monitoring methods and parameters

Section 6.1 of the Waste Management Licence (Ref No. 12/9/11/L1200/4), dated 08-04-2014:

- *"6.1.1 The Licence Holder must carry out all tests required in terms of this Licence in accordance with published laboratory analysis methods or those prescribed by and obtainable from the South African Bureau of Standards (SABS) and SANAS approved, referred to in the Standards Act, 2008 (Act 08 of 2008).*
- *6.1.2 The Licence Holder may use another method of analysis if approved by the Director."*

5.10.2 Rating:

The laboratory at Shongweni is operated according to ISO17025, other tests are conducted at EnviroServ's Rietfontein Laboratory which is SANAS accredited (certificate T0529 –valid until 12 February 2022). Specialists conducting studies on behalf of EnviroServ also ensures that any testing conducted is done at accredited laboratories. EnviroServ does not make use of any other methods that need approval from the Director.

Rating: Full Compliance

5.10.3 Requirements: Water quality monitoring

Section 6.2 of the Waste Management Licence (Ref No. 12/9/11/L1200/4), dated 08-04-2014:

- "*6.2.1 Monitoring of ground and surface water quality must be conducted according to the Water Monitoring Protocol in Jones and Wagener Report JW 136/10/B196 Rev 00 or its successor as approved by the Director.*
- *6.2.2 Monitoring Borehole where the ground water in the borehole is at an expected higher hydraulic pressure level than the hydraulic pressure level of the ground water under the Site, shall be considered as background monitoring for ground water quality and must be conducted for each monitoring occasion specified in conditions 6.4, 6.5 and 6.6.*
- *6.2.3 The established groundwater monitoring network for the site shall be maintained by the Licence holder to the satisfaction of the Director, so that unobstructed sampling, as required in terms of this Licence can be undertaken.*
- *6.2.4 Monitoring boreholes must be equipped with lockable caps. The Department and the DWA reserves the right to take water samples at any time and to analyse these samples, or to have them analysed."*

5.10.4 Rating:

These requirements were complied with. Water monitoring was conducted by Jones and Wagner according to the Water Monitoring Protocol from Jones and Wagner numbered JW136/10/B196 Rev00. This protocol has been updated and the updated protocol submitted to the DEA on 18 March 2019. The findings of the reports are discussed under paragraph 5.13.2. The Groundwater monitoring network is maintained so that unobstructed access to the boreholes is possible for sampling. Boreholes are equipped with a lockable cap as required. The second part of condition 6.2.4 is a departmental function and not a compliance condition for EnviroServ.

Rating: Full Compliance

5.11 Surface water monitoring network

5.11.1 Requirements

Section 6.3 of the Waste Management Licence (Ref No. 12/9/11/L1200/4), dated 08-04-2014:

- *"6.3.1 Surface water monitoring shall be performed in the storm water drain adjacent to the Site and at locations selected in conjunctions with the Department*

of Water Affairs and at such a frequency as may be determined by the responsible authority.

- *6.3.2 Surface water monitoring must be conducted as specified in Report No. JW136/10/B196 Rev 00 or its successor as approved by the Director.*
- *6.3.3 Bio-monitoring of the Mgoshongweni stream below the Site, upstream of the road crossing and located before the confluence with the tributary must be conducted bi-annually."*

5.11.2 Rating:

Conditions 6.3.1, 6.3.2 and 6.3.3 have been complied with in terms of the monitoring being carried out. Water monitoring was conducted by Jones and Wagner according to the Water Monitoring Protocol from Jones and Wagner JW136/10/B196 Rev 00. This protocol has been updated and the updated protocol submitted to the DEA on 18 March 2019.

Biomonitoring of the Mgoshongweni stream was conducted by GroundTruth in May 2019 this report is still in draft.

GroundTruth came to the following conclusion:

The large rainfall and flood events in mid-April (more than 130mm in 2 days) have had a major impact at all three sampling sites, where scouring and flushing of sand has drastically altered the habitat composition. Typically, macroinvertebrates and diatoms take four to six weeks to recolonise an area following major disturbances and still longer for the communities to stabilize along the successional gradient, to present a true representation of water quality. The routine sampling at Shongweni Landfill took place four weeks after the flood event and it was evident that recolonization of the site by macroinvertebrates and diatoms was still in progress.

- The upstream site was in a fair condition despite the disturbance from flooding. While the SASS results showed seriously modified conditions, this related to physical disturbance and not water quality.
- Similarly, the changes at both the central and lower sites are mostly related to physical disturbance and while habitats were severely limited at both sites the SASS health scores improved marginally at both sites.
- The physico-chemical results show a minor increase in electrical conductivity in a downstream progression. However, concentrations were half of those measured in November 2018.
- Sedimentation and run-off emanating from the area under the control of EnviroServ requires continued management and attention.
- Measures have been put in place to mitigate the sedimentation concerns and these are being managed. However, regular clearing of the sediment trap,

maintenance of berms, drains and roads, as well as, control of alien invasive plants within the riparian areas needs to be continued and improved upon.

Rating: Full Compliance

5.12 Background monitoring

5.12.1 Requirements

Section 6.4 of the Waste Management Licence (Ref No. 12/9/11/L1200/4), dated 08-04-2014:

- *"6.4.1 Boreholes located sufficiently up-gradient of the site with rest water levels (masl) at a higher elevation than those on the site shall be considered as background monitoring boreholes.*
- *6.4.2 Background groundwater monitoring must be conducted annually in terms of conditions6.4 and/or 6.5 for water quality variables listed in Annexure II."*

5.12.2 Rating:

These requirements are complied with. Boreholes above the groundwater gradient is being used as background values. Groundwater monitoring is conducted by Jones and Wagner. The results of this report is discussed under paragraph 5.13.2. The borehole network and their respective depths are shown in **Table 7**

Rating: Full Compliance

5.13 Detection Monitoring

5.13.1 Requirements

Section 6.5 of the Waste Management Licence (Ref No. 12/9/11/L1200/4), dated 08-04-2014:

- *"6.5.1 Monitoring for surface water and groundwater quality must be conducted quarterly for the variables listed in Annexure III at locations specified in conditions 6.2.2 and 6.2.3.*
- *6.5.2 Monitoring of leachate and contaminated runoff water must be conducted quarterly for the water quality variables listed in Annexure II and annually for water quality variables listed in Annexure III.*
- *6.5.3* ***No such number in the licence***
- *6.5.4 Leak and Failure Detection Monitoring*

  6.5.4.1 The leachate detection system must be monitored quarterly for the occurrence of leakages, and a higher frequency of monitoring, as

approved by the Director, must be initiated should a leak be suspected and/or identified.

6.5.4.2 All pipes exposed to the leachate shall be subjected to annual pressure testing for leaks where practical. A record must be made available on request by the Director.

6.5.4.3 Inspections of liners where liners are accessible must be conducted monthly.

6.5.4.4 Should a leak or failure be suspected or detected during monitoring, inspections or tests conducted in accordance with conditions or at any other time, it must be regarded as an incident according to condition 9.1 and addressed according to condition 6.5.4.5.

6.5.4.5 Liners must be repaired when possible, or replaced when necessary under the supervision of the Professional Registered Engineer."

5.13.2 Rating:

Water quality monitoring is conducted by Jones and Wagner as required by this licence, the last available monitoring report is dated July 2018. The report is numbered The report is 283 pages and cannot be appended to this report. The report is available on site. The reports form Jones and Wagner are also submitted to the DEA as required.

Jones and Wagner came to the following conclusion in the report:
The capping of Valley 1 has been completed and due to the steep slopes, there has been a significant improvement on the leachate and leachate detection volumes that are generated, as well as on the water quality within the sub-soil seepage, surface water and groundwater on the downstream side of the valley.

Surface water

As a result of the capping, the Valley 1 storm water dam no longer has a catchment other than the rain that falls on it, but it is used as a backup system for the Valley 2 overflow.

All storm water runoff from Valley 1 is diverted to the north and south storm water canals which flow around the dam and discharge in the valley below the dam and through the train culvert.

The Valley 1 Storm water Dam (13) was found to have an elevated electrical conductivity value, although this is due to the fact that Valley 2 storm water and

leachate was pumped up to the Valley 2 header tanks and from there they had flowed into Valley 1. From Valley 1 they are pumped up the rising main to the top tanks. A system has been implemented which pumps the leachate and storm water separately up to the top tanks so as to split leachate and storm water, the latest sampling would indicate that the system is having the desired effect as a significant decrease has been observed.

The Valley 2 Storm water Dam (11) has had a significant reduction in electrical conductivity as a result of overflows which has ceased.

Sampling position 29 is water sampled in the silt trap which originates from a combination of contaminated storm water that is running down the road due to the change in access strategy into the cell, as well as sub-soil seepage from beneath the Storm water Dam Wall. A local contractor has been appointed to divert this water into the contaminated storm water dam, and as a result, the sampling position has been mostly dry. In January 2018, however, a sample could be retrieved, and the electrical conductivity was found to be low.

In July 2018, a slight decrease was noted across Valley 2 as well as downstream of both Valleys, indicating no impact from site.

In terms of tritium data: in January 2018, an impact from Valley 1 was evident, although this has since dissipated when sampled in May 2018. The latest tritium therefore confirms that the site, currently, is having no impact on the surface water further downstream.

The following conclusions are noted from the aquatic assessment:

- The tributary of the Mgoshongweni River upstream of Shongweni Landfill site is in a good condition upstream and downstream of the currently active cell.
- The physico-chemical results show a minor increase in electrical conductivity in a downstream progression.
- More detailed water chemistry samples should be collected during the next sampling event from the downstream site to identify the cause of the generally lower health score found at the site.
- The tributary is still receiving sediments as a result of continual erosion and run-off from the landfill site.
- Sedimentation and run-off emanating from the area under the control of EnviroServ requires continued management and attention. This is owing to the negative impacts observed on the receiving river environment.
- Measures have been put in place to mitigate the sedimentation concerns, these are being managed. However, regular clearing of the sediment trap, maintenance of berms, drains and roads and control of alien invasive plats within the riparian areas needs to be continued and improved upon.

The positions of the of the surface water sampling points are shown in **Table 4**

Table 4: Existing surface water sampling positions at the Shongweni Waste Disposal Facility

Surface water position	Comment
13. Valley 1 Contaminated Storm water Dam	Sampled at number 13
11.Valley 2 Contaminated Storm water Dam	Sampled at number 11
29 Valley 2 Storm water	Storm water entering the catchment (plus overflow from 24). Sampled in the silt trap.
SW2	At gabion baskets above railway line within Valley 1.
SW3	Downstream of Valley 2 (Upstream of Valley 1)
SW4	Downstream of the site above the confluence with the Mgoshongweni
SW5	Downstream of site above the confluence with the Mgoshongweni (at borehole BH05-10S/D)
SW6	Upstream of Valley 2

Leachate

Generally, there is no leachate draining out of Cell 0, which was again the case in July 2018.

The leachate position 18 (Leachate Draining Valley 1) was found to be dry since July 2016. The reason for this is likely to be due to the fact that the Valley has been capped and leachate generation reduced. The electrical conductivity value of the leachate in the Valley 1 Leachate Tank is high as a result of elevated concentrations of ammonia, chloride, sulphate, boron, fluoride and sodium. In terms of trace elements, the total manganese concentration has elevated for July 2018. It is noted that there has been a recent significant increase in the electrical conductivity value of the leachate within the Valley 1 tank. The reason for this is due to the fact that Valley 1 receives storm water and leachate from Valley 2.

The leachate draining out of Valley 2 has a very high electrical conductivity as a result of elevated concentrations of chloride, sulphate, boron, fluoride and sodium and potassium. In July, iron and manganese were elevated. The reason for the significantly higher electrical conductivity value of the leachate in Valley 2 as compared to Valley 1 is likely to be due to a difference in the chemistry of the waste that has been accepted / disposed.

It is further noted that the temporary capping of Valley 2, could cause a reduction in dilutionary effects and cause an increase in electrical conductivity.

Leachate / Leakage Detection

There are eight leachate detection points and three leakage detection sampling points within Valley 1. Two of the leachate detection points were found to be dry over the monitoring period. The remaining sampling positions were found to all have elevated electrical conductivity values, although the flows have decreased as a result of the capping of Valley 1.

In terms of the leakage detection point, sampling positions 14 and 16 where dry in July 2018 while sampling position 15 had an elevated electrical conductivity.

The leachate detection sampling positions in Valley 2, when, present was elevated. The leakage position has decreased over the previous two years.

The leachate /leakage detection monitoring positions are indicated in **Table 5**

Table 5: Existing leachate / leakage detection monitoring positions at the Shongweni Waste Disposal Facility

Leachate detection position	Comment
Valley 1	
2 LD4S	Valley 1: Leachate detection of Cell 4 south flank slopes, sampled at pipe number 2
3 LD3	Valley 1: Leachate detection Cell 1, 2 and 3, sampled at pipe number 3
4 LD4N	Valley 1: Leachate detection Cell 4 north flank slopes, sampled at pipe number 4
5 LD3P	Valley 1: Leachate detection extension to Cell 3 pipes, sampled at pipe number 5
6 SLSD3	Valley 1: Sub-liner sand drain Cell 3, sampled at pipe number 6
7 SLSD4	Valley 1: Sub-liner sand drain Cell 4, sampled at pipe number 7
8 LD4B	Valley 1: Leachate detection Cell 4 basin sampled at pipe number 8
12 Drainage blanket	Valley 1: Sampled at pipe number 12.
14	Valley 1: Leakage Detection Stormwater Dam
15	Valley 1: Leakage Detection Stormwater Dam
16	Valley 1: Leakage Detection Embankment Drainage from Stormwater Dam
Valley 2	
19	Valley 2: Leachate Detection North Bench
22	Valley 2: Leachate Detection Main Cell
23	Valley 2: Leachate Detection South Bench
26	Valley 2: Leakage Detection Stormwater Dam

Sub-soil Seepage

The sub-soil seepage from Cells 1, 2 and 3 within Valley 1, as well as sub-soil seepage from the Valley 1 Storm water Dam is captured in a new sump on the downstream side of the Valley 1 Storm water Dam. In July 2018, this water was characterised by an elevated electrical conductivity value as a result of elevated concentrations of ammonia, chloride, fluoride and sodium. The elevated concentrations of iron and manganese is a result of solid particles found within the water samples.

Sampling positions 24 (beneath the Main Cell), 25 (beneath Storm water Dam) and 27 (beneath Storm water Dam Wall) sample subsoil seepage within Valley 2. Sampling position 24 is currently uncontaminated and is discharged to the environment. Sampling position 25 has an electrical conductivity value of 232 mS/m, the trend of the electrical conductivity value has, however, been decreasing over the last three sampling exercises, the water is currently being pumped back into the dam.

Sampling position 27 had an electrical conductivity that has decreased from 172mS/m in July 2017 to 114 mS/m in July 2018.

The subsoil seepage sampling pints are shown in **Table 6**

Table 6: Existing sub-soil seepage sampling positions at the Shongweni Waste Disposal Facility

Sub-soil seepage position	Comment
Valley 1	
9 GW123	Valley 1: Drain on the downstream side of the Cell 1, 2 and 3 stability buttress, sampled at pipe number 9 or at culvert.
17	Valley 1: Downstream Sump
Valley 2	
24	Valley 2: Sub-soil seepage Main Cell
25	Valley 2: Sub-soil seepage Stormwater Dam
27	Valley 2: Sub-soil seepage Stormwater Dam Wall

Groundwater

The predicted flow directions indicate that boreholes BH4C, BH6, BH9, BH09-07S and BH09-07D would not be impacted on by the waste within either Valley 1 or Valley 2. This is true for boreholes BH4C, BH6 and BH9 and as such, these boreholes were not sampled in the July 2018 sampling exercise.

The electrical conductivity within boreholes BH09-07S and BH09-07D have continued to decrease over the last three (3) years. The total iron was elevated in both boreholes whilst manganese was elevated in BH09-07S. Neither constituents had elevated dissolved concentrations.

The borehole pair BH05-12S / BH05-12D was drilled between the storm water dam and the waste body within Valley 1. In July 2018 sampling position BH05-12S was found to be dry. For the fractured aquifer BH05-12D, the only inorganic constituent found to exceed the screening guideline was fluoride, which is believed to have originated from the natural granitic geology. In terms of trace elements, the total iron was found to be elevated.

Three boreholes (BH09-13S, BH09-13M and BH09-13D) are located at the base of Valley 2. The water quality of these boreholes is good with the only constituent found to

be elevated being fluoride and in terms of trace elements, the total iron and manganese was elevated even though none of these were dissolved in the sample.

Pressure testing of leachate the pipes that can be tested have been carried out in the period under review. Proof of these inspections were available for the auditor to review. The report included calibration certificates of the pressure gauges.

Liners are inspected on a monthly basis by the supervisor on site and no reportable issues were noted in the period under review. No leak or failure were suspected or detected during the period under review. Repairs of liner will be done as it becomes necessary but this was not required in the period under review.
The borehole network and their respective depths are shown in **Table 7**

Table 7: Groundwater monitoring boreholes at the Shongweni Waste Disposal Facility

Borehole Number	Depth
BH4C	61.45m
BH6	90m
BH09-07S	36m
BH09-07D	80m
BH9	138m
BH05-12S	4.0m
BH05-12D	25m
BH09-13S	4.0m (3.0m screen)
BH09-13M	16m (6.0m screen)
BH09-13D	30m (6.0m screen)

Rating: Full Compliance

5.14 Investigative monitoring

5.14.1 Requirements

Section 6.6 of the Waste Management Licence (Ref No. 12/9/11/L1200/4), dated 08-04-2014:

- *"6.6.1 If, in the opinion of the Director: RPW, a water quality variable at any monitoring point listed under the detection monitoring programme, as referred to in condition 6.5.1, shows a significant increasing trend, the licence holder shall initiate a monthly monitoring programme for the water quality variables listed in Annexure II"*

5.14.2 Rating:

For the period under review, no such directive were received from the director and is therefore currently not applicable.

Rating: Not Applicable

5.15 Investigations

5.15.1 Requirements:

Section 7 of the Waste Management Licence (Ref No. 12/9/11/L1200/4), dated 08-04-2014:

- *"7.1 If, in the opinion of the Director, environmental pollution, nuisances or health risks may be occurring or is occurring on the Site, the Licence Holder must initiate an investigation into the cause of the problem or suspected problem.*
- *7.2 If, in the opinion of the Director and/or Director: RPW, water pollution may be occurring or is occurring the Licence Holder must initiate an investigation into the cause of the problem or suspected problem. Such investigation must include the monitoring of the water quality variables, at those monitoring points and at such frequency as maybe specified by Director: RPW.*
- *7.3 Should the investigation carried out as per conditions 7.1 and 7.2 above reveal any unacceptable levels of pollution, the Licence Holder must submit mitigation measures to the satisfaction of the Director."*

5.15.2 Rating:

Apart from the flooding event in April 2019 discussed under paragraph 5.4.2, no water related incident occurred on site during the period under review.

Rating: Not Applicable

5.16 Records

5.16.1 Requirements

Section 8 of the Waste Management Licence (Ref No. 12/9/11/L1200/4), dated 08-04-2014:

- *"8.1 The Licence Holder must keep records and update all the information referred to in Annexure IV and submit this information to the Director on an annual basis.*
- *8.2 All records required or resulting from activities required by this licence must:*

a) Be legible;

b) Be made as soon as reasonably practicable and should form part of the extremal audit report;

c) If amended, be amended in such a way that the original and any subsequent amendments remain legible and are easily retrievable; and

d) Be retained in accordance with documented procedures.

- *8.3 The Permit Holder must keep records of the following for all hazardous waste (this include only Hazard Rating 3, moderate waste; Hazard 4, low hazardous waste and delisted waste) deposited on the Site and must update all the information referred to in Annexure III* ***(should read Annexure IV)*** *on an annual basis.*
- *8.4 Records of training and verification of competence must be kept by the Licence Holder.*
- *8.5 Records demonstrating compliance with condition 2.1.1 must be kept and maintained for a period of five (5) years."*

5.16.2 Rating:

Records are kept as part of element 7.5 (Documented information) of the EnviroServ EMS. There is a very good record keeping procedure (SHEQ-NAT-COP-005, revision 7, dated 30-04-2018) that addresses the receipt storage and dispossession of records. This procedure also states a five year retention period. The procedure also spells out responsibilities for keeping records and record retention times. Records of the waste deposited on the site is kept as part of the operation of the site. Waste volumes are reported annually as required by Annexure IV. Please see **Appendix C** for a copy of the submitted Annexure IV. Training records are available at the site for all personnel working at the site.

Rating: Full Compliance

5.17 Reporting

5.17.1 Requirements

Section 9 of the Waste Management Licence (Ref No. 12/9/11/L1200/4), dated 08-04-2014:

- *"9.1 The Licence Holder must, within 24 hours notify the Director of the occurrence or detection of any incident on the Site, or incidental to the operation of the site, which has the potential to cause, or has caused pollution of the environment, health risks, nuisance conditions or water pollution.*

- *9.2 The Licence Holder must, within 14 days, or a shorter period of time, if specified by the Director from the occurrence or detection of any incident referred to in condition 9.1, submit an action plan, which must include a detailed time schedule, and resource allocation signed off by top management, to the satisfaction of the Director and/or the Director: RPW of measures taken to-*
  - *a) correct the impact resulting from the incident;*
  - *b) prevent the incident from causing any further impact; and*
  - *c) prevent a recurrence of a similar incident.*
- *9.3 In the event that measures have not been implemented within 21 days of the incident to address impacts caused by the incident referred to in condition 9.1, of measures which have been implemented are inadequate, the Director may implement the necessary measures at the cost and risk of the Licence Holder.*
- *9.4 The Licence Holder must keep an incident and complaints register, which must be attached to the external audit report, as well as made available to the Department and DWA for audit purposes.*
- *9.5 The Department must be notified without delay in the case of the following:*
  - *a) Any malfunction, breakdown or failure of equipment or techniques; accident or fugitive emission which has caused, is causing or may cause significant pollution;*
  - *b) The breach of this Licence; and*
  - *c) Any significant adverse environmental and health effects.*
- *9.6 The Department must be notified within 14 days of the following changes:*
  - *a) Licence Holder's trading name, registered name or registered office address;*
  - *b) Particulars of the licence Holder's ultimate holding company (including details of an ultimate holding where a licence holder has become a subsidiary;*
  - *c) Steps taken with a view to the Licence Holder, or anyone of them, going into bankruptcy, entering into composition or arrangement with creditors, or, in the case of them being in a partnership, dissolving the partnership.*
- *9.7 The water quality monitoring reports must be submitted annually to the Director. All monitoring results must be presented graphically as per minimum requirements for monitoring second edition 1998.*
- *9.8 Each external audit report referred to in condition 10.2 below must be submitted to the Director within 30 days from the date on which the external auditor finalised the audit report."*

5.17.2 Rating:

The previously mentioned flood was reported as required. No response other than acknowledgment of receipt were received from the authorities.

Please see a copy of the complaints register appended as **Appendix E** as well as an Incident register appended as **Appendix F.**

EnviroServ has received a greatly reduced number of complaints for the period under review August 2018 to June 2018. The complaints reported on, are those recorded on the formal Shongweni complaints system as required by this Waste Management Licence. A graph of the UHA website complaints show a similar decreasing trend.

No changes occurred to the licence holder or its holding company in the period under review that warranted reporting to the Department.

Water monitoring reports are submitted to the Director as required. Monitoring data is shown graphically as required and no correspondence have been received regarding the contents of the monitoring reports.

The 2018 external audit report was submitted to the Department as required.

Rating: Full Compliance

5.18 Auditing

5.18.1 Requirements: Internal audits

Section 10.1 of the Waste Management Licence (Ref No. 12/9/11/L1200/4), dated 08-04-2014:

- *"10.1.1 Internal audits must be conducted biannually by the Licence Holder and on each audit occasion an official report must be compiled by the relevant auditor to report the findings of the audits, which must be made available to the external auditor specified in condition 10.2.1."*

5.18.2 Rating:

The Licence holder has conducted the bi-annual internal audits as required. Copies of these audit reports were made available to the external auditor for review and verification.

Rating: Full Compliance

5.18.3 Requirements: External audits

Section 10.2 of the Waste Management Licence (Ref No. 12/9/11/L1200/4), dated 08-04-2014:

- *"10.2.1 The Licence Holder must appoint an independent external auditor to audit the site annually and the auditor must compile an audit report documenting the findings of the audit, which must be submitted by the licence holder according to condition 9.8 above.*
- *10.2.2 The audit report must:*
  - *a) Specifically state whether conditions of this licence are adhered to;*
  - *b) Include an interpretation of all available data and test results regarding the operation of the site and all its impacts on the environment;*
  - *c) Specify target dates for the implementation of the recommendations by the Licence Holder to achieve compliance;*
  - *d) Contain recommendations regarding non-compliance or potential non-compliance and must specify target dates or the implementation of the recommendations by the Licence Holder and whether corrective action taken for the previous audit non-conformities was adequate; and*
  - *e) Show monitoring results graphically and conduct trend analysis."*

5.18.4 Rating:

The previous audit was conducted in 2018 by Dorean Environmental Services. The report was sent to the DEA as required in condition 9.8.

One partial compliance was raised that related to conditions 5.1.4 and 5.1.5 due to the odour complaints directed at the Site.

Recommendations were made regarding the partial compliance to the conditions of the licence. Due to the drastic decrease in complaints for this period under review, the auditor is of the opinion that the site is complying with conditions 5.1.4 and 5.1.5.

Rating: Full Compliance

5.18.5 Requirements: Departmental audits and inspections

Section 10.3 of the Waste Management Licence (Ref No. 12/9/11/L1200/4), dated 08-04-2014:

- *"10.3.1 The Department reserves the right to audit and/or inspect the Site without prior notification at any time and frequency as may be determined by the Director.*
- *10.3.2 The Licence Holder must make any records or documentation available to the Director upon request as well as any other information he/she may require."*

5.18.6 Rating:

Section 10.3.1 relates to Department actions and is therefore not applicable for the purposes to this report. Records has been made available as and when required during the period under review.

Rating: Not applicable

5.19 Monitoring committee

5.19.1 Requirements

Section 11 of the Waste Management Licence (Ref No. 12/9/11/L1200/4), dated 08-04-2014:

- *"11.1 The Licence Holder must maintain and ensure continued functioning of a Monitoring Committee for the normal operative lifetime of the Site and for a period of at least two years after the closure of the Site, or such longer period as may be determined by the Director.*
- *11.2 The Monitoring Committee must formulate terms of reference and code of conduct, according to the Minimum Requirements, Second Edition 1998 by the Department of Water Affairs and Forestry or its successor.*
- *11.3 The Monitoring Committee must be comprised of relevant interested and affected persons.*
- *11.4 The Monitoring Committee must meet at least once every six months. The latest external audit report must be presented in the meetings.*
- *11.5 The Licence Holder must keep minutes of the Monitoring Committee and distribute these minutes to all members of the Monitoring Committee within 14 days after the meeting."*

5.19.2 Rating:

A very active Monitoring Committee is maintained. The committee established a code of conduct and terms of reference as required. Meeting minutes are distributed accordingly as required.

Rating: Full Compliance

5.20 Leasing and alienation of the site

5.20.1 Requirements

Section 12 of the Waste Management Licence (Ref No. 12/9/11/L1200/4), dated 08-04-2014:

- *"12.1 Should the Licence Holder want to alienate or lease the site, he/she must notify the Director in writing of such an intention at least 120 days prior to the said transaction*
- *12.2 Should the approval be granted, the subsequent Licence Holder shall remain liable for compliance with all licence conditions."*

5.20.2 Rating:

Currently there are no plans to alienate or lease the site and therefore the condition do not apply for the period under review so for the purpose of this report is not auditable.

Rating: Not Applicable

5.21 Transfer of the Waste Management Licence

5.21.1 Requirements

Section 13 of the Waste Management Licence (Ref No. 12/9/11/L1200/4), dated 08-04-2014:

- *"13.1 Should the Licence Holder want to transfer the Licence, he/she must apply in terms of Section 52 of the National Environmental Management: Waste Act, 2008 (Act No 59 of 2008).*
- *13.2 Any subsequent Licence Holder shall be bound by conditions of the licence."*

5.21.2 Rating:

Currently there are no plans to transfer the licence and therefore the condition do not apply for the period under review so for the purpose of this report is not auditable.

Rating: Not Applicable

5.22 General

5.22.1 Requirements

Section 14 of the Waste Management Licence (Ref No. 12/9/11/L1200/4), dated 08-04-2014:

- *"14.1 This Licence shall not be transferable unless such transfer is subject to condition 13.1.*
- *14.2 This Licence shall not be construed as exempting the Licence Holder from compliance with the provisions of the National and Provincial Legislation and any relevant Ordinance, Regulation, By-laws or relevant National Standards and norms.*
- *14.3 Transgression of any condition of this Licence could result in the validity of the Licence being terminated by the Department.*
- *14.4 Non-compliance with a condition of this Licence may result in criminal prosecution or other actions provided for in Section 67(1) of the National Environmental Management: Waste Act, 2008.*
- *14.5 Any committees appointed in terms of the application or any other public authority or organisation shall not be held responsible for any damages or losses suffered by the Licence Holder or his/her successor in title in any instance where construction or operation are to be temporarily or permanently stopped for reasons of non-compliance.*
- *14.6 In terms of section 28 and 30 of the National Environmental Management Act No.107 of 1998, and section 19 and 20 of the National Water Act No. 36 of 1998, any costs incurred to remedy environmental damage must be borne by the person responsible for the damage. It is therefore imperative that the Licence Holder reads through and understand the legislative requirements pertaining to the project. It is the Applicant's responsibility to take reasonable measures which include informing and educating contractors and employees about environmental risks of their work and training them to operate in an environmental acceptable manner.*
- *14.7 This Licence is valid for a period of ten (10) years and shall be reviewed every five (5) years from the date of issue or at any time before or after that date. Based on the results of the review, especially compliance to Licence conditions or recommendations from the audit reports and or changing legislation, the Licence could be amended or withdrawn or validity thereof extended."*

5.22.2 Rating:

Section 14 is a number of statements and not conditions to which EnviroServ can comply and is therefore not auditable.

Rating: Not applicable

6. AUDIT CONCLUSIONS AND RECOMMENDATIONS

RECOMMENDATIONS

1) On-going active management of the Valley 1 and Valley 2 sumps.
2) The May 2018 GroundTruth report has indicated a more detailed water chemistry sample is collected during the next sampling event from the downstream site to identify the cause of the generally lower health score found at the site. As a start the data included in this report will be sent to GroundTruth.
3) GroundTruth also recommended regular maintenance of the sediment trap (as above), maintenance of berms, drains and roads and control of alien invasive plants within the riparian areas needs to be continued and improved upon.
4) On-going monitoring on a quarterly basis.
5) The current SSGP network is adequate and does not require any further expansion, modification or repair at this stage. There is no immediate need to repair or replace any probes on site.
6) Particular attention will be paid to the hydrogen sulphide results yielded by Probe 17B. If this probe continues to yield particularly elevated results for hydrogen sulphide (>10 ppm), additional investigation may be required.
7) Should elevated Methane and/or Carbon dioxide concentrations be consistently recorded in any of the SSGP on the boundaries of the site, additional remedial actions may be recommended.
8) Repeat sampling of LFG in SSGP on the site boundaries should continue to be performed every 3 months.

CONCLUSION

The audit shows that the landfill is in compliance with its Waste Management Licence Conditions. In addition, the site is continually showing improvement in its design, construction and operation, in line with its licence requirements and the SHEQ policy of the company. A summary of the audit findings can be seen in **Table 8** below:

Table 8: Summary of Audit Findings

PARAGRAPH IN REPORT	SPECIFIC CONDITIONS AUDITED	RATINGS		
		Full Compliance	*Partial Compliance*	*Non Compliance*
5.1.2	1.3.1	X		
5.1.4	1.3.2	X		
5.2.2	2.1.1	X		
5.2.4	2.1.2	X		
5.2.6	2.1.3	NA		
5.3.2	2.2.	X		
5.4.2	2.3.1	X		
5.5.2	3.1 & 3.2	X		
5.6.2	4	X		
5.7.2	5.1	X		
5.7.4	5.2	X		
5.8.2	5.3	X		
5.9.4	5.4	X		
5.10.2	6.1	X		
5.10.4	6.2	X		
5.11.2	6.3			
5.12.2	6.4	X		
5.13.2	6.5	X		
5.14.2	6.6	NA		
5.15.2	7	NA		
5.16.2	8	X		
5.17.2	9	X		
5.18.2	10.1	X		
5.18.4	10.2	X		
5.18.6	10.3	NA		
5.19.2	11	X		
5.20.2	12	NA		
5.21.2	13	NA		
5.22.2	14	NA		

7. APPENDICES

APPENDIX A: ISO14001:2004 Certificate

bsi.

By Royal Charter

Certificate of Registration

ENVIRONMENTAL MANAGEMENT SYSTEM - ISO 14001:2015

This is to certify that:

Enviroserv Waste Management (Pty) Ltd.
Brickfield Road, Meadowdale,
Meadowdale,
Gauteng, South Africa.
1401
South Africa

Holds Certificate No: **EMS 631298**

and operates an Environmental Management System which complies with the requirements of ISO 14001:2015 for the following scope:

The receipt, storage, treatment and disposal of general and hazardous wastes in terms of Category A and B listed activities at landfill sites and treatment facilities in line with the individual licences and permits for the Shongweni, Holfontein, Chloorkop, Aloes landfill and the Roodepoort healthcare risk waste incinerator. The scope excludes the transportation of waste outside of these sites.

For and on behalf of BSI:

Andrew Launn, EMEA Systems Certification Director

Original Registration Date: 2004-07-09
Latest Revision Date: 2018-08-31

Effective Date: 2018-08-31
Expiry Date: 2021-08-30

Page: 1 of 3

...making excellence a habit.™

UKAS MANAGEMENT SYSTEMS 003

This certificate was issued electronically and remains the property of BSI and is bound by the conditions of contract.
An electronic certificate can be authenticated online.
Printed copies can be validated at www.bsigroup.com/ClientDirectory

Information and Contact: BSI, Kitemark Court, Davy Avenue, Knowlhill, Milton Keynes MK5 8PP. Tel: + 44 345 080 9000

BSI Assurance UK Limited, registered in England under number 7805321 at 389 Chiswick High Road, London W4 4AL, UK.

APPENDIX B: Appointment of the Waste Management Control Officer

ENVIROSERV WASTE MANAGEMENT	Title	Document No.	Revision No.
	NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT (2008) SECTION 49(1)(a) – WMCO APPOINTMENT	EWM-COMPL-AF-AAA	00

BONGANI ZONDO

I, (*Nico Vermeulen*), the (*16.2*) appointee and Operations Director of (*TDS*), hereby appoint you, (*BONGANI ZONDO*), as the Waste Management Control Officer (WMCO) for (*Shongweni Landfill*) as per NEMWA Sec 49 (1)(a).

Your duties as WMCO are to:

a) *Take all reasonable steps to ensure compliance by the holder of the waste management licence conditions and requirements and the provisions of the Act and*

b) *Promptly report any non-compliance with any licence conditions or requirements or provisions of this Act to the licensing authority through the most effective means reasonably available.*

Yours faithfully,

For and on behalf of EnviroServ Waste Management (PTY) Ltd

NICO VERMEULEN
OPERATIONS DIRECTOR

10 / 07 / 2018
Date

Kindly confirm your acceptance of this appointment by completing the following:

ACCEPTANCE

I, BONGANI R. ZONDO understand the implications of the appointment as detailed above and confirm my acceptance thereof.

Signature (Bongani Zondo)

11 / 07 / 2018
Date

Page 1 of 1

APPENDIX C: Annexure IV waste volumes report

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

H:h Licence- Shongweni Waste Disposal Site Waste Management Licence

ANNEXURE IV
INFORMATION WHICH SHALL BE SUBMITTED ON AN ANNUAL BASIS: CONDITIONS 5.2.1 AND 8.1

* = *Indicate with an X. Please print legibly.*

NAME OF SITE: ENVIROSERV WASTE MANAGEMENT SHONGWENI LANDFILL DATE OF REPORT: 2019-02-20 (yy/mm/dd) FOR PERIOD 2018

1. **Registered owner(s) of property on which waste management facility are situated:**

Name	ENVIROSERV WASTE MANAGEMENT	Telephone	011 456 5400
Postal Address	P.O. BOX 1547	Fax	011 454 6106
	BEDFORDVIEW	Postal Code	2008

2. **Operator in control of waste management facility:**

Name	R. B ZONDO	Telephone	011 456 5425
Identity number	8610065727081	After hours	071 607 1615
Educational Qualifications (*)	BTECH: CHEMISTRY		
	DEPOT MANAGER.		

3. **Latest estimated lifetime of the waste management facility:** 8 yr.

4. **Indicate the approximate quantities of waste deposited on site during the year:**

Type of waste	Quantity (m^3 annum^{-1})	Compacted (C)	Uncompacted (U)
Non-hazardous waste			
Household			
Garden refuse			
Building rubble			
Industrial (not hazardous)-specify			
TOTAL	525		
Hazardous waste			
Flammable solids			
Flammable liquids			
Oxidising agents			
Toxic wastes			
Corrosive wastes			
Hospital and infectious wastes (specify)			
TOTAL	1211.94		

Batho pele- putting people first

Page 22 of 25
12/9/11/L1200/4

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

H:h Licence- Shongweni Waste Disposal Site Waste Management Licence

5. (a) Indicate the method of disposal of waste (*)

Land building _____ Landfilling X

(b) Indicate the present dimension of the site (metre)

Height/depth	33m
Length	319 m
Breadth	186m

6. Indicate the applicable waste types and quantities salvaged during the year

Salvaging undertaken?		Yes	No
Type	Quantity (m^3)	Type	Quantity (m^3)
Paper/wood fibre		Rubber	
Plastics		Textiles	
Glass		Iron	
Copper		Aluminium	
Zinc		Lead	
Phosphogypsum		Fly-ash	
Waste for composting		Food residues	
Flammable gases		Other	
Other		Other	
Other		Other	

7. Indicate the types, sources and approximate quantities of available covering material (*)

Type	Sources	Quantity (m^3)
Soil		
Sand		
Ash		
Gravel		
Clay		
Building rubble		
Other (Specify)		

I, the undersigned, declare that the information stated above is to my knowledge a true reflection of the status at the Shongweni waste disposal facility.

Signature: _____

Name: SHIMAL HANUWANTH

Capacity: SENIOR SITE OFFICER

Place: DURBAN. Date 20/02/2019.

Batho pele- putting people first

APPENDIX D: POD Liquid management model update (April 2019)

AUTHORITIES REGI...
Clive, Shimal, Kas & Neil
EMAILED TO DEPOT MANAGER
14.06.19

SAVED ON DOC.IT
14.06.19

ENVIROSERV
WASTE MANAGEMENT

Ref no: 12/9/11/L1200/4

12/9/11/L1200/4

13 June 2019

The Director Licensing
Department of Environmental Affairs
Cnr. Soutpansberg and Steve Biko Road
Arcadia, Pretoria

DEPT ENVIRONMENTAL AFFAIRS
RECEIVED
2019 -06- 14
CD: HAZ WASTE MNG & LICENCING

Attention: Mr Lucas Mahlangu

Dear Mr Mahlangu

RE: SHONGWENI LANDFILL SITE: LIQUID MANAGEMENT MODEL END APRIL 2019

Kindly find attached the above-mentioned Liquid Management Model for your attention.

Yours faithfully,

Nosiphiwo Mtyenene
Compliance Administrator
Tel: 011 456 5400
nosiphiwo.mtyenene@enviroserv.co.za

Acknowledgement of Receipt:

Sello
Print Name

Signature

Date

ENVIROSERV
WASTE MANAGEMENT

ENVIROSERV IS A PROUD B-BBEE LEVEL 1 CONTRIBUTOR

Ref no: 12/9/11/L1200/4

13 June 2019

The Director Licensing
Department of Environmental Affairs
Cnr. Soutpansberg and Steve Biko Road
Arcadia, Pretoria

Attention: Mr Lucas Mahlangu

Dear Mr Mahlangu

RE: SHONGWENI LANDFILL SITE: LIQUID MANAGEMENT MODEL END APRIL 2019

Kindly find attached the above-mentioned Liquid Management Model for your attention.

Yours faithfully

Neil Brink
National Compliance Manager
Tel: 011 456 5400
neilb@enviroserv.co.za

RAISING THE WASTE GAME

Jones & Wagener
Engineering & Environmental Consultants
59 Bevan Road PO Box 1434 Rivonia 2128 South Africa
tel: 00 27 11 519 0200 www.jaws.co.za email: post@jaws.co.za

EnviroServ Waste Management Pty (Ltd)
TDS
P.O.Box 9385
Edenglen
1613

14 May, 2019

Our Ref: 8358/00
Your Ref:
8358-00_LMM_r0_kp_Summary_201904.docx

Attention: **Mr Clive Kidd**
Copies to: Rhyno Gouws, Nico Vermeulen

Dear Sir

SHONGWENI LANDFILL SITE – LIQUID MANAGEMENT MODEL UPDATE – END APRIL 2019

1. INTRODUCTION

The Shongweni Liquid Management Model (LMM) was set up to allow EnviroServ Waste Management to quantify the available leachate storage on site as well as to predict the rate of use of storage capacity. The LMM uses the measured leachate and stormwater stored on site, the climatic variables (rainfall and evaporation) and measured pump rates to calculate the nett liquid balance for the storage system. Historic trends are then used to generate a predictive model to assess the capacity of future leachate storage requirements. The main inputs and results are summarised under the headings below.

2. RAINFALL

Refer to Graph 1 – Shongweni Landfill Rainfall Record. This curve plots the cumulative measured rainfall from May 1999 to present against the average expected rainfall based on historical hydrological data. It also summarises the annual rainfall from May 1999 to April 2019. Quality of data is assured by the fact that the data is compared to historic annual averages. For the current hydrological year starting in October 2018 there has been 943 mm rain measured on site.

3. STORMWATER

Refer to Graph 2 – Shongweni Stormwater Dam Val 1: Total Volume Stored; and Graph 3 – Shongweni Stormwater Dam Val 2: Total Volume Stored. This curve plots the measured volume of stormwater stored against the available stormwater storage capacity. Quality of data is assured by the fact that a surveyor measures the water level on each of the dams on a monthly basis. Stormwater stored at the end of April 2019 for the Stormwater Dam Valley 1 was 17 519 m³ (Figure 2) and for the Stormwater Dam Valley 2 was 12 927 m³ (Figure 3). The measured stormwater volumes on site exceed the capacities of both stormwater dams. Stormwater reduction measures need to be implemented urgently to ensure sufficient capacity of the stormwater dams for additional rainfall.

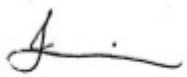
4. LEACHATE

Refer to Graph 4 – Shongweni Leachate Tanks Total Volume Stored. This curve plots the historic leachate stored volume vs the leachate storage capacity. Quality of data is assured by the fact that a surveyor measures the leachate level on each of the dams on a monthly basis. Leachate stored at the end of April 2019 was 7 120 m³.

5. RECOMMENDATION

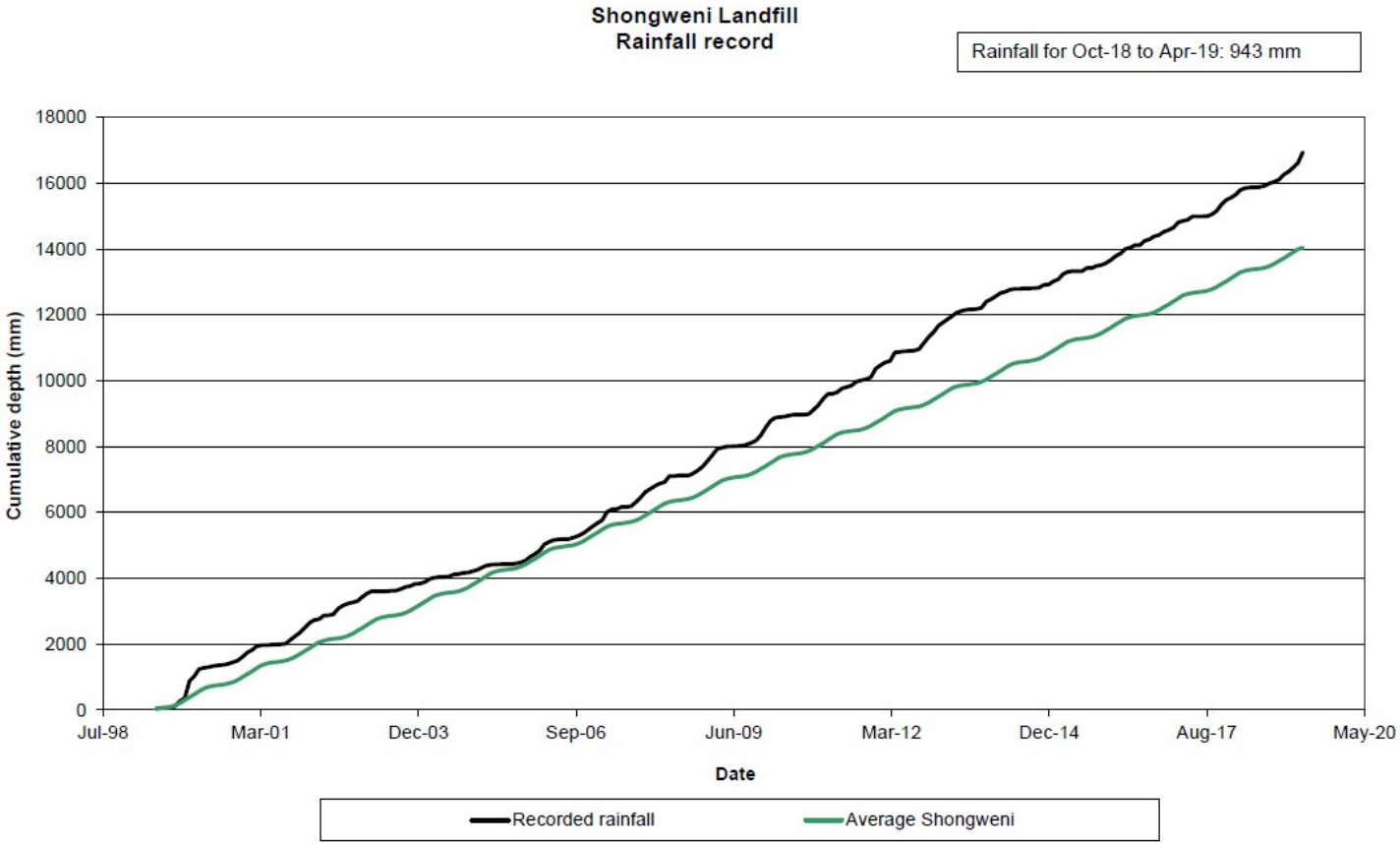
Measures implemented to reduce the leachate levels on site have been successful. However, both stormwater dams are at full capacity due to the high rainfall experienced for the months of February, March and April. Action therefore needs to be taken to reduce stormwater levels on site. The LMM data should continue to be collected and the predictive model continually calibrated.

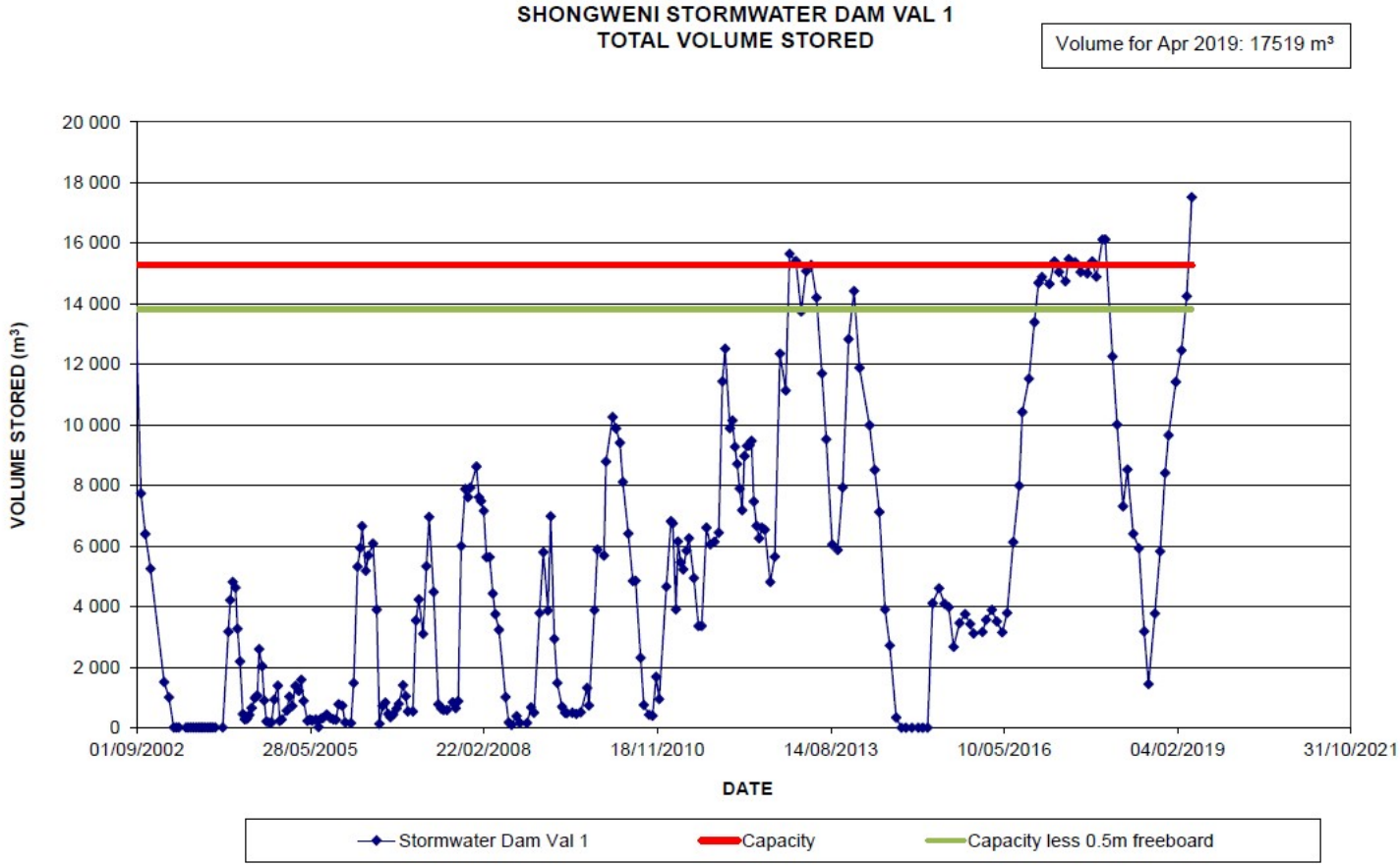
Yours faithfully

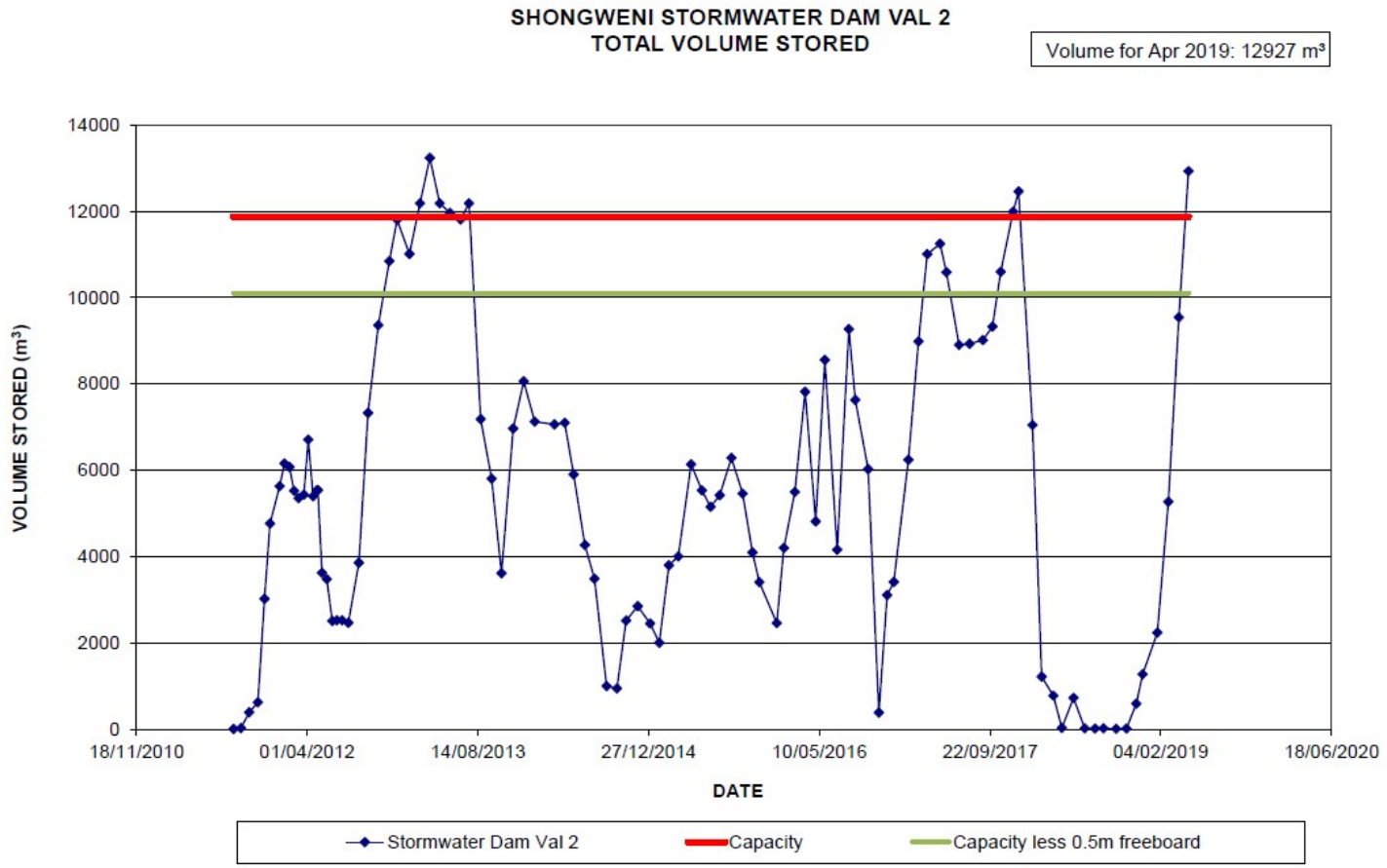


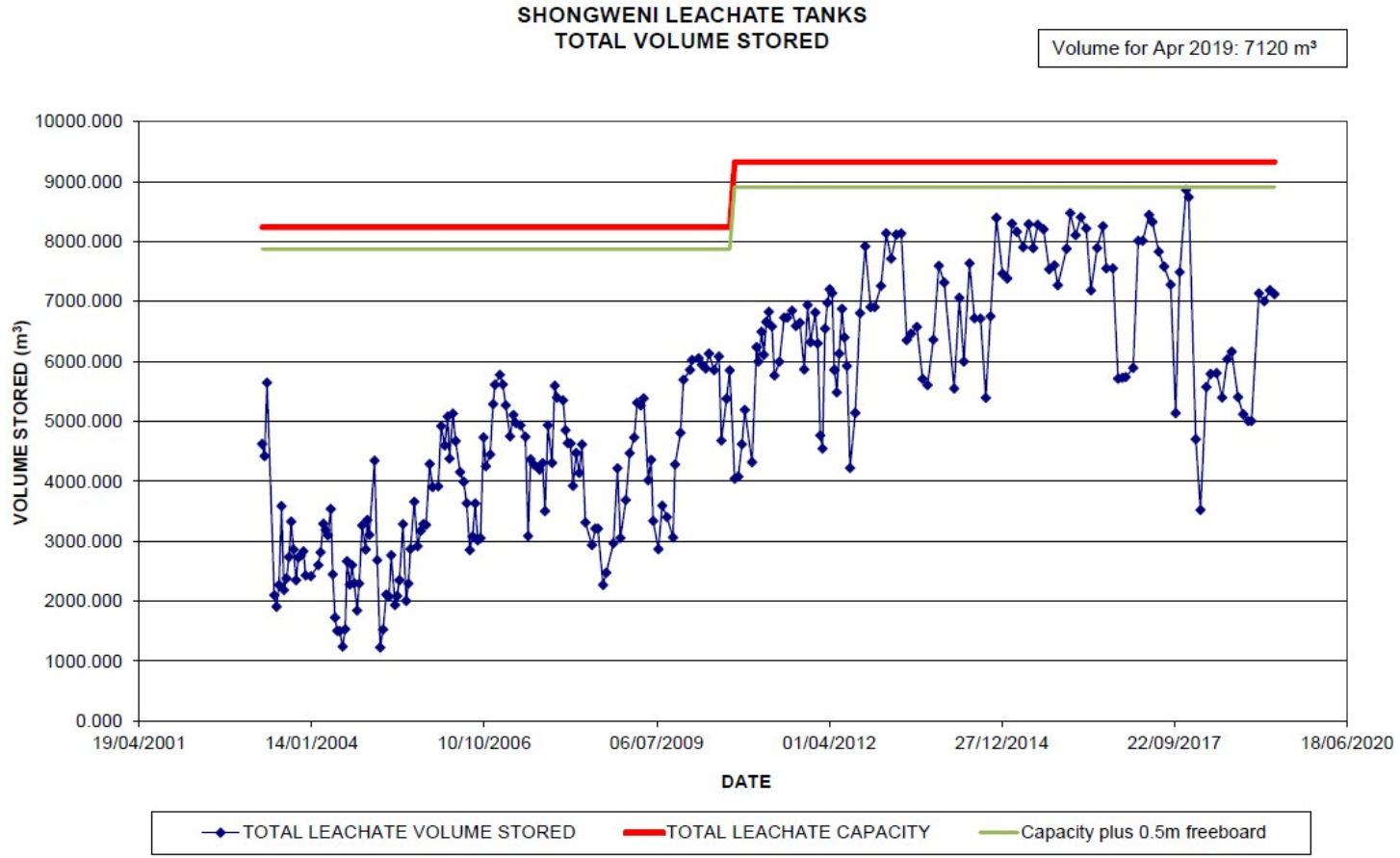
Jabulile Msiza PrEng
for Jones & Wagener

Document source: https://joneswagener.sharepoint.com/JonesWagenerProjects/8358DTSHONGSITECOSTS/Shared Documents/00-General/Monitoring/Reports/8358-00_LMM_r0_kp_Summary_201904.docx
Document template: Normal.dotm


Shongweni Landfill
Rainfall record
Rainfall for Oct-18 to Apr-19: 943 mm
Cumulative depth (mm)
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
Jul-98
Mar-01
Dec-03
Sep-06
Jun-09
Mar-12
Dec-14
Aug-17
May-20
Date
Recorded rainfall
Average Shongweni


SHONGWENI STORMWATER DAM VAL 1
TOTAL VOLUME STORED
Volume for Apr 2019: 17519 m³
VOLUME STORED (m³)
20 000
18 000
16 000
14 000
12 000
10 000
8 000
6 000
4 000
2 000
0
01/09/2002
28/05/2005
22/02/2008
18/11/2010
14/08/2013
10/05/2016
04/02/2019
31/10/2021
DATE
Stormwater Dam Val 1
Capacity
Capacity less 0.5m freeboard


SHONGWENI STORMWATER DAM VAL 2
TOTAL VOLUME STORED
Volume for Apr 2019: 12927 m³
VOLUME STORED (m³)
14000
12000
10000
8000
6000
4000
2000
0
18/11/2010
01/04/2012
14/08/2013
27/12/2014
10/05/2016
22/09/2017
04/02/2019
18/06/2020
DATE
Stormwater Dam Val 2
Capacity
Capacity less 0.5m freeboard


SHONGWENI LEACHATE TANKS
TOTAL VOLUME STORED
Volume for Apr 2019: 7120 m³
VOLUME STORED (m³)
10000.000
9000.000
8000.000
7000.000
6000.000
5000.000
4000.000
3000.000
2000.000
1000.000
0.000
19/04/2001
14/01/2004
10/10/2006
06/07/2009
01/04/2012
27/12/2014
22/09/2017
18/06/2020
DATE
TOTAL LEACHATE VOLUME STORED
TOTAL LEACHATE CAPACITY
Capacity plus 0.5m freeboard

APPENDIX E: Complaints register

COMPLAINTS: JUNE 2018								
DETAILS OF COMPLAINT / QUERY	**COMPLAINANT NAME/ CONTACT NUMBER**	**DATE**	**TIME**	**ADDITIONAL COMMENTS**	**LOGGED BY**	**WIND SPEED m/s**	**WIND DIRECTION**	**Address**
Stop poisoning our homes your end will come . Your remediation didn't fix the problem. That the DEA minister is a criminal . This is seems like a government agenda to make us leave or die. We're suffering everyday , every night . You people aredevils. The air is unbearable , my skin burns, my lungs hurts , I'm sick you are guilty of never ending torture and destruction . You may think you will get away with these acts of abomination thanks to your freemasonic gods and your father the devil, but you're in for a suprise when your shit vapor of a life is over and then the judgement.		27-Jun-18	5h55	Shongweni contact Us request - No repy email	OM			

COMPLAINTS: JULY 2018								
DETAILS OF COMPLAINT / QUERY	COMPLAINANT NAME/ CONTACT NUMBER	DATE	TIME	ADDITIONAL COMMENTS	LOGGED BY	WIND SPEED m/s	WIND DIRECTION	Address
Odour in Hillcrest area	Errol Van Vyk - 0834603947	12-Jul-18	11h23	Complainant has been contacted.	OM			Hillcrest
Bad smell coming from the landfill site.	Sabelo Mchunu Cell:0786994612	21-Jul-18	7h00	Message from global call centre	OM			Kwandengezi-Pitoli
Stink Shongweni area	I. King 0832392368	28-Jul-18	11h24	Complaint acknowledged and reference, (date and time of complaint), provided to complainant.	OM	2.7	E	Shongweni flea market

COMPLAINTS: AUGUST 2018								
DETAILS OF COMPLAINT / QUERY	**COMPLAINANT NAME/ CONTACT NUMBER**	**DATE**	**TIME**	**ADDITIONAL COMMENTS**	**LOGGED BY**	**WIND SPEED m/s**	**WIND DIRECTION**	**Address**
We are suffering, you are killing us. Your landfill is poisoning the air all the time. The air is acidic, bitter. Your remedial measures were not successful, the odour is less but the poison is more. You bastards will pay.	JANSEN	06-Aug-18	11H27	Message from global call centre - CAS-259142-B6G2D2	OM			CRM NOTIFICATION
He wants to know if the shongweni site is open.	Chris Harrison 0836270678	26-Aug-18	21h48	Makgabo will contact the complainant.	OM			Global centre
COMPLAINTS: September 2018								
DETAILS OF COMPLAINT / QUERY	**COMPLAINANT NAME/ CONTACT NUMBER**	**DATE**	**TIME**	**ADDITIONAL COMMENTS**	**LOGGED BY**	**WIND SPEED m/s**	**WIND DIRECTION**	**Address**
Hi we are having a very bad smell here please we need to sleep.	Mbongeni Linda	02-Sep-18	20h45		OM	1.3	N	kwaNdengezi area

COMPLAINTS: OCTOBER 2018								
DETAILS OF COMPLAINT / QUERY	**COMPLAINANT NAME/ CONTACT NUMBER**	**DATE**	**TIME**	**ADDITIONAL COMMENTS**	**LOGGED BY**	**WIND SPEED m/s**	**WIND DIRECTION**	**Address**
Your dump is stinking again. Just drove from Shongweni market. Chemical stench blatantly obvious on Road between Shongweni Polopony club and Shongweni farmers market.	Hayden Johnson 0832629350	06-Oct-18	11h30	Complaint acknowledged and reference, (date and time of complaint), provided to complainant. No Operations on site. CK and with family in area at exact time of complaint received. No odour evident.	OM	0	ESE	Shongweni farmers Market
Reporting terrible stench that ruined our Saturday morning at Shongweni Market this morning. Our friends from UK are horrified that this has been happening for this long , and that with all the complaints it still continues. Please have a heart and face this disaster that is happening . Regards Mrs Clark	Mrs Clair Clark 0837933749	06/10/2018 complaint received Monday the 8th @8h25am	10h00	Complaint acknowledged and reference, (date and time of complaint), provided to complainant. No Operations on site. CK and with family in area at exact time of complaint received. No odour evident. Complaint	OM	0	ESE	Shongweni farmers Market

				received Monday the 8th of October.				
Smell is putrid coming from the landfill. Have had to go to bed, it has made me feel so ill. We cannot live like this.	Glenda Caine 0640231767	06/10/2018 complaint received Monday 8th @9h55am		Complaint acknowledged and reference, (date and time of complaint), provided to complainant. No Operations on site. CK and with family in area at exact time of complaint received. No odour evident. Complaint received Monday the 8th of October.	OM	0.4	ENE	message from global call centre
There is a bad smell in Nqutu Road, Hillcrest	0732325117	08-Oct-18	20h26	Complaint acknowledged and reference, (date and time of complaint), provided to complainant.	OM	4	NE	Hillcrest

COMPLAINTS: NOVEMBER 2018								
DETAILS OF COMPLAINT / QUERY	**COMPLAINANT NAME/ CONTACT NUMBER**	**DATE**	**TIME**	**ADDITIONAL COMMENTS**	**LOGGED BY**	**WIND SPEED m/s**	**WIND DIRECTION**	**Address**
Sunday 11 November 2018 11:30am Smelt the toxic odour consistent with Enviroserv smell again.	0837089157 Sharon VD Westhuizen	11-Nov-18	11h30	Complaint received 13 November 2018 @ 9:34pm. Complaint acknowledged and reference, (date and time of complaint), provided to complainant.	OM	0.9	SE	9 Bowles Road Assagay
COMPLAINTS: DECEMBER 2018								
DETAILS OF COMPLAINT / QUERY	**COMPLAINANT NAME/ CONTACT NUMBER**	**DATE**	**TIME**	**ADDITIONAL COMMENTS**	**LOGGED BY**	**WIND SPEED m/s**	**WIND DIRECTION**	**Address**

COMPLAINTS: JANUARY 2019								
DETAILS OF COMPLAINT / QUERY	COMPLAINANT NAME/ CONTACT NUMBER	DATE	TIME	ADDITIONAL COMMENTS	LOGGED BY	WIND SPEED m/s	WIND DIRECTION	Address
COMPLAINTS: FEBRUARY 2019								
DETAILS OF COMPLAINT / QUERY	COMPLAINANT NAME/ CONTACT NUMBER	DATE	TIME	ADDITIONAL COMMENTS	LOGGED BY	WIND SPEED m/s	WIND DIRECTION	Address
COMPLAINTS: MARCH 2019								
DETAILS OF COMPLAINT / QUERY	COMPLAINANT NAME/ CONTACT NUMBER	DATE	TIME	ADDITIONAL COMMENTS	LOGGED BY	WIND SPEED m/s	WIND DIRECTION	Address

COMPLAINTS: APRIL 2019								
DETAILS OF COMPLAINT / QUERY	**COMPLAINANT NAME/ CONTACT NUMBER**	**DATE**	**TIME**	**ADDITIONAL COMMENTS**	**LOGGED BY**	**WIND SPEED m/s**	**WIND DIRECTION**	**Address**
COMPLAINTS: MAY 2019								
DETAILS OF COMPLAINT / QUERY	**COMPLAINANT NAME/ CONTACT NUMBER**	**DATE**	**TIME**	**ADDITIONAL COMMENTS**	**LOGGED BY**	**WIND SPEED m/s**	**WIND DIRECTION**	**Address**
Shocking smell tonight. Consistent with Enviroserv dump smell at 20H55 on Monday 27/05/19 . ***(Complaint received 13h08 on 28/05/2019)***	0837089157	27-May-19	20H55	Complaint acknowledged and reference, (date and time of complaint), provided to complainant.	OM	1.8	SSW	9 Bowles Road Assagay

APPENDIX F: Incidents register

Incident Status Report

Record Number	Department Responsible	Describe what happened	Estimated incident severity	Date of the incident	Date Created	Incident Status	Incident sign off date	Incident sign off by
5710	EnviroServ - EWM South Africa - KwaZulu-Natal - Shongweni Landfill	Whislt conducting security patrol, it was found that the cable was missing between the gate and concrete fence (approximately 40m)	Level 2 – Marginal	2019-05-20	2019-05-22	Initial report		
5664	EnviroServ - EWM South Africa - KwaZulu-Natal - Shongweni Landfill	Due to extreme rainfall conditions the storm water dams on site reached their holding capacity, with Valley 2 Storm water Dam overflowing into the environment and Valley 1 dam having a minor overflow due to a blocked clean water drain overflowing into the contaminated catchment area.	Level 2 – Marginal	2019-04-23	2019-04-24	Incident signed off	2019-04-29	Clive Kidd Coastal Operations Manager
5487	EnviroServ - EWM South Africa - KwaZulu-Natal - Shongweni Landfill	2 operators developed a skin rash from what can be assumed resulted from skin contact with the ash	Level 1 – Negligible	2018-11-29	2018-12-11	Incident signed off	2019-02-05	Shimal Hanuvanth Regional SHEQ Manager - KZN
5482	EnviroServ - EWM South Africa - KwaZulu-Natal - Shongweni Landfill	Poalo, the energy system technician (subcontractor) was walking on the temporary plastic liner in valley 2 during the gas sampling activity of the gas wells. He slid on the liner and stretched his back while he was trying to gain the balance.	Level 1 – Negligible	2018-11-26	2018-12-10	Incident signed off	2019-02-01	Shimal Hanuvanth Regional SHEQ Manager - KZN
5451	EnviroServ - EWM South Africa - KwaZulu-Natal - Shongweni Landfill	Driver Zamani Mkhize was working with assistant Herbet Mkhize on Roro C3119. They were at the New England landfill site to off-load a (31m/3) bin. After the assistant removed the net off the bin and when came down a scavenger hit him with a stone on his forehead.	Level 3 – Serious	2018-11-15	2018-11-15	Incident signed off	2019-03-22	Merlyn Govender Fleet Manager

5398	EnviroServ - EWM South Africa - KwaZulu-Natal - Shongweni Landfill	Hired vehicle rolled into the storm water dam on valley 2.	Level 2 – Marginal	2018-10-18	2018-10-19	Incident signed off	2019-02-05	Shimal Hanuvanth Regional SHEQ Manager - KZN
5356	EnviroServ - EWM South Africa - KwaZulu-Natal - Shongweni Landfill	Windstorm on vicinity of the site caused the upliftment of the roof of Tank 1 in the Tank Farm causing the southern half of the roof structure to fold over onto the Northern half, exposing the underlying corroded galvanised roof sheeting. Further a tree was blown ove near the site entrance landing on the dog kennals causing minor damage.	Level 3 – Serious	2018-09-25	2018-09-26	Incident signed off	2018-11-19	Clive Kidd Coastal Operations Manager
5248	EnviroServ - EWM South Africa - KwaZulu-Natal - Shongweni Landfill	Fire equipment checklist indicates that most fire extinguishers are obstructed and the others insecure for the past 6 months and there has been no remedial action taken.	Level 1 – Negligible	2018-07-17	2018-07-17	Incident signed off	2019-03-22	Shimal Hanuvanth Regional SHEQ Manager - KZN
5247	EnviroServ - EWM South Africa - KwaZulu-Natal - Shongweni Landfill	First aid inspection register was checked. The register for June was not completed.	Level 1 – Negligible	2018-07-17	2018-07-17	Incident signed off	2019-03-22	Shimal Hanuvanth Regional SHEQ Manager - KZN
5164	EnviroServ - EWM South Africa - KwaZulu-Natal - Shongweni Landfill	Driver Bethuel Bhengu driving Roro C3119 and was pulling trailer 964. He was on his way back from Holfontein and he pulled off to rest at Lions Park (Ashburton). Two tyres were stolen from the trailer.	Level 1 – Negligible	2018-05-09	2018-05-17	Incident signed off	2018-08-07	Merlyn Govender Fleet Manager
5149	EnviroServ - EWM South Africa - KwaZulu-Natal - Shongweni Landfill	Shimal was assisting PR team with using the gilotene. she cut her thumb on the right hand.	Level 1 – Negligible	2018-05-10	2018-05-10	Incident signed off	2018-08-08	Shimal Hanuvanth Regional SHEQ Manager - KZN

APPENDIX G: Ethekwini Discharge Permit

TRADING SERVICES
Water & Sanitation Unit
3 Prior Road, Durban 4001
P O Box 1038, Durban, 4000
Tel: 031 311 8077, Fax: 031 311 8080
www.durban.gov.za

Enviroserv Waste Management (Pty) Ltd (Shongweni)
P.O. Box 15005
Ashwood
3608

PERMIT TO DISCHARGE TREATED CONTAMINATED STORM WATER DELIVERED BY ROAD HAULAGE TO SOUTHERN WASTEWATER TREATMENT WORKS (SWWTW)

Name of Company : Enviroserv Waste Management (Pty) Ltd

Physical Address : 8 Main Road 461 (Shongweni Dam Road)

A. Enviroserv Waste Management (Pty) Ltd is hereby permitted in terms of Section 25/1 of the eThekwini Municipal Sewage Disposal Bylaws to discharge treated contaminated storm water resulting from Enviroserv's Semi Hazardous Landfill Site delivered by Abusanele, to the trade effluent tanker disposal facility at Southern Wastewater Treatment Works at a total monthly discharge volume not exceeding 7 500 kℓ/month subject to the conditions of this permit.

B. Number of tanker loads permitted for the period of permit: 250 loads per month.

C. This permit is valid for the period from 01 February 2019 to 31 January 2020.

D. The permitted vehicle as per the tanker and volume registered with eThekwini Water & Sanitation Pollution and Environment Branch.

E. Special Limits : None

F. Relaxations : None

G. Special Conditions : The conditions embodied in the attached schedule require certain actions to be completed. The Professional Technologist: Mobile Effluent Division of the Municipality reserves the right to carry forward any outstanding actions required in these conditions into any future permits.
Permit subject to signed indemnity agreement by both hauler and the source company that is acceptable to the Municipality.
Permit subject to compliance with Regulations for the Operation of Road Haulage (Attached).

SIOBHAN JACKSON
DEPUTY HEAD: SCIENTIFIC SERVICES
Date : 24 January 2019
Enquiries : Banzi Mbatha
Telephone : 031 311 5986
Reference : 9064

ANNEXURE TO SECTION G OF THE ENVIROSERV WASTE MANAGEMENT (PTY) LTD PERMIT TO DISPOSE OF LANDFILL SITE TREATED CONTAMINATED STORM WATER BY AN APPROVED ROAD HAULIER TO THE SOUTHERN WASTEWATER TREATMENT WORKS (SWWTW) SEA OUTFALL

G.1 This permit is subject to compliance with the regulations and/or procedures for the operation of road haulage vehicles within eThekwini Municipal facilities as may be amended from time to time.

G.2 The permit holder shall ensure that pH, Temperature, sulphides, conductivity and toxicity tests are carried out (per batch sent) by a suitably qualified laboratory acceptable to the Municipality on the landfill site's treated contaminated storm water in order to ascertain the minimum acceptable toxicant dilution (Toxicity) using gametes of the sea urchin. The results shall be forwarded in a signed Certificate of Analysis to the Professional Technologist – Mobile Effluent Division, Pollution and Environment Branch prior to acceptance of the batch by the Municipality. Any changes to the volume and/or composition of the batch which was the subject of the tests, must be approved prior to discharge by the Professional Technologist for the Mobile Effluent Division.

G.3 The permit holder shall analyse water quality variables at a frequency detailed in Table 1 below. The highlighted determinants/limits are adopted from the Coastal Water Discharge Permit (CWDP) for SWWTW and Schedule B Limits from eThekwini Municipal Sewage Disposal Bylaws.

Table 1: Parameters to be monitored and their frequency

ITEM	WATER QUALITY VARIABLE	FREQUENCY	Limits from Schedule B	Limits from CWDP	UNIT
1	pH	Per Load	5.5<pH<9.5		-
2	**EC**	Per Load		**5000**	mS/m
3	**Chemical Oxygen Demand**	Monthly		**9139**	mgO_2/ℓ
4	**Suspended Solids**	Monthly		**1866**	mg/ℓ
5	Sulphides	Per Batch	1		mg/ℓ
6	Heavy Metals (Cr, Mn, Co, Cu, Ni, Zn, Pb, As, Cd)	Monthly	As per attached Schedule B limits		mg/ℓ
7	**Free & Saline Ammonia as N**	Weekly		**57.9**	mgN/ℓ
8	Sulphates	Monthly	250		mg/ℓ

9	**Phenol**	Monthly		**3**	mg/ℓ
10	Total Cyanide	Monthly	10		mg/ℓ
11	Soap, Oil and Grease	Monthly	50		mg/ℓ
12	BTEX	Quarterly	4		mg/ℓ
13	Toxicity	Per Batch	200		MATD
14	Temperature	Per Load	44		°C
15	**Orthophosphate**	Weekly		**13.3**	mg/ℓ
16	Mercury (Hg)	Weekly	0.05		mg/ℓ
17	Settleable Solids	Per Batch	2		mg/ℓ

The permit holder shall ensure that all sampling techniques and analytical methods are performed in agreement with the Professional Technologist – Mobile Effluent Division, Pollution and Environment Branch, and P O Box 1038, Durban 4000.

G.4 The permit holder shall ensure that no leachate or untreated contaminated storm water is discharged via the SWWTW. This includes provision of certificate of cleanliness for each tanker before commencing with hauling of treated contaminated storm water.

G.5 The results of water resource monitoring in the vicinity of the site, as performed for the requirements of the Department of Environmental Affairs' Landfill Site Licence, shall be submitted to the Professional Technologist – Mobile Effluent Division, Pollution and Environment Branch by 30 December each year.

G.6 Enviroserv Waste Management (Pty) Ltd is to commission an appropriately-qualified independent consultant to assess the liquid management plan site every six months, to formulate a report and an action plan to deal with the recommendations thereof.

G.7 The permit holder shall ensure that the treated contaminated storm water fully complies with Schedule B of the Sewage Disposal Bylaws (annexed hereto) and does not compromise the Coastal Water Discharge Permit (CWDP) issued to SWWTW by the Department of Environmental Affairs.

G.8 The permit is subject to a signed indemnity agreement acceptable to the Municipality by both hauler and the permit holder.

G.9 No treated contaminated storm water shall be accepted for discharge into the sea outfall unless it complies with the conditions stated in this permit. The effluent shall not contain concentrations of substances in excess of those stated above. Failure to comply with the stated requirements will result in the **REVOCATION OF DISCHARGE PERMIT** with immediate effect.

SCHEDULE B
ACCEPTANCE OF TRADE EFFLUENT FOR DISCHARGE EITHER DIRECTLY OR INDIRECTLY INTO SEA OUTFALLS

No trade effluent shall be accepted for discharge into the sea outfall unless it complies with the following conditions. The effluent shall not contain concentrations of substances in excess of those stated below—

SEA OUTFALL QUALITY LIMIT			***UNIT***
1.	Temperature	44	°C
2.	pH	5,5 < pH < 9,5	
3.	Settleable solids	2	mg/ℓ
4.	Oils, greases and waxes of mineral origin	50	mg/ℓ
5.	Arsenic (expressed as As)	5	mg/ℓ
6.	Cadmium (expressed as Cd)	1,5	mg/ℓ
7.	Total chromium (expressed as Cr)	3	mg/ℓ
8.	Copper (expressed as Cu)	3	mg/ℓ
9.	Lead (expressed as Pb)	5	mg/ℓ
10.	Mercury (expressed as Hg)	0,05	mg/ℓ
11.	Cyanides (expressed as CN)	10	mg/ℓ
12.	Nickel (expressed as Ni)	10	mg/ℓ
13.	Zinc (expressed as Zn)	20	mg/ℓ
14.	Sulphide (expressed as S^{2-})	1	mg/ℓ
15.	Sulphates in solution (expressed as SO_4)	250	mg/ℓ
16.	Toxicity as Minimum Acceptable Toxicant Dilution	200	Number of dilutions
17.	Benzene, Toluene, Ethyl Benzene and Xylene	4	mg/ℓ

APPENDIX H: Notification of an environmental emergency

Monty

From: Clive Kidd <CLIVEK@enviroserv.co.za>
Sent: Tuesday, 23 April 2019 4:52 PM
To: 'Lucas Mahlangu'; neil.larat@durban.gov.za; Phumzile Vezi (Phumzile.Vezi@durban.gov.za); sanjay.naraindass@durban.gov.za; Joyce Hammond (Joyce.Hammond@durban.gov.za); NOMPUMELELO GUMEDE (NOMPUMELELO.GUMEDE@durban.gov.za)
Cc: Esme Gombault; Neil Brink; Shimal Hanuvanth
Subject: NOTIFICATION OF AN INCIDENT

Good Day All,

We hereby report an incident in terms of our WML condition 9 and STP conditions 1.6 and 8.

During the last 36 hours extreme rainfall conditions prevailed over the greater Durban area. At Shongweni we received 249 mm of rain during a 24 hour period which is in excess of a 1in 50 year rainfall event.

The result of this event was that the stormwater dams on site reached their holding capacity, with Valley 2 Stormwater Dam overflowing into the environment and Valley 1 dam having a minor overflow due to a blocked clean water drain overflowing into the contaminated catchment area. This blockage was caused by a tree that dislodged during the heavy rains.

Samples have been taken of both dams as well as the river downstream of the site. Whilst these samples will be sent for comprehensive analysis, initial tests of the downstream sample carried out in our on-site laboratory returned a pH of 6.79 and an EC of 0.44mS/cm, which is well within the river discharge standard and similar to the background trends monitored.

In light of these results this event does not constitute a significant health, safety or environmental risk.

Regards,

Clive Kidd
Regional Operations Manager - Coastal

t +27 11 456 5425
f +27 31 769 1171
m +27 82 779 6318
e CLIVEK@enviroserv.co.za

Customer Care
+27 (0) 800 192 783

1

APPENDIX J: UHA Complaints