

**Umlazi Hh Landfill Site,
KwaZulu Natal
External Compliance and
Environmental Audit
April 2009**

Report prepared for:

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Executive Summary

In terms of its permit, the Umlazi Hh Landfill must be audited annually by an independent external auditor: this audit is the third undertaken by Environmental and Chemical Consultants and was accomplished over a period of one day, 29th April 2009.

Two audit forms have been developed by the auditor. The first is the *Compliance Audit Form*, which is simply a listing of all the requirements of the Umlazi Landfill Site Permit and any subsequent amendments. The second audit form, the *Environmental Management Form*, is based on the ISO 14001, Environmental Management System. The latter is important as various management systems and requirements must be in place in a company to ensure that it can comply with not only its permit requirements but also the companies own internal policies and procedures.

The landfill site conforms well to its permit requirements but 2 partial compliances and 3 non-compliances were noted. This means that the Site is was 96.7%, which is higher than the 93.8% compliance noted in the April 2008 audit.

The following conclusions and recommendations were made:

- (i) The construction to closure work has resulted in a number of permit conditions becoming redundant or, at least, requiring up-dating, e.g. conditions 2.1.1 to 2.1.3; 3.3.4.6; 4.1.5; 5.2.2; 5.2.3; and 5.2.4. It is recommended that now that the site is closed, application should be made to the Department of Environment Affairs and Tourism to have the permit updated.
- (ii) During the site visit, the construction to closure work was inspected visually by the auditor and it appeared to be excellent. The aerial photographs of the site supplied to the auditor show that once all the grass has grown will blend in well with the topography of the area.
- (iii) Permit condition 2.2.3 requires that the site must be rehabilitated in such a manner that the community will be able to utilise it for recreational activities. This has been done but recreational use has not been decided with the community.
- (iv) The leachate dam was removed from the site and all leachate now drains directly into the downstream sewer. This is an excellent development, as the integrity of the leachate dam was questionable and proper control of the leachate can be maintained, as relatively lower volumes of clean surface water will enter the leachate waste stream.
- (v) A temporary residential development has been built near the site. Discussions with the municipality have been held and they have promised to erect a fence about 400m from the site boundary to restrict development and entry onto the buffer zone and the site.
- (vi) A new sign in both English and Zulu, which meets permit condition 3.3.3.1 was available inside the site and was being erected at the time of the audit
- (vii) No odour complaints were received during this audit period.
- (viii) No on-site and offsite air quality and dust measurements have been carried out required by conditions 7.1 and 7.2, although now that the site is capped and closed, this requirement does not seem to be necessary.

- (ix) The amount and concentrations of methane, carbon dioxide and hydrogen sulphide emitted from the site are very low and, therefore, represents no health, safety and environmental risk to workers or the community.
- (x) The water quality results provided by Jones and Wagener show that the up-stream borehole water is probably being contaminated by both the residential area and to some extent the site. However, the general trend is that the water contamination is decreasing. The contribution from the site should decrease in the future due to the final capping and closure of the site.
- (xi) The required 3 monthly audits required by condition 9.1.2 are now being carried out as requested in the April 2009 audit.

The Site is not having a significant impact on the environment, in terms of possible surface, groundwater or air pollution, although the contamination of the water in the shallow boreholes on the western side of the site need to be closely monitored to ensure that the decrease in conductivity that is apparently being observed continues in the future.



D A Baldwin, PhD

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1 Introduction

The Umlazi H:h Landfill Site is permitted in terms of section 20 (1) of the Environmental Conservation Act, 1989 (Act 73 of 1989) to accept fill material that is normally used for rehabilitation and which has been classified as suitable for disposal at a GB⁺ facility. The original permit for this site, 16/2/7/U602/B1/Y1/P246, was revised on 17th October 2001 plus a new revision was received during this audit period, dated 23 August 2007. All the current permit conditions including the recent changes are listed in the Compliance Audit Checklist given in appendix 1. The permit holder, Enviroserv Holdings (Pty) Ltd., has appointed Dr David A Baldwin of Environmental and Chemical Consultants cc to undertake the external audits of all hazardous waste landfill sites owned by the company. This audit of the Umlazi Hh Landfill is the fourth undertaken by Environmental and Chemical Consultants and was accomplished during a site visit on the 29th April 2009.

In terms of the permit conditions, the audit report must:

- Must specifically state that the conditions of the permit are being adhered to,
- Must include an interpretation of available data and test results regarding the operation of the site.

As is discussed below, the site is now closed and no waste was disposed since the last audit in April 2008.

2 Approach to Audit

The audit was accomplished over a period of one day, 29th April 2009. Present at the audit was the lead auditor, Dr D A Baldwin of Environmental and Chemical Consultants, Mr Clive Kidd and Ms Alma Bowles. The previous audit was undertaken by Environmental and Chemical Consultants in April 2008.

In addition to the Permit requirement that the auditor demonstrate that the Permit Holder complies with the conditions of the Landfill's Closure Permit, Environmental and Chemical Consultants also includes an evaluation of the Company's environmental management system. This is important as various management systems and requirements must be in place in a company to ensure that it can comply with not only its permit requirements but also the companies own internal policies and procedures. A simple example is that the Landfill

Manager must receive the necessary support and funding from the company's Head Office to allow him/her to meet the Permit Conditions and operate the site correctly. The absence of such support would be an early warning sign that the site operations and infrastructure could deteriorate, hence leading to potential environmental problems in the future.

Two audit forms have been developed by the auditor, Dr D A Baldwin. The first is the *Compliance Audit Form*, which is simply a listing of all the requirements of the Umlazi Landfill Site Permit and any subsequent amendments. The second audit form, the *Environmental Management Form*, is based on the ISO 14001, Environmental Management System. Copies of the audit forms completed during the audit are included as Appendices 1 and 2 of this report.

The environmental management audit form considers twelve important areas that can affect the environmental performance of the landfill. These are:

1. Company Environmental Policy and Strategy
2. Organisation
3. Resources
4. Legal Requirements and Company Standards
5. Site and Plant Design
6. Operations and Practices
7. Maintenance
8. Contingency measures
9. Incident Reporting and Remedy
10. Environmental Training and Awareness
11. Contractor Selection and Performance
12. Communication.

3 Future Developments in Legal Requirements

Note that the site is now effectively closed, so any new legal requirements would have little impact on the management of the Site. However, there have been some important developments that would be of interest to anyone concerned with waste management and pollution control.

3.1 Revision of the Minimum Requirements Documents

Department of Environment Affairs and Tourism's project to benchmark SA's classification procedures and the Minimum Requirements against international approaches started on the

9th March 2009 and is expected to be completed by the September 2010. The project will develop a revised approach to the classification of hazardous waste. The auditor is one of the hazardous waste consultants on the project and will inform the monitoring committee and EnviroServ of the progress of the project.

3.2 Publication of the Waste Bill

The Waste Bill was passed during March 2009 and now becomes known as the Waste Act (59 of 2008).

3.3 Waste Tyre Regulations

The waste tyre regulations were published in February 2009, which has the purpose of regulating the management of waste tyres. It is expected that the regulations will generate a number of empowerment jobs, particularly in the collection of the tyres.

4 Main Audit Observations and Comments

The audit included extended discussions with Mr Clive Kidd, Ms Alma Bowles and other members of staff at the site, plus a review of documentation required to assess the status of the site and the compliance to permit conditions and the environmental management system. The results of the audit are given in the audit checklists, copies of which are included Appendices 1 and 2. The overall impression of the Umlazi site was very good, as the site has been capped and closed and the grass has started to cover the final capped area. The weather was fine on the day of the audit: see plates 1 to 4 for photographs taken during the audit and plates 5 and 6 for aerial photographs of the site taken towards the end of the capping work on the 17th July 2008.

- Visual impact was very good;
- The cover used for the capping process appeared to be adequate;
- No odours were observed at time of audit.
- Only maintenance operations were occurring on site, as it is closed for acceptance of permitted waste.
- The fencing was of the correct height and was in good condition.

The site generally complies with the permit conditions and this is reflected in the audit



Plate 1: The new sign in English and Zulu that will be erected at the front gate of the site.



Plate 2: The recently closed area on the site, which has been grassed and hydro-seeded



Plate 3: One of the newly completed drainage channels from the top of the site.



Plate 4: The gas system: the whirly birds were all working at the time of the audit.



Plate 5: Aerial view of the Site during the final stages of the closure construction phase – taken on the 17th July 2008



Plate 6: Aerial view of the entire Umlazi IV Hh Landfill showing the older grassed area to the left and the newly covered area to the right – taken on the 17th July 2008

checklists. The most important issues are discussed below in the approximate order used in the Compliance and Environmental Audit checklists in Appendix 1 and 2, respectively. The reader is referred to appendices 1 and 2 for a complete list of the conditions evaluated during the audit and the conclusions.

4.1 Policy and Strategy

The Site has an accredited ISO 14001 environmental management system and all paper work and operational requirements needed to comply with this system appeared to be in place.

4.2 Legal Requirements and Company Standards

The site complies very well with its permit requirements as can be seen by checklist in appendix 1. The following issues should be noted:

4.2.1 Permit Conditions

There have been no changes to the permit conditions since the last audit. However, the construction to closure work has resulted in a number of permit conditions becoming redundant or, at least, requiring up-dating, e.g. conditions 2.1.1 to 2.1.3; 3.3.4.6; 4.1.5; 5.2.2; 5.2.3; 5.2.4; 7.1; and 7.2. It is recommended that now that the site is closed application should be made to the Department of Environment Affairs and Tourism to have the permit updated.

4.2.2 Permissible Waste

No waste was accepted over this audit period in terms of permit condition 2.1.2. Cover material has been imported from a neighbouring site: see section 4.2.3.

4.2.3 Rehabilitation Work

Aerial views of the rehabilitation work that was almost complete are shown in plates 5 and 6 and the status of the landfill during the audit in plates 1 to 4. Soil that was located off-site next to the soccer pitch was approved for use as cover material for the rehabilitation work and the area can be seen in plate 6 to the right of the soccer pitch. The report by Jones and Wagener approved in condition 1.1(f) guided the rehabilitation work and the cap will be that given in the Minimum Requirements for a GB⁺ site. Note that during the rehabilitation work:

- The leachate dam was removed from the site and all leachate now drains directly into the downstream sewer;

- Drainage channels have been built that can be expected to survive even the heaviest rainfall condition: see plates 3 and 5;
- The rehabilitated area has been grassed on the lower slopes and hydro-seeded along the upper slopes and top: see plate 2;
- Some erosion occurred during one rainfall event but the site is maintained routinely by EnviroServ Tailings Division, which did the rehabilitation work;
- Note that plate 6 shows an aerial view of the whole site, which once all the grass has grown will blend in well with the topography of the area.

During the site visit, the construction to closure work was inspected visually by the auditor and it appeared to be excellent.

4.2.4 Final Use

Permit condition 2.2.3 requires that the site must be rehabilitated in such a manner that the community will be able to utilise it for recreational activities. This has been done but recreational use has not been decided with the community. The borrow area that was used to provide cover material for the capping project has been flattened and could be used by the community if required.

4.3 General Impact Management and Operation of Site

4.3.1 Access Control

- On the day of the audit, no operations were going on and only a security guard and two general workers were present on-site. The security guard pointed out that there was no lock on the gate: an adequate lock must be provided.
- In terms of permit condition 3.3.3.1, weatherproof, durable and legible notices in at least two official languages applicable in the area, must be displayed at each entrance to the Site. A new sign in both English and Zulu, which meets this permit condition was available inside the site and was being erected at the time of the audit: see plate 1.

4.3.2 Buffer Zone

Access by residents of a new temporary residential area near the site is possible: the people have been moved from the area near the new stadium being built for the world cup.

EnviroServ have identified this risk and have taken steps to meet with the community to explain the risks involved and to get their cooperation. The municipality have promised to erect a fence about 400m from the site boundary to restrict development and entry onto the buffer zone and the site. At the time of the audit, there did appear to be some fencing being erected.

4.3.3 Odour

No odour complaints were received during this audit period.

4.3.4 Leachate Disposal

The leachate is now discharged directly to the sewer line to the south of the site with the permission of the authorities and the leachate pond removed. This is an excellent development, as the integrity of the leachate dam was questionable and proper control of the leachate can be maintained, as relatively lower volumes of clean surface water will enter the leachate waste stream.

4.4 Monitoring

4.4.1 Air Quality and Gas

According to permit condition 7.3.1, “Air quality and gas monitoring, as described in conditions 7.1 and 7.2 must continue after closure of the Site until the landfill gas peak concentration of methane and carbon dioxide has been detected, or for any longer period, as may be determined by the Director”. The amount of landfill gas generated by the site is very low, as would be expected because only ash and other non-putrescible wastes have been disposed over the last 10 years.

Low concentrations of methane and carbon dioxide gas were observed from probe 8 on the 6th January 2009. The flow rate was, however, extremely low and was recorded by Margo Saner and Associates as “0”.

The hydrogen sulphide levels in the probes were below the detection limit.

No on-site and offsite air quality and dust measurements are being carried out required in terms of conditions 7.1 and 7.2: note that now the site is closed and capped, the auditor considers such measurements not necessary.

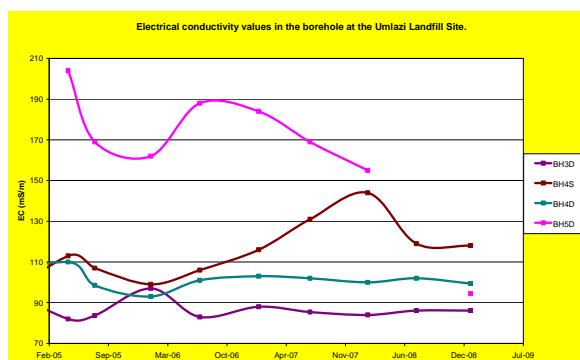
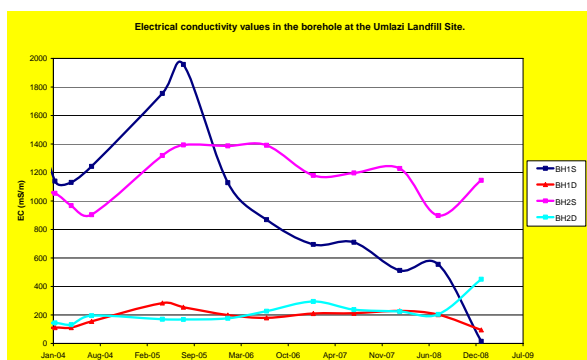
4.4.2 Water Quality Monitoring

An annual report dated July 2008 plus the data up to and including the January 2009 sampling campaign. Note it is a permit condition (13.3.4) that the auditor report the borehole results and provide graphical trends observed for selected analytes.

The semi-volatile organics including PAHs were not analysed by Jones and Wagener in January 2009, because previous work has demonstrated that they are not present in significant amounts. However, Annexure III requires the analysis of these two parameters and, therefore, not undertaking this analysis is, therefore, recorded as a partial non-compliance to condition 6.3.1. It is recommended that EnviroServ write to the Department requesting Annexure III to be changed together with an appropriate motivation.

4.4.2.1 Groundwater

The electrical conductivity data up to January 2009 show the same trends that have been reported previously: see the graphs below which were provided by Jones and Wagener.



There is clearly some contamination of the groundwater at various points around the site but except for the area near BH1S and BH2S on the western side of the site, the contamination is limited and has decreased over the last three years. These two boreholes are located in the Berea Sands and are located upstream of the site and have elevated concentrations of ammonia, chloride, sodium, magnesium and arsenic. At least some of the contamination is coming from off-site and may be associated with the lack of an effective sewage management system. The auditor agrees with Jones and Wagener's conclusion that the capping is likely to lead to reduced contaminant levels over the next few years.

The volatile organic compounds were determined in the ground water and again show that those on the western and to a lesser extent the northern side of the facility are contaminated with benzene and other aromatic hydrocarbons that are usually associated with petrol plus

chlorinated hydrocarbons, such as chloroform and trichloroethylene.

In their annual report dated July 2008, Jones and Wagener recommended that a new borehole pair be drilled within the residential area on the western side of the site and that boreholes BH5S and BH5D be repaired. The repairs to BH5S and BH5D have been done as a sample was recovered from B5D in January 2009. However, the new boreholes in the residential area will only be drilled when the drilling rig becomes available for Shongweni Valley 2.

4.4.2.2 Leachate

There has been a recent increase in the electrical conductivity, which is most likely to be due to the removal of the leachate dam, as the leachate is no longer being diluted by surface water. The leachate is, however, still characterised by elevated concentrations of ammonia, chloride, sodium, potassium, magnesium, arsenic and iron.

4.4.2.3 Surface Water

Comparison of the analytical results on the water collected upstream and downstream from the Isipingo indicates that there is still no significant difference between the samples. The electrical conductivity values and associated inorganic constituents within the Isipingo upstream and downstream samples remain low. In addition, there were no organic constituents detected within the surface water samples.

4.4.3 Auditing

The monthly inspections required by condition 9.1.1 are being carried out by Mr Paul Shult, the site supervisor, and any maintenance that is required is carried out by EnviroServ Tailings.

The required 3 monthly audits required by condition 9.1.2 are now being carried as requested in the April 2009 audit.

5 Conclusions and Recommendations

The audit shows that the Umlazi Hh Landfill is largely meeting its permit conditions and the environmental policy of the company. The site is currently accepting no waste and in the last audit period has been rehabilitated. However, 2 partial and 3 non-compliances were noted out of 120 conditions in the permit that are considered applicable. If two points are

given for compliance, one point for partial compliance and zero points for non-compliance, the percentage compliance to the permit was 96.7%, which is higher than the 93.8% obtained in the previous audit in April 2008.

The following conclusions and recommendations were made:

- (xii) The construction to closure work has resulted in a number of permit conditions becoming redundant or, at least, requiring up-dating, e.g. conditions 2.1.1 to 2.1.3; 3.3.4.6; 4.1.5; 5.2.2; 5.2.3; and 5.2.4. It is recommended that now that the site is closed, application should be made to the Department of Environment Affairs and Tourism to have the permit updated.
- (xiii) During the site visit, the construction to closure work was inspected visually by the auditor and it appeared to be excellent. The aerial photographs of the site supplied to the auditor show that once all the grass has grown will blend in well with the topography of the area.
- (xiv) Permit condition 2.2.3 requires that the site must be rehabilitated in such a manner that the community will be able to utilise it for recreational activities. This has been done but recreational use has not been decided with the community.
- (xv) The leachate dam was removed from the site and all leachate now drains directly into the downstream sewer. This is an excellent development, as the integrity of the leachate dam was questionable and proper control of the leachate can be maintained, as relatively lower volumes of clean surface water will enter the leachate waste stream.
- (xvi) A temporary residential development has been built near the site. Discussions with the municipality have been held and they have promised to erect a fence about 400m from the site boundary to restrict development and entry onto the buffer zone and the site.
- (xvii) A new sign in both English and Zulu, which meets permit condition 3.3.3.1 was available inside the site and was being erected at the time of the audit
- (xviii) No odour complaints were received during this audit period.
- (xix) No on-site and offsite air quality and dust measurements have been carried out

required by conditions 7.1 and 7.2, although now that the site is capped and closed, this requirement does not seem to be necessary.

- (xx) The amount and concentrations of methane, carbon dioxide and hydrogen sulphide emitted from the site are very low and, therefore, represents no health, safety and environmental risk to workers or the community.
- (xxi) The water quality results provided by Jones and Wagener show that the up-stream borehole water is probably being contaminated by both the residential area and to some extent the site. However, the general trend is that the water contamination is decreasing. The contribution from the site should decrease in the future due to the final capping and closure of the site.
- (xxii) The required 3 monthly audits required by condition 9.1.2 are now being carried out.

The Site is not having a significant impact on the environment, in terms of possible surface, groundwater or air pollution, although the contamination of the water in the shallow boreholes on the western side of the site need to be closely monitored to ensure that the decrease in conductivity that is apparently being observed continues in the future.

Appendix 1: Completed Compliance Audit Form

EXTERNAL AUDIT for COMPLIANCE with PERMIT NUMBER, 16/2/7/U602/B1/Y/P246 AND SUBSEQUENT AMENDMENTS
UMLAZI LANDFILL SITE, KWAZULU NATAL: Class Hh with GSB⁺ North Cell

LEAD AUDITOR: Dr D A Baldwin: Environmental and Chemical Consultants cc, P O Box 2856, Cresta, 2118

DATE: 29th April 2009

OTHER EXTERNAL AUDITORS: None

Clause No.	Requirements	Permit Condition Applies (Y/N)	Compliance			Reasons
			Yes	Partial	No	
1.	LOCATION					No permit amendments have been received during this audit period.
1.1	This permit authorises the rehabilitation with the aim of closure of the Umlazi IVI disposal site on Lot 1435 situated on the remainder of Umlazi Reserve number 8309, District of Durban according to the following reports numbered:- a) G108/99/7207 by Jones and Wagener Consulting Civil Engineers, dated November 1999; b) ENV/S-C 98124 by CSIR Cape Water Programme Division for Water, Environment and Forestry Technology, dated December 1998; c) EMAP-C-95061 by CSIR Division of Earth, Marine and Atmospheric Science and Technology, dated August 1995, and d) ENV-S-C 2000-121 by CSIR Cape Water Programme Division for Water, Environment and Forestry Technology, dated September 2000. e) JW198/06/7207 by Jones and Wagener Consulting Civil Engineers dated July 2005 f) JW62/05/8610 by Jones and Wagener Consulting Civil Engineers dated May 2006 g) Umlazi Closed Waste Disposal Site, Air Quality and Landfill Gas Monitoring Programme by Margot Saner and Associates dated 2004 (Hereinafter referred to as “the Reports”, submitted by the Permit Holder.	Y	√			1.1e to 1.1g added 23/08/07 Pravin Amar Development Planners have been investigating the zoning of the site. Apparently, the site is owned by the Provincial Authority.
1.2	The boundaries of the Site must be as indicated by coordinates numbered 1 to 20 on plan number 7207, submitted by the Permit Holder on 10 January 2000.	Y	√			

Clause No.	Requirements	Permit Condition Applies (Y/N)	Compliance			Reasons
			Yes	Partial	No	
2.	FILLING OF THE NORTHERN SECTION					
2.1	Permissible Fill Material					This section is essentially redundant.
2.1.1	Subject to the provisions of condition 2.2.1, the Northern portion of the Site, the boundaries of which are indicated by the co-ordinates numbered 6, 7, 8, 9, 10, 11 and 21 on plan number 7207, submitted by the Permit Holder on 10 January 2000, may be filled by deposition of dry material as described in condition 2.1.2, while approved construction for closure requirements specified in condition 3 are being implemented.	Y	√			
2.1.2	Permissible fill material are gypsum, bark, paper pulp, ash, sawdust, builders rubble as well material that is normally used in the rehabilitation of landfill sites, which have been classified as suitable for disposal at a G:B ⁺ disposal facility according to the latest edition of the "Minimum Requirement" series documents, as published by the Department (hereinafter, referred to as the "Minimum Requirements"), and approved In writing by the Director for acceptance on the northern portion of the Site.	Y	√			Amended 23 rd August 2007 No waste has been disposed at the Umlazi Landfill since the last audit in April 2008.
2.1.3	Except for the fill material approved for acceptance on the northern portion of the Site In terms conditions 2.1.2 and 2.2.1, no waste originating from any other source, including domestic waste, may be disposed of on the Site.	Y	√			
2.2	Closure and Rehabilitation					
2.2.1	The northern portion of the Site may not be used for the disposal of permissible fill material after 31 July 2008, and the entire Site must be rehabilitated by 31 July 2009 in accordance with the requirements for closure and rehabilitation specified in the Minimum Requirements, the Reports, the conditions of this Permit and any other written instruction issued by the Director to the Permit Holder.	Y	√			Amended 23 rd August 2007 The rehabilitation of the site has been completed. Some problems have been experienced with the grassing of the eastern slope and this has lead to some erosion by rain. EnviroServ Tailings are monitoring the site and maintaining it as required.
2.2.2	The rehabilitation of the site must be undertaken in two stages, namely: a) the short/medium-term closure construction stage: the deposition of fill material on the northern portion of the Site, the implementation of engineering measures to prepare the Site for rehabilitation (closure construction) and the management of impacts during this phase according to conditions 2.1.1 and 3, 3; and b) the ongoing and medium to long-term management stage: the maintenance of these measures and the management of impacts according to condition 4	Y	√			

Clause No.	Requirements	Permit Condition Applies (Y/N)	Compliance			Reasons
			Yes	Partial	No	
2.2.3	The site must be rehabilitated in such a manner that the community will be able to utilise it for recreational activities.	Y	√			Apparently, no recreational use plan has been developed with the community. The borrow area that was used to provide cover material for the capping project has been flattened and could be used by the community, if required.
3	CONSTRUCTION FOR CLOSURE STAGE					
3.1	General Construction Requirements					
3.1.1	The construction for closure of the Site must be done in accordance with: a) The requirements specified in the Minimum Requirements. b) The approved Phase II design plans numbered 7207-20 and 7207-21 dated May2001 by Jones and Wagener. c) The report Ref: G108/99/7207 by Jones and Wagener numbered 1.1a above. d) The agreements reached as detailed in the Director Generals letter dated 10 th August 1999: Ref.16/2/7/602/B1/Y1 e) The report ref: JW62/06/7207 by Jones and Wagener Consulting Civil Engineers numbered 1.1(f) above. and any other written instruction issued by the Director to the Permit Holder	Y	√			
3.1.2	Any construction for closure of the Site (proposals), which are not shown on the approved plans, as described in condition 3.1.1, may only be undertaken by the Permit Holder after specified engineering plans have been submitted and approved in writing the Director.	Y	√			Approved.
3.1.3	After construction for closure of the Site is completed according to conditions 3.1.1 and 3.1 the Permit Holder must notify the Director thereof and the person referred to in condition 3.1.3 must submit a certificate or alternatively a letter to the Director that the construction for closure of the Site, as proposed by the Permit Holder and approved by the Director, was also carried out in accordance with recognised civil engineering practice.	Y	√			Jones and Wagener are compiling a construction completion report which should be forwarded to the Department to meet this condition and condition 3.1.4.
3.1.4	After construction for closure of the Site is completed according to conditions 3.1.1 and 3.1.2, the Permit Holder must notify the Director thereof and the person referred to in condition 3.1.1 must submit a certificate or alternatively a letter to the Director that the construction for closure of the Site, as proposed by the Permit Holder and approved by the Director, was carried out in accordance with recognised civil engineering practice.	Y	√			

Clause No.	Requirements	Permit Condition Applies (Y/N)	Compliance			Reasons
			Yes	Partial	No	
3.1.5	An official of the Department and the person referred to in condition 3.1.3 must inspect the completed closure construction works referred to in condition 3.1.4. If the Director is satisfied with the closure construction of the Site, written confirmation will be given that the construction complies with the Minimum Requirements for closure and that the Site is regarded as closed and rehabilitated.	Y	√			The closure works have not yet been inspected by either the Department of Environment Affairs and Tourism and the Department of Water Affairs and Forestry: see the comment on 3.1.3.
3.1.6	The Site must be constructed in accordance with recognised civil engineering practice, which meets the requirements of the Minimum Requirements 2 nd edition with special consideration to stability.	Y	√			
3.2	SPECIFIC CONSTRUCTION MEASURES					
3.2.1	ENGINEERING OF FINAL SHAPE AND COVER					
3.2.1.1	The entire Site must be reshaped in such a manner that the occurrence of erosion is prevented and to facilitate storm water control.	Y	√			
3.2.1.2	The entire Site must be capped in accordance with the approved plans specified in condition 3.1.1 and to at least meet the design specification as detailed in the Minimum Requirements documents.	Y	√			Amended 23 rd August 2007.
3.2.1.3	The capped area must be covered with 200mm topsoil, after which it must be vegetated with indigenous vegetation.	Y	√			
3.2.1.4	The maximum height of the Site shall not exceed 110 metres above mean sea level.	Y	√			The site is below 110 metres above sea level.
3.2.1.5	The slopes of the site must be constructed and maintained in such a manner that the occurrence of erosion is prevented.	Y	√			
3.2.2	CONSTRUCTION OF STORMWATER CONTROL MEASURES					
3.2.2.1	Storm water diversion works constructed in compliance with condition 5.1.2 must be of such a capacity as to accommodate all stormwater 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 fifty years (hereinafter referred to as the "estimated maximum precipitation")	Y	√			
3.2.2.2	Stormwater containments works constructed to collect contaminated stormwater as defined in condition 5.1.4 in compliance with condition 5.1.5 must be of such a capacity as to maintain a freeboard of half a metre and to hold at least two weeks of contaminated stormwater while accommodating all stormwater runoff under maximum precipitation conditions.	Y	√			

Clause No.	Requirements	Permit Condition Applies (Y/N)	Compliance			Reasons
			Yes	Partial	No	
3.2.2.3	Stormwater containments works constructed to collect contaminated stormwater as defined in condition 5.1.4 in compliance with condition 5.1.5 must be lined according to the specifications contained in the Minimum Requirements 2 nd edition documents for hazardous lagoons.	Y	√			
3.2.3	CONSTRUCTION OF LEACHATE CONTROL MEASURES					
3.2.3.1	Deep subsoil leachate interception and blanket drains must be constructed on and around the Site according to the Report 1.1(a) with an LDPE membrane of at least 2mm thickness at the base and downstream face of the drains to effectively intercept all sub-surface leachate generated on Site.	Y	√			Note that during the rehabilitation, the leachate dam at the toe of the site was removed and the leachate is discharged directly to the sewer with permission of the authorities.
3.2.3.2	Surface leachate interception drains must be constructed on and around then Site in accordance with the Reports with an LDPE membrane at the base and downstream face of the drains to effectively intercept and drain all leachate generated on the surface of the Site.	Y	√			
3.2.3.3	Surface leachate interception drains constructed in compliance with condition 3.2.3.2 and leachate holding works constructed to hold leachate must be of such a capacity as to maintain a freeboard of half a metre and to hold at least two weeks of leachate while accommodating all stormwater runoff, 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 fifty years; and all expected leachate, as referred to in condition 5.2.2.	Y	√			
3.2.4	CONSTRUCTION OF LANDFILL GAS CONTROL MEASURES					
3.2.4.1	Based on the outcome of the monitoring conducted according to the provisions of condition 8, the Permit Holder must implement adequate measures to the satisfaction of the Director, to:- a) Ventilate methane gas generated in the Site by constructing a gas ventilation system on the Site; b) Prevent build up of flammable gas; and c) Prevent lateral migration of methane gas.	Y	√			The amount of landfill gas generated by the site is very low: see below. This would be expected because only ash and other non-putrescible wastes have been disposed over the last 10 years.

Clause No.	Requirements	Permit Condition Applies (Y/N)	Compliance			Reasons
			Yes	Partial	No	
3.3	MAINTENANCE AND IMPACT MANAGEMENT DURING CLOSURE CONSTRUCTION					
3.3.1	ACCEPTANCE OF PERMISSIBLE FILL MATERIAL					
3.3.1.1	The disposal of permissible fill material on the Northern portion of the Site, as approved in terms of condition 2.1.2 must be aimed at achieving the final landform and must be done in accordance with:- a) Minimum Requirements b) The approved closure reports; c) The conditions of this permit; d) Any operational procedures or amendments of the closure reports submitted by the Permit Holder and approved by the Director; and e) Any other written direction issued by the Director.	Y	√			
3.3.1.2	The Permit Holder must keep a record of the following details for all loads of permissible fill material disposed of on Site and must report the details regarding the material disposed on Site according to condition 12.1:- a) Source of material; b) Volume of fill material in cubic metres; c) Physical properties of the fill material (e.g. % liquid, etc.); d) Chemical composition of the fill material; e) Concentration of all chemicals in the fill material; f) Primary classification of the waste according to SABS Code 0228; g) Secondary classification of the waste according to the Minimum Requirements; and h) Written approval from the Director to accept fill material from a particular source.	Y	√			No fill material had been disposed since the last audit.
3.3.2	GENERAL OPERATIONAL MEASURES					
3.3.2.1	Fill material and waste historically disposed of on Site may not be allowed to burn.	Y	√			
3.3.2.2	Fill material must be compacted and covered at the end of each working day with 1050mm of soil or other material approved by the Director.	Y	√			
3.3.2.3	Fill material and waste historically disposed of on Site may not be reclaimed.	Y	√			
3.3.2.4	The Permit Holder must make provision for adequate sanitation facilities on the Site while the Northern portion of the Site is being filled and for the duration of the construction operation.	Y	√			

Clause No.	Requirements	Permit Condition Applies (Y/N)	Compliance			Reasons
			Yes	Partial	No	
3.3.2.5	The permit holder must implement, maintain and at all times apply sufficient dust control measures, while the Northern portion of the Site is being filled and for the duration of the construction operation to prevent wind-blown dust from causing nuisance conditions or health hazards.	Y	√			
	The permit holder must implement, maintain and at all times apply sufficient odour control measures, while the Northern portion of the Site is being filled and for the duration of the construction operation to prevent odours from causing nuisance conditions or health hazards.	Y	√			
	The permit holder must implement, maintain and at all times apply sufficient noise control measures, while the Northern portion of the Site is being filled and for the duration of the construction operation to prevent noise from causing nuisance conditions or health hazards.	Y	√			
3.3.3	ACCESS CONTROL DURING ONGOING OPERATION AND CLOSURE CONSTRUCTION					
3.3.3.1	Weatherproof, durable and legible notices in at least two official languages applicable in the area, must be displayed at each entrance to the Site. These notices shall prohibit unauthorised entry and state the hours of construction for closure and fill activities, the name, address and telephone number of the Permit Holder and the person responsible for the construction closure of the Site.	Y	√			A new sign in both English and Zulu is available and was being erected at the time of the audit.
3.3.3.2	The Permit Holder must ensure the effective access control on the Site by having it fenced with a fence to a minimum height of 1.8 metres and by installing gates of a minimum height of 1.8m at all entrances, to reasonably prevent unauthorised entry domestic animals, game and unauthorised persons during the period of construction for closure.	Y	√			Access by residents of a new temporary residential area near the site is possible. EnviroServ have identified this risk and have taken steps to meet with the community to explain the risks involved and to get their cooperation: see text.
3.3.3.3	The Permit Holder must take all reasonable steps to maintain service roads in a condition that ensures unimpeded access to the Site for vehicles involved in the closure construction and transporting fill material and must keep these roads free of fill material and construction material.	Y	√			
3.3.3.4	The Permit Holder must ensure that all entrance gates are manned during the hours of closure construction and locked outside the hours of closure construction.	Y	√			The gates were manned at the time of the site visit but, as pointed out by the guard, no lock was available.

Clause No.	Requirements	Permit Condition Applies (Y/N)	Compliance			Reasons
			Yes	Partial	No	
3.3.3.5	Notices prohibiting unauthorised persons from entering the Site, as well as internationally accepted signs indicating the risks involved in unauthorised entry must be displayed at all potential access points to the Landfill Site.	Y	√			Amended 23 rd August 2007
3.3.4	OPERATING HOURS					
3.3.4.1	The disposal of permissible fill material may only take place during weekdays between 07h00 and 17h00 and on Saturdays from 07h00 to 13h00 and material deposited on the Northern portion of the Site must be compacted and covered before 18h00 on weekdays and before 14h00 on Saturdays.	N/A	#			The site is closed for the acceptance of waste
3.3.4.2	No machinery shall be in operation on the Site between 18h00 in the evening and 07h00 the next morning.	Y	√			
3.3.4.3	No filling or construction activities may take place on Sundays and Public Holidays.	Y	√			
4	LONG TERM MAINTENANCE AFTER CLOSURE OF THE SITE					
4.1	GENERAL MAINTENANCE AND IMPACT MANAGEMENT					
4.1.1	The Permit Holder must on a continuous basis, maintain all works constructed on the Site, or any portion thereof in accordance with the relevant minimum requirements; the conditions of this Permit and any other written instruction by the Director to the Permit Holder for a period of 30 years or for any longer period as may be determined by the Director.	Y	√			
4.1.2	The Permit Holder must implement, maintain and at all times apply sufficient control measures, to prevent odours from causing nuisance condition or health hazards.	Y	√			No odours were detected on site at the time of the audit.
4.1.3	The vegetative cover and vegetation established in terms of condition 3.2.1.3 must be maintained on a continuous basis.	Y	√			
4.1.4	The Site must be maintained in such a way that:- a) The formation of pools due to rain is prevented; b) Free surface runoff of rainwater is ensured; c) Contamination of stormwater is prevented; d) No objects or materials, which may hamper the rehabilitation of the Site are present; e) The build up and/or lateral migration of landfill gas is prevented; and f) Little or no erosion occurs.	Y	√			

Clause No.	Requirements	Permit Condition Applies (Y/N)	Compliance			Reasons
			Yes	Partial	No	
4.1.5	The Permit Holder must prevent access to the leachate collection facilities referred to in condition 3.2.3 by having it fenced with a fence to a minimum height of 1.8 metres and by installing gates of a minimum height of 1.8m at all entrance, to reasonably prevent entry of domestic animals, game and unauthorised persons until such time as it is no longer used for the collection of leachate.	N/A	#			The leachate dam has been removed and the leachate now discharges directly into the sewer on the southern side of the site. This condition is now not applicable and it is recommended that application be made to the Department for this and other conditions to be updated: see text.
5	STORMWATER AND LEACHATE MANAGEMENT					
5.1	RUNOFF MANAGEMENT					
5.1.1	All runoff water (stormwater) arising as a result of precipitation:- a) On land adjacent to the Site; and b) On the Site, Must be prevented from coming into contact with any substance, whether such substance is a solid, liquid, vapour or gas, or a combination thereof, which is produced, stored, dumped or spilled on the premises, including leachate and must be diverted and drained around the Site by means of works constructed by the Permit Holder in accordance with condition 3.2.2.	Y	√			
5.1.2	Runoff water (stormwater) referred to in condition 5.1.1, which complies with the quality requirements specified in Annexure I, or with such quality requirements as from time to time may be determined by the Director, will be regarded as uncontaminated runoff water and must be diverted and drained from the Site to the environment by means of stormwater diversion works constructed by the Permit Holder in accordance with condition 3.2.2.1.	Y	√			
5.1.3	Uncontaminated runoff water must under no circumstances be used to dilute waste water resulting from any activities on the Site or leachate emanating from the Site, but must be dealt with according to condition 5.1.2.	Y	√			
5.1.4	Runoff water referred to in condition 5.1.1, which does not comply with the quality requirements as may for time to time be determined by the Director, will be regarded as contaminated runoff water and must be dealt with according to conditions 5.1.5 and 5.2.2.	Y	√			

Clause No.	Requirements	Permit Condition Applies (Y/N)	Compliance			Reasons
			Yes	Partial	No	
5.1.5	All contaminated runoff water as defined in condition 5.1.4 may not be discharged to the environment but must be diverted by means of containment works constructed in accordance with condition 3.2.2.2.	Y	√			
5.2	LEACHATE MANAGEMENT	Y	√			
5.2.1	All leachate produced on Site must be intercepted by means of subsoil and surface leachate interception drains constructed according to conditions 3.2.3.1 and 3.2.3.2.	Y	√			
5.2.2	All leachate in the subsoil interception leachate drains must be diverted to a leachate collection and holding works with sufficient capacity to maintain all stormwater runoff under the estimated maximum precipitation conditions in accordance with condition 3.2.3.3.	N/A	#			The leachate discharges directly to the sewer and, therefore, this condition is no longer applicable: see text.
5.2.3	All leachate collected in terms of condition 5.2.1, as well as contaminated runoff water collected in terms of condition 5.1.5, must be transported by tanker to the sewage purification works, provided written proof has been supplied to the Director that the authority in control of that works will accept such leachate and bear responsibility for the impact that it may have on the operation of this sewage purification works.	N/A	#			This condition is no longer applicable: see text.
5.2.4	The Permit Holder must ensure that the contaminated stormwater containment works and the leachate collection works are emptied regularly according to condition 5.2.3 in order to ensure compliance with the freeboard requirements specified in condition 3.2.2.2.	N/A	√			This condition is no longer applicable: see text.
6	WATER QUALITY MONITORING					
6.1	GROUNDWATER QUALITY MONITORING NETWORK					
6.1.1	The groundwater quality monitoring network must consist of the boreholes numbered UM-10, UM-13, UM-14, BH 1S, BH 1D, BH2S, BH 2D, BH 3S, BH 3D, BH 4S, BH 4D and BH 5D, as approved by the Department of Water Affairs and Forestry.	Y	√			Amended 23 rd August 2007
6.1.2	This condition is no longer applicable to this permit.	N				
6.1.3	This condition is no longer applicable to this permit.	N				
6.1.4	This condition is no longer applicable to this permit.	N				
6.1.5	This condition is no longer applicable to this permit.	N				

Clause No.	Requirements	Permit Condition Applies (Y/N)	Compliance			Reasons
			Yes	Partial	No	
6.1.6	Groundwater quality monitoring of the network described in condition 6.1.1 must be conducted during each monitoring occasion in condition 6.3, starting in September 2001.	Y	√			The water quality data up to the 9 th January 2009 was provided to the auditor by Jones and Wagener plus a copy of the annual Water Quality Report dated July 2008.
6.1.7	The Permit Holder must maintain the groundwater quality monitoring network to the satisfaction of the Director, so that unobstructed sampling, as required in terms of this permit, can be undertaken.	Y	√			
6.1.8	Monitoring boreholes must be fitted with lockable caps. The Department reserves the right to take water samples at any time and to analyse these samples, or to have them taken and analysed.	Y	√			
6.2	SURFACE WATER QUALITY MONITORING NETWORK					
6.2.1	Background monitoring of the surface water quality must be conducted during each monitoring occasion in terms of condition 6.3 in the Isipingo River at the location numbered Um-Is_Up (Isipingo River: Upstream of Site), as indicated in the reports submitted by the Permit Holder, or at any other location which may be identified by the Director, which shall be upstream of the Site.	Y	√			See comment under condition 6.1.6.
6.2.2	Monitoring of the impact of the Site on the surface water quality must be conducted: a) In the Isipingo River downstream from the Site at the monitoring point numbered Um-Is_Dn; or b) At any other location which may be identified by the Director, which shall be upstream of the Site.	Y	√			
6.2.3	Monitoring of stormwater and leachate quality must be conducted during each monitoring occasion in terms of condition 6.3 at monitoring points numbered Um-St_Dr and Um-Lch at any other location which may be identified by the Director.	Y	√			
6.3	FREQUENCY OF WATERN QUALITY MONITORING AND VARIABLES FOR ANALYSIS					
6.3.1	Monitoring of the groundwater quality must be conducted at the locations specified in 6.1.1 at the following intervals: a) Biannually for the rest levels of the water in the monitoring boreholes; b) Biannually for in April and October for the variables listed in Annex II; c) Annually for determinants in Annexure III.	Y		√		Amended 23 rd August 2007

Clause No.	Requirements	Permit Condition Applies (Y/N)	Compliance			Reasons
			Yes	Partial	No	
6.3.2	Monitoring of the surface water quality must be conducted at the locations specified in 6.2.1 and 6.2.2 at the following intervals: a) Biannually during the months of April and October for the variables listed in Annexure II; and b) Annually for determinants in Annexure III.	Y	√			Amended 23 rd August 2007
6.3.3	Monitoring of the uncontaminated runoff water must be conducted for the variables specified in Annexure 1 during each monitoring occasion:- a) In all stormwater drains and containment works on an adjacent to the Site: and b) In the unnamed tributary of the Isipingo River in the valley downstream from the point where uncontaminated runoff water is being discharged.	Y	√			Complies
6.3.4	Any leachate which may be produced on Site or contaminated runoff water must be monitored: a) Biannually during the months of April and October for the variables listed in Annexure II; and b) Annually for determinants in Annexure III.	Y	√			Amended 23 rd August 2007
6.3.5	Monitoring of treated leachate and/or contaminated runoff water that are discharged into the environment must be conducted annually for any other variables which are not covered by Annexure II and Annexure III, but which are listed in Government Notice 991, referred to in condition 5.2.3, at the locations specified in condition 6.2.3.	Y	√			
6.4	INVESTIGATIVE WATER QUALITY MONITORING					
6.4.1	If, in the opinion of the Director, a water quality variable listed at any monitoring point shows an increasing trend, the Permit Holder must initiate a monthly monitoring programme for the water quality variables listed in both Annexure II and Annexure III at those monitoring points specified by the Director.	Y	√			The water quality is such that the auditor considers that no investigative water quality monitoring is currently required.
6.5	POST CLOSURE WATER QUALITY MONITORING					
6.5.1	Water quality monitoring in accordance with conditions 6.1, 6.2, 6.3 and 6.4, must continue after closure of the Site and must be maintained for a period of 30 years, or such period and/or frequency and/or locations, as may be determined by the Director.	Y	√			

Clause No.	Requirements	Permit Condition Applies (Y/N)	Compliance			Reasons
			Yes	Partial	No	
7	AIR QUALITY AND GAS MONITORING					
7.1	MONITORING OF LANDFILL GAS					
7.1.1	Monitoring of flammable gas must be conducted:- a) Through a network of boreholes indicated by the coordinates in the plan numbered Job 7207 submitted by the Permit Holder on 10 January 2000 or any other monitoring devices approved by the Director, which must be 1 metre deeper than the deepest point in the waste body; and b) In the atmosphere inside the buildings on-site, For the quantitative detection of the following volatile materials on the Site:- i) Carbon dioxide; ii) Methane; iii) Total volatile organic carbons; and iv) Benzene.	Y	√			Low concentrations of methane and carbon dioxide gas were observed from probe 8 on the 6 th January 2009. The flow rate was, however, extremely low and was recorded by Margo Saner and Associates as "0". No measurements are taken in buildings on-site. There is only a guard hut and a toilet.
7.1.2	This network must be established within 60 days from the date of this Permit for the quarterly measurement of variables required in terms of condition 7.1.1.	Y	√			Established. Note that this condition is essentially redundant.
7.1.3	The atmospheric levels in the atmosphere of:- a) Carbon dioxide must not exceed 0.5%; and b) Methane must not exceed 1%, By volume at the monitoring locations specified in condition 7.2.1.	Y	√			The methane concentrations and the carbon dioxide levels were exceeded in probe 8 in the sampling period to 9 th January 2009 but the flow rate is so low that it does not represent any risk to human health and the environment.
7.1.4	Should the levels of flammable gas be between 0.1% and 1%, a higher frequency of monitoring must be instituted? Should levels above 1% be detected in buildings on the Site, the buildings must be evacuated and the contingency plan submitted in terms of condition 13.4.1 must be implemented immediately.	Y	√			
7.1.5	Should the measurements of the gas monitoring network at any time exceed the limits specified in condition 7.1.3, the permit holder must report this as an incident according to condition 13.1.	Y	√			

Clause No.	Requirements	Permit Condition Applies (Y/N)	Compliance			Reasons
			Yes	Partial	No	
7.2	AIR QUALITY, LANDFILL GAS AND DUST MONITORING PROGRAMME					
7.2.1	The Permit Holder must within 60 days from the date of this Permit, submit a proposal for a comprehensive air quality and dust monitoring program to the Department for approval by the Director, which must address the following: a) A monitoring procedure for the Site; b) Monitoring of flammable gas according to condition 7.1; c) On and off-site monitoring of additional air quality variables not described in condition 7.1, including dust; and d) Post-closure monitoring.	Y			√	On-site and off-site air quality measurements are not being done and are not considered necessary by the auditor, because of the very low risk posed by the site, particularly now that the site is closed. This condition should be removed from the permit or otherwise qualified: see text.
7.2.2	An air quality and dust monitoring network for the site must be implemented according to the air quality monitoring program referred to in condition 7.2.1, within 60 days from the date on which the Director approved it and maintenance of this network must be to the satisfaction of the Director.	Y			√	No dust monitoring programme is in place and is probably not necessary now that the site is closed: see text.
7.2.3	Until such time as the report referred to in 7.2.1 is implemented, an interim air quality and dust monitoring program must be implemented with immediate effect.	Y	√			
7.3	POST- CLOSURE AIR QUALITY AND GAS MONITORING					
7.3.1	Air quality and gas monitoring, as described as described in conditions 7.1 and 7.2 must continue after closure of the Site until the landfill gas peak concentration of methane and carbon dioxide has been detected, or for any longer period, as may be determined by the Director.	Y	√			
8	FURTHER INVESTIGATIONS					
8.1	If in the opinion of the Director, groundwater, surface water and/or air pollution have occurred or may possibly occur, the Permit Holder must conduct, and/or appoint specialists to conduct the necessary investigation and implement additional monitoring and rehabilitation measures to the satisfaction of the Director.	Y	√			

Clause No.	Requirements	Permit Condition Applies (Y/N)	Compliance			Reasons
			Yes	Partial	No	
9	AUDITS AND INSPECTIONS					
9.1.1	The Permit Holder must conduct monthly inspections of the Site, during which the following must be inspected and maintained where necessary: a) Integrity of the stormwater and leachate systems b) Occurrence of erosion on the capped surface; c) Integrity of vegetation established as part of the closure construction; d) Level of leachate in the leachate detection sump; e) Odours; and f) Fencing.	Y	√			Monthly inspections are being carried out by Mr Paul Shult, the site supervisor, and any maintenance that is required is carried out by EnviroServ Tailings
9.1.2	The Permit Holder must conduct quarterly audits on the Site and must compile an official audit report on each audit occasion documenting the findings of the audit according to condition 13.2, which must be submitted to the external auditor and the Department according to condition 13.3.	Y	√			Quarterly audits for the months of were made available to the auditor January and April 2009.
9.2	EXTERNAL AUDITS					
9.2.1	The Permit Holder must appoint an independent external auditor to audit the Site annually, and this auditor must compile an audit report documenting the findings of his audit, which must be submitted by the Permit Holder according to condition 13.3.	Y	√			This audit fulfils this permit condition.
9.3	DEPARTMENTAL AUDITS AND INSPECTIONS					
9.3.1	The Department reserves the right to audit and/or inspect the Site at any time and at such a frequency as the Director may decide, or to have the Site audited or inspected.	Y	√			
9.3.2	The Permit Holder must make any records or documentation available to the Director upon request, as well as any other information the Director may require.	Y	√			
9.3.3	The findings of these Departmental audits or inspections shall be made available to the Permit Holder and the Monitoring Committee within 60 days of the end of the audit or inspection and shall not be treated as confidential.	Y	√			

Clause No.	Requirements	Permit Condition Applies (Y/N)	Compliance			Reasons
			Yes	Partial	No	
10	MONITORING COMMITTEE					
10.1	The Permit Holder must take all reasonable steps to maintain and ensure the continued functioning of the Umlazi IV Landfill Site Closure and Rehabilitation Monitoring Committee (herein after referred to as the "Monitoring Committee") during the period of closure construction on the Site and for a period of at least two years after the closure of the Site was confirmed in terms of condition 3.1.5, or such a longer period as may be determined by the Director.	Y	√			There is a functioning committee.
10.2	The Monitoring Committee <u>shall</u> be representative of relevant interested and affected persons and may consist of at least the following parties: (a) Permit Holder and/or his appointed consultant(s) or advisor(s); (b) Representative(s) of the Health, Environment and/or Waste Departments of the relevant local authority(ies); (c) Representative(s) of this Department; (d) Representative(s) of the Provincial Government responsible for waste management and environmental matters; and (e) At least 3 (three) persons/parties from the local community and/or their representatives elected by the local residents and/or their consultant(s) or advisor(s).	Y	√			
10.3	The Monitoring Committee shall meet at least once every four months and not later than 30 days after the external audit report specified in condition 9.2 has been submitted according to condition 13.3.2.	Y	√			
10.4	The Permit Holder must ensure that minutes of all meetings of the Monitoring Committee are kept and must ensure the distribution of these minutes to all members of the Monitoring Committee within 14 days after a meeting.	Y	√			
11	ANALYSIS OF SAMPLES					
11.1	The Permit Holder must ensure that all samples taken in accordance with conditions 6, 7 and 8 are:- a) Analysed by a laboratory accredited by the South African Bureau of Standards, referred to in the Standards Act, 1982 (Act 30 of 1982); and b) According to methods prescribed in terms of Government Notice 991 of 18 May 1984, or another method of analysis for which approval had been obtained from the Director.	Y	√			

Clause No.	Requirements	Permit Condition Applies (Y/N)	Compliance			Reasons
			Yes	Partial	No	
12	RECORDING					
12.1	The Permit Holder must keep records and update all information referred to in Appendix IV on an annual basis during the period of closure construction.	Y	√			
12.2	The Permit Holder must keep records and update all information referred to in Appendix V on an annual basis after the period of closure construction.	Y	√			
12.3	The Permit Holder must keep records of all water monitoring data resulting from chemical analyses done in accordance with conditions 6 and 11 in the format depicted in Annexure VI, as well as from air quality and gas monitoring conducted in accordance with condition 7.	Y	√			
13	REPORTING					
13.1	REPORTING OF INCIDENTS					
13.1.1	The permit holder must within 24 hours, notify the Director of the occurrence or detection of any incident at the site or incidental to the operation of the site which has the potential to cause or has caused water pollution of the environment, health risks or nuisance condition or which is a contravention of any permit condition.	Y	√			
13.1.2	The permit holder must within 14 days or shorter period of time if specified by the Director, from the occurrence or detection of any incident referred to in condition 13.1.1 submit an action plan, which shall include a detailed time schedule to the satisfaction of the Director of measures taken to: a) Correct the impact resulting from the incident b) Prevent the incident from causing any further impacts; and c) Prevent recurrence of a similar incident	Y	√			
13.1.3	In the event that measures have not been implemented within 21 days to address the impacts caused by any incident referred to in condition 13.1.1, or measures which have been implemented are inadequate, the Department may implement the necessary measures at the cost and risk of the permit holder.	Y	√			
13.1.4	The permit holder must keep an incident report and complaints register, which must be made available to both external and Departmental auditors for the purpose of their audits.	Y	√			

Clause No.	Requirements	Permit Condition Applies (Y/N)	Compliance			Reasons
			Yes	Partial	No	
13.2	AUDIT REPORTS					
13.2.1	All audit reports must specifically state whether the conditions of this Permit are adhered to and must include an interpretation of all available data and test results regarding the operation of the Site and all its impact on the environment.	Y	√			
13.2.2	All audit reports must contain recommendations regarding non-compliance or potential non-compliance and must specify target dates for the implementation of the recommendations by the Permit Holder.	Y	√			
13.2.3	Baseline monitoring results must be included in all audit reports and must be reported for each sampling occasion.	Y	√			
13.3	SUBMISSION OF REPORTS					
13.3.1	All internal audit reports referred to in condition 9.1.1 must be made available to the external auditor referred to in condition 9.2.1, and the Department according to condition 9.2.1.	Y	√			
13.3.2	Each external audit report referred to in condition 9.2 must be sent to the Director and the monitoring Committee within 30 days from the date on which the external auditor finalised the audit.	Y	√			
13.3.3	The information required in terms of condition 12.1, where applicable, must be submitted to the Director and the Monitoring Committee within 30 days from the date on which the external auditor finalised the audit.	Y	√			
13.3.4	The information required in terms of conditions 6, 7 and 8, must be submitted to the Director in the format specified in condition 12.3, where applicable, within a period of 30 days following analysis of the samples. The information must also be included in a trend report, which must contain a graphical presentation of the results obtained previously at any specific sampling point, as well as an interpretation and discussion of the results of each monitoring occasion.	Y	√			
13.4	OTHER REPORTS					
13.4.1	The Permit Holder must prepare an emergency contingency plan to be followed when:- a) Measured levels of flammable gas reaches the levels as referred to in condition 7.1.3. b) The Site or any portion, thereof is on fire; or c) The potential for slippage or explosion exists, And this plan must be submitted to the Director within four (4) months from the date of this Permit.	Y	√			

Clause No.	Requirements	Permit Condition Applies (Y/N)	Compliance			Reasons
			Yes	Partial	No	
13.4.2	The Permit Holder must submit a written report to the Director regarding any deviations from plans and/or operation procedures described in this permit and must obtain written permission from the Director before such deviations may be implemented.	Y	√			
14	LEASING AND ALIENATION OF THE SITE					
14.1	Should the Permit Holder want to alienate or lease the site, he shall notify the Director in writing of such an intention at least 90 days prior to the said transaction.	Y	√			
15	GENERAL					
15.1	This Permit is not transferable	Y	√			
15.2	This Permit must not be construed as exempting the Permit Holder from compliance with the provisions of the Health Act, 1977 (Act 63 of 1977), the National Water Act, 1998 (Act 36 of 1998), the Occupational Health and Safety Act, 1993 (Act 85 of 1993) or any other applicable act, ordinance, regulation or by-law.	Y	√			
15.3	The Permit Holder must within a period of 60 days from the date of issuing of this permit apply for rezoning of the Site to be used for recreational activities.	Y	√			
15.4	Should the Permit Holder be unsuccessful in rehabilitating the Site to meet the conditions of 2.2.3 within 2 years from the date of issuing this permit, a written motivation must be provided to the Director defining the reasons why it failed. The Director shall then take a decision regarding the future of the Site.	Y	√			
15.5	The Permit Holder must within a period of 120 days from the date of issuing of this Permit amend the title deed of the property to permanently place a building restriction on the Site.	Y	√			

Appendix 2: Completed Environmental Management Audit Form

UMLAZI LANDFILL SITE, KWAZULU-NATAL

EXTERNAL AUDIT: ENVIRONMENTAL MANAGEMENT

LEAD AUDITOR: Dr D A Baldwin: Environmental And Chemical Consultants cc, P O Box 2856, Cresta, 2118

DATES: 29th April 2009

OTHER EXTERNAL AUDITORS: None

CONDITION	QUESTION	RESPONSE	ADEQUATE	REMARKS
1. POLICY AND STRATEGY				
1.1	Is there a company environmental policy?	Yes	Yes	
1.2	Is the policy approved and supported by executive management?	Yes	Yes	
1.3	Are strategic goals and objectives spelled out in the policy?	Yes	Yes	
1.4	Are the goals and objectives comprehensive enough	Yes	Yes	
1.5	Is there an appropriate strategy to ensure implementation of the policy, e.g. ISO 14000, Responsible Care?	Yes	Yes	The Site has an accredited ISO 14001 system.
1.6	Does the policy comply with that of the government?	Yes	Yes	
1.7	Are the policy and strategy and the compliance requirements sufficient to meet requirements of Hh site?	Yes	Yes	
1.8	Do the site managers receive the active support of other staff to implement the strategy?	Yes	Yes	
2. ORGANISATION				
2.1	Is there an organisation plan available?	Yes	Yes	
2.2	Is the plan appropriate for the management tasks to be accomplished?	Yes	Yes	
2.3	Have responsibilities, accountabilities and authority been assigned?	Yes	Yes	
2.4	Who is responsible for and are they suitably qualified for: a) Strategic function? b) Air quality management? c) Water quality management? d) Waste treatment? e) Waste disposal?	C Kidd C Kidd C Kidd A Bowles C Kidd	Yes	

CONDITION	QUESTION	RESPONSE	ADEQUATE	REMARKS
	f) Landfill equipment? g) Laboratory? h) Vehicle control?	C Kidd A Bowles C Kidd		
2.5	Are job descriptions available for the employees concerned?	Yes	Yes	
3. RESOURCES				
3.1	Is there adequate manpower to accomplish all the management tasks on site?	Yes	Yes	
3.2	Is there a separate budget for environmental management expenditures?	Yes	Yes	
3.3	Are there adequate allocations for: a) Capital? b) Manpower? c) Running costs? d) Contracts? e) Other Expenses?	Yes	Yes	
4. LEGAL REQUIREMENTS AND COMPANY STANDARDS				
4.1	Is there a paper or electronic file containing a complete set of legal requirements? a) Relevant acts b) DWAF permits c) Consent use permits d) Other	Yes	Yes	All environmental legislation pertinent to waste disposal is readily available electronically, via the Company's Intranet. This legislation is kept updated by a contracted Legal Service Provider.
4.2	How is the file kept current?	Legal Update Service	Yes	
4.3	Are there company guidelines for environmental performance?	Yes	Yes	
4.4	Are all staff members who have to contribute to environmental performance aware of the landfills/companies expectations?	Yes	Yes	
4.5	Does the site comply with all legal requirements and company standards?	See Compliance Audit		
5. SITE AND PLANT DESIGN				
5.1	SITE	See Compliance Audit		
5.2	BOREHOLE SYSTEM:	See Compliance Audit		
5.3	LEACHATE MANAGEMENT:	See Compliance Audit		
5.4	LANDFILL GAS MANAGEMENT	See Compliance Audit		

CONDITION	QUESTION	RESPONSE	ADEQUATE	REMARKS
5.5	WASTE TREATMENT PLANT			
5.5.1	1. Is there a waste treatment plant at the site?	No	Yes	
5.5.2	2. If yes, is the design adequate to treat the wastes for which it is designed?	N/A		
5.5.3	3. If no, are there plans to install a plant?	No	Yes	
5.5.4	4. Are wastes treated on site	Yes	Yes	
5.5.5	5. Which treatment procedures are used? a) Neutralisation with lime b) Ferrous sulphate reduction c) Oxidation: chlorine H ₂ O ₂ d) Sodium sulphide e) Ash blending	No No No No No	Yes Yes Yes Yes Yes	
5.5.6	6. Are the chemical and waste storage facilities adequate?	Yes	Yes	
5.6	LABORATORY			
5.6.1	1. Is there a laboratory on site?	No	Yes	The laboratory is located at the Shongweni Landfill
5.6.2	2. Is its layout and design adequate?	Yes	Yes	
6. OPERATIONS AND PRACTICES				
6.1	GENERAL			
6.1.1	Is there a designated responsible person?	Yes	Yes	C Kidd
6.1.2	Are there operational procedures in place for all operations on site particularly those dealing with: a) Air quality management? b) Water quality management? c) Site management? d) Occupational health management?	Yes Yes Yes Yes	Yes Yes Yes Yes	See text.
6.1.3	Have all operators been trained sufficiently in applying the procedures to ensure compliance.	Yes	Yes	
6.1.4	Do the operators comply with the procedural requirements?	Yes	Yes	
6.2	SITE OPERATIONS			
6.2.1	Aesthetics: a) Fenced and in good condition? b) Entrance Clean? c) Offices and guard hut adequate? d) Change rooms and ablutions clean?	Yes Yes Yes Yes	Yes Yes Yes Yes	

CONDITION	QUESTION	RESPONSE	ADEQUATE	REMARKS
6.2.2	Are there adequate waste records?	See Compliance Audit		
6.2.3	Access, is there: a) Adequate visitor control?	Yes	Yes	
	b) Adequate fencing, lighting and signage?	See Compliance Audit		
6.2.4	Is there landfill equipment on site:			The site is not accepting waste and has been rehabilitated.
	a) Landfill compactors?	No	Yes	
	b) Bulldozers?	No	Yes	
	c) FELs?	No	Yes	
	d) Trucks?	No	Yes	
	e) Scrapers?	No	Yes	
	f) Water bowser?	No	Yes	
g) Pumps?	Yes	Yes		
6.2.5	Are there adequate personnel on site?			
	a) Spotters?	None	Yes	
	b) Drivers?	None	Yes	
	c) General workers?	Yes	Yes	
	d) Supervisors?	None	Yes	
e) Managers?	Yes	Yes		
6.2.6	Is there adequate:			
	a) Cover material?	Yes	Yes	
	b) Ash?	None	Yes	
	c) Lime?	None	Yes	
d) Other chemicals?	None	Yes		
6.2.7	Is the waste:	Not Applicable		
	a) Compacted adequately?			
	b) Covered daily?			
	c) Being deposited according to plan?			
	d) Working face adequate?			
	e) Co-disposal adequate?			
	f) Treated as required?			
	g) Capable of disposal to wet weather cell?			
h) Disposed in adequate trenches?				
6.2.8	Are the problem loads managed adequately?	Not Applicable		
	a) medical waste			
	b) hazardous waste			
c) special/safe disposal loads				

CONDITION	QUESTION	RESPONSE	ADEQUATE	REMARKS
	d) tyres e) potentially radioactive loads			
6.2.9	Storm water control:	See Compliance Audit		
6.2.10	Leachate control:	See Compliance Audit		
6.2.11	Nuisance factors controlled adequately: a) Noise b) Dust c) Flies d) Litter e) Odours	Yes Yes Yes Yes Yes	Yes Yes Yes Yes Yes	
6.2.12	Is the site audited and are there adequate records?	See Compliance Audit		
6.3	MONITORING PROGRAMMES			
6.3.1	Weather monitoring and data are available for: a) Rainfall b) Wind speed and direction c) Evaporation	Yes Yes Yes	Yes Yes Yes	
	d) Surface water quality e) Ground water quality f) Leachate quality g) Landfill gas h) Air quality (odour) i) Do the monitoring programmes indicate any pollution from the site?	See Compliance Audit		
6.4	OCCUPATIONAL HEALTH AND SAFETY			
6.4.1	Is an audit report available from a registered professional?	Yes	Yes	
6.4.2	Is the personal protective equipment adequate?	Yes	Yes	
6.4.3	Is the PPE used properly?	Yes	Yes	
6.4.4	Is training given to staff and it is adequate?	Yes	Yes	
6.4.5	Is there regular training in health and safety?	Yes	Yes	
6.4.6	Are there trained first aiders and/or nursing sister on site?	Yes	Yes	
6.4.7	Are there adequate records of incidents/accidents?	Yes	Yes	
6.4.8	Emergency plan in place?	Yes	Yes	
6.4.9	Fire equipment adequate, checked regularly and readily available?	Yes	Yes	
6.4.10	A staff programme of medicals based on type of job in place?	Yes	Yes	

CONDITION	QUESTION	RESPONSE	ADEQUATE	REMARKS
6.4.11	Are all contractors required to obey a site SHE policy?	Yes	Yes	
6.5	LABORATORY			
6.5.1	Is the laboratory clean and tidy?	Yes	Yes	
6.5.2	Are the procedures used clearly defined and readily available?	Yes	Yes	
6.5.3	Is all equipment required available?	Yes	Yes	
6.5.4	Are the laboratory records adequate?	Yes	Yes	
6.5.5	Are the monitoring methods designed to comply with the environmental legal and other requirements?	Yes	Yes	
6.5.6	Are the monitoring samples analysed by the company or under contract for: a) Air quality? b) Water quality: surface and ground? c) Waste? d) Land/soil?	None Contract Company Contract	No Yes Yes Yes	No contract in place for air quality monitoring.
6.5.7	Is all the on-site (or the contractor's) testing equipment regularly calibrated?	Yes	Yes	
6.5.8	How is the accuracy of measurement and results ensured?	Regular calibration and testing of equipment	Yes	
6.5.9	Do the methods of analysis comply with legal requirements in the case of water quality standards?	Yes	Yes	
6.5.10	To whom are the results reported: a) Management? b) Authorities?	Yes Yes	Yes Yes	
7. MAINTENANCE				
7.1	Is the maintenance policy and strategy focused on prevention or curative measures?	Prevention	Yes	
7.2	Is there a regular maintenance programme for all equipment on site?	Yes	Yes	
7.3	Have all technical staff members responsible for maintenance been trained adequately to ensure effective maintenance?	Yes	Yes	
7.4	Do technicians comply with environmental maintenance requirements?	Yes	Yes	

CONDITION	QUESTION	RESPONSE	ADEQUATE	REMARKS
8. CONTINGENCY MEASURES				
8.1	Are there plans in place to cope with emergencies and contingencies in: <ul style="list-style-type: none"> • Air quality management? • Water quality management? <ul style="list-style-type: none"> Surface? Ground? • Waste management? • Land (site) management? 	Yes Yes Yes Yes Yes	Yes Yes Yes Yes Yes	
8.2	Have the staff members who have the responsibilities for contingencies been appropriately trained?	Yes	Yes	
8.3	Do these staff members regularly exercise the contingencies and procedures related thereto?	Yes	Yes	
8.4	4. Do you report emergencies to: <ul style="list-style-type: none"> • Management? • authorities <ul style="list-style-type: none"> - Air? - Water? • Neighbours? 	Yes No Yes Yes	Yes Yes Yes Yes	
8.5	Do employees responsible for handling emergencies/ contingencies know the correct reporting procedures?	Yes	Yes	
8.6	Do employees dealing with contingencies have appropriate authority to cope?	Yes	Yes	
9. INCIDENT REPORTING AND REMEDY				
9.1	Do employees handling contingencies report to the correct authorities in compliance with legal requirements?	See Compliance Audit		
9.2	Are written records kept to track progress with corrective actions or to record the results of measures instituted during contingencies?	Yes	Yes	
9.3	Is the experience gained in handling contingencies for operational improvements and/or training purposes?	Yes	Yes	
9.4	Any contingencies during the past year?	None	Yes	
10. ENVIRONMENTAL MANAGEMENT TRAINING & AWARENESS				
10.1	Are the personnel sufficiently environmentally aware:			

CONDITION	QUESTION	RESPONSE	ADEQUATE	REMARKS
	<ul style="list-style-type: none"> • Horizontally? • Vertically? 	Yes Yes	Yes Yes	
10.2	Do you have environmental awareness training programmes presented? <ul style="list-style-type: none"> • Internally? • Externally? 	Yes Yes	Yes Yes	
10.3	Is environmental management training appreciated and supported by executive management?	Yes	Yes	
10.4	Do you have programmes for formal in-house or university/technikon environmental management training?	External	Yes	
11. CONTRACTOR SELECTION AND PERFORMANCE				
11.1	Do you make use of outside contractors in environmental management in your company?	Yes	Yes	
11.2	Do you as a rule require of contractors to comply with environmental legal and company performance standards?	Yes	Yes	
11.3	Do you monitor the environmental performance of contractors?	Yes	Yes	
11.4	Do you keep records of contract performance?	Yes	Yes	
11.5	Do you take any form of action if contractors do not perform to the required standards or contractual agreements?	Yes	Yes	
12. COMMUNICATION				
12.1	Is there a complaints register and Monitoring Committee?	See Compliance Audit		