

From 50 Dump Sites to 50 Waste Disposal Facilities – Challenges and Lessons Learnt

R.A. Pienaar. Associate Engineer, AECOM South Africa. reon.pienaar@aecom.com

M. Howard. Executive Technical Manager, AECOM South Africa. mike.howard@aecom.com

ABSTRACT

Waste generation and therefore waste management and waste disposal sites is something that is synonymous with all towns in South Africa. A large number of disposal sites in South Africa are operating illegally and without a license. The Department of Environmental Affairs (DEA) undertook to begin the process of licencing the sites with a target that all would be licensed by 2013/2014. AECOM was appointment to undertake the licence application process for 50 unlicensed communal landfill sites in the Western Cape, in December 2013. 50 Basic Assessment reports had to be submitted before the end of March 2014. The sites were spread over a large area covering most of the Western Cape Province and logistical, weather, consultation and communication challenges were experienced. The final reports recommended rehabilitation methods to ensure that the sites operate or close in a manner that will minimise any negative impact on the surrounding environment.

1. INTRODUCTION

1.1 Project Background

Waste generation and therefore waste management and waste disposal sites are something that is synonymous with all towns in South Africa. Every town, regardless of how small, needs some sort of waste management system and it is a reality that most of the small town disposal sites in South Africa are very poorly managed and maintained. A large number are illegally operated and unlicensed.

The Department of Environmental affairs (DEA) commissioned a study in 2007, completed in 2009 that aimed at identifying and determining the number of waste disposal facilities in South Africa that are not licenced. Of a total of 581 sites that were identified, 431 needed to be licensed. It was evident from the study that municipalities did not have adequate training or funding for lodging applications to licence their unlicensed waste disposal facilities or the management thereof. The Minister undertook to begin the process of licencing these sites, with a target that all would be licenced by 2013/2014. By 2012, a backlog of 122 municipal waste disposal facilities that still needed to be licenced by the end of 2013/2014 were identified. A number of consulting companies were appointed to undertake the licencing processes. AECOM was appointed in December 2013 by the DEA to prepare the license applications for 50 unlicensed communal landfill sites in the Western Cape Province.

1.2 The Licensing Process and Timeframe

The waste licensing process requires the preparation of a Basic Assessment Report (BAR) (according to the Environmental Impact Assessment Regulations made under section 24(5) of the National Environmental Act, 1998, Act No.107 of 1998 (NEMA)) and public consultation on the licensing process. The DEA target was to have the license applications for these sites in before the end of March 2014.

The time frame to complete the basic assessment process for the licence application and for the license to be granted is typically 6 months or more. With the co-operation of the relevant authorities, the 50 separate BARs and licence applications were completed and submitted on 1 April 2014.

1.3 Site locations

The sites were spread out over a large area covering most of the Western Cape Province as can be seen in Figure 1.

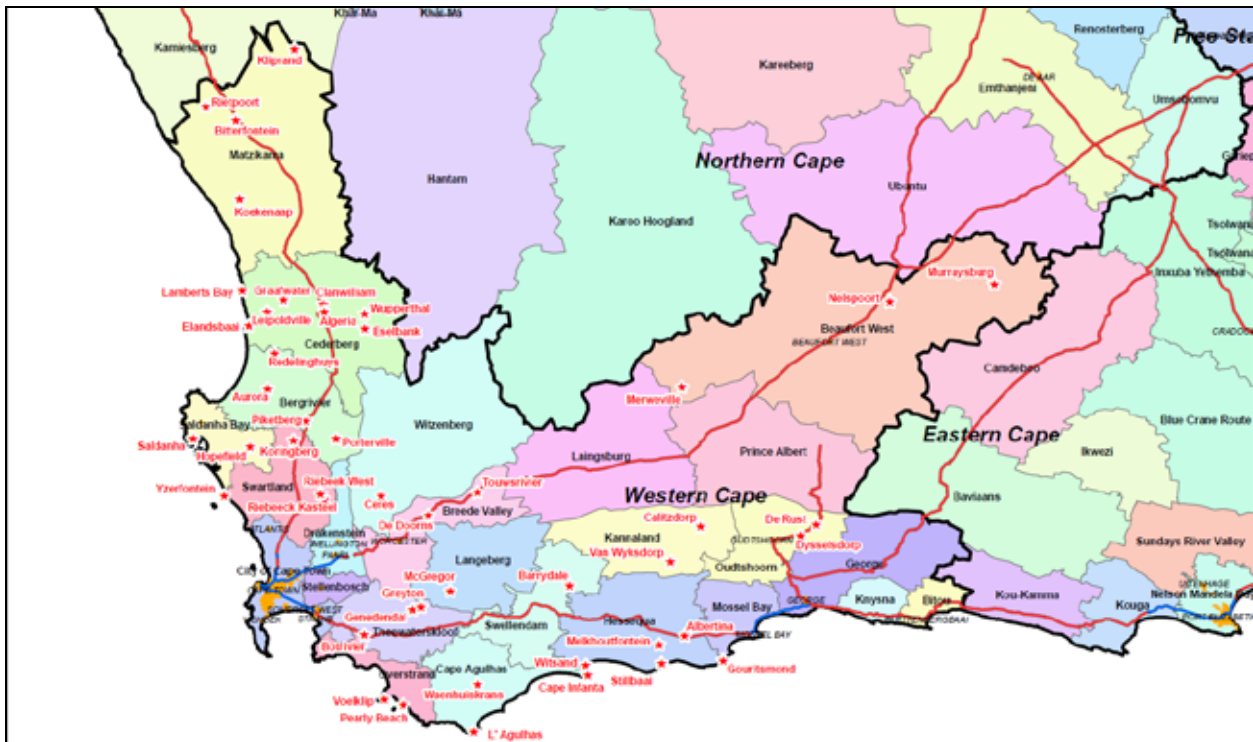


Figure 1: Site location

1.4 Site Classifications

The new (2013) Waste Classification and Management Regulations gives very little guidance towards closure and rehabilitation of landfill sites since it is focussed on the classification and disposal of waste. It was thus important to follow the guidelines published in the 1998 DWAF Minimum Requirements for Waste Disposal by Landfill, 2nd Edition. All the sites for this study were classified as GCB (Communal) sites, receiving less than 25 tons of waste per day.

2. METHODOLOGY

2.1 Time frame

The contract between DEA and AECOM was signed on the 3rd of January 2014 after which the preparation for the application forms started. These forms had to be completed by the 12th of January 2014, leaving the project team 9 days to complete 50 application forms. To accomplish this, a bespoke database system was developed by one of the team members, which meant that various parts of the database could be completed by different team members. The database populated a template which meant any changes that needed to be made only resulted in a minor change to the database. Much of the information in the database was also used in preparing the Basic Assessment reports, which saved time.

The short time frame that was allowed for this project required the full time attention of most of the AECOM Environmental and Waste teams. In order to assist the project team with the work load, additional sub consultants were appointed. The project team was divided into smaller teams (5 teams), assigning 10 sites to every team.

In order to complete the basic assessment reports, site visits and a full public participation process were required. The adverts and the Background Information Documents (BID) were prepared and by the 20th of January the teams were ready to go to the sites. Site visits were made difficult by logistics, weather, consultation and communication with the municipalities, stakeholders, and the public and the availability of data. The sites each differed in size. Each of the project teams were responsible for visiting the 10 sites for inspections. During the first site visits, site photos, waste quantity estimations, site coordinates and site footprint sizes were recorded. Each team had 5 days available for the site visits.

The Western Cape Department of Environment, Agriculture and Development Planning (DEADP) were engaged in the process from the outset. One aspect that was not negotiable was the opportunity for the public to make inputs to the process. There were no shortening or reduction in timeframes and all regulated

processes needed to be followed. DEADP were extremely supportive during the entire process and the level of co-operation was outstanding. Additionally the degree of professionalism shown by the DEADP officials is an aspect that other provincial departments should learn from.

From a scheduling point of view, 22 days were allowed to prepare the draft BAR reports. The public were given 40 days to view the draft BAR reports and to submit their comments. Their comments were recorded on a database and feedback was provided. Subsequently the draft reports were finalised and resubmitted as final reports. The public were given another 21 days to review the reports.

The Final Basic Assessment Reports were submitted to the DEADP on 1 April 2014.

Each Basic Assessment Report contained site-specific information. This included co-ordinates of the site, site layout drawings, GIS maps of environmental and social sensitivities and impact assessments of each of the sites. No additional specialist studies were necessary as all these sites were regarded as degraded already. The most significant aspect that required careful consideration from an environmental perspective was the landfill sites' proximity to watercourses. The continued operation or closure of the site would play a large role in the significance of the impacts of the landfill site.

2.2 Environmental Management Programme (EMPr)

An Environmental Management Programme (EMPr) was drawn up for each site. The purpose of the EMPr was to prescribe management mechanisms or methods for the prevention of undue or reasonably avoidable adverse environmental impacts and for the enhancement of the positive environmental benefits of a development. The EMPr described measures that need to be undertaken to ensure the Duty of Care is bestowed upon those who cause, have caused or may in the future cause pollution or degradation of the environment, as per Section 28 (1) of the NEMA. Non-compliance to Section 28 (Duty of Care) is a criminal offence and may lead to criminal prosecution. The EMPr was developed to be used as a tool by the Municipalities that will guide and regulate environmental performance through all stages of development, including planning, design, construction, operation, closure, rehabilitation and post closure monitoring.

The EMPr was based on the following principles of the NEMA:

- to avoid, minimise or correct the disturbance of ecosystems and loss of biodiversity;
- to avoid or minimise or correct pollution and degradation of the environment;
- to avoid or minimise waste and to re-cycle waste where possible, disposing of it in a responsible manner;
- to apply a risk-averse and cautious approach; and
- to anticipate and to prevent negative impacts on the environment on people's environmental rights. Where they cannot be prevented, such impacts must be minimised and remedied.

The EMPr stipulated the legal requirements from the NEMA that the site must adhere to. The key functions in planning, implementing and monitoring was set out in the report for the Municipalities to ensure that the Site will be operating in an environmental sound manner.

2.3 Engineering Input

All the landfill sites were un-licensed and predated the Minimum Requirements for Waste Disposal by Landfill (DWAF 1998). Consequently the planning, engineering and operations at these sites were not according to the Regulations.

The engineering input on the management of the waste facilities was part of the EMPr report. The aim of the engineering input section was to provide operating procedures and guidelines to the municipalities in order to operate or close the landfill in accordance with the Regulations.

Waste quantity estimates and the current operational status of the landfill were recorded during the site visits. The sites were grouped into 3 major groups (Table 1) after the information gathering, for the purpose of the engineering input. Firstly there were the sites that were earmarked for closure and rehabilitation, then there were the sites earmarked for upgrading and converting to a properly rehabilitated landfill facility. The rest of the sites were earmarked for a temporary conversion to a properly operated facility and then closure in about 5 years.

Table 1 gives a breakdown of all the sites and how they were categorized.

Table 1. Site Categorization

Site Name	Landfill Status	Garden and construction or General waste
Albertinia	Operation	Garden and construction waste
Algeria	Closure immediately	General waste
Aurora	Closure immediately	Garden and construction waste
Barrydale	Operation	Garden and construction waste
Bitterfontein	Closure immediately	General waste
Buisplaas	Closure immediately	General waste
Calitzdorp	Operation	Garden and construction waste
Cape Infanta	Operation	Garden and construction waste
Clanwilliam	Closure in 5 years	General waste
De Doorns	Operational	General waste
De Rust	Operation	General waste
Dysselsdorp	Operation	General waste
Elandsbaai	Closure in 5 years	General waste
Eselsbank	Closure in 5 years	General waste
Genadendal	Closure in 5 years	General waste
Geyton	Closure in 5 years	General waste
Gouritsmound	Operation	Garden and construction waste
Graafwater	Close immediately	General waste
Herbertsdale	Closure immediately	General waste
Klaarstroom	Operation	General waste
Kliprand	Closure immediately	General waste
Koekenaap	Closure immediately	General waste
Koringberg	Closure immediately	General waste
Lambertsbaai	Closure in 5 years	General waste
Leeu Gamka	Operation	General waste
Leiploldville	Close immediately	General waste
Malgas	Closure immediately	Garden and construction waste
Melkhoutfontein	Operation	Garden and construction waste
Napier	Closure immediately	General waste
Piketberg	Closure immediately	Garden and construction waste
Prince Alfret	Operation	Garden and construction waste
Hamlet		
Redelinghuys	Closure in 5 years	General waste
Riebeek West	Operation	Garden and construction waste
Rietpoort	Closure immediately	General waste
Struisbaai	Closure in 5 years	Garden and construction waste
Touwriver	Operational	Garden and construction waste
Uniondale	Closure in 5 years	General waste
Waenhuiskraans	Closure immediately	Garden and construction waste
Wupperthal	Closure in 5 years	General waste

The sites varied in sizes from very small sites that receive one or two bakkie loads of waste per week to slightly larger sites being frequented by municipal trucks. These sites were classified according to the 1998 DWAF Minimum Requirements for Waste Disposal to Landfill. The purpose for classifying the waste sites is to take into consideration the best disposal method for the type of waste and the potential for possible leachate generation. The waste is firstly classified according to the waste class dividing the waste into two groups: General (G) or Hazardous (H) waste. General waste includes domestic waste, builder's rubble and garden waste. The disposal sites are secondly classified according to the size of the waste stream and the size of the operation at the end of the site's lifetime. The disposal sites visited were all of communal size: Communal (C) meaning that the maximum rate of deposition is less than 25 tonnes per day. The disposal sites were lastly classified according to their potential to generate leachate. The sites investigated were all determined to be B- sites, meaning that they generate leachate sporadically.

2.3.1 Operational sites

The operation and management specifications required to convert the current waste dump to a legally operating landfill that would cause the minimum impact on the surrounding environment, were included in the report.

The correct operation of a sanitary and environmentally safe landfill requires compliance to the specifications and requirements of the 1998 DWAF Document. These requirements were highlighted to the municipalities.

Immediate rehabilitation actions required at these sites include the following:

- proper and maintained all weather access routes to the landfill;
- access control at the entrance of the landfill site;
- proper traffic control and planning inside the facility;
- the control of nuisances that are a common occurrence on landfill sites;
- adequate site drainage, including the stormwater-, contaminated runoff- and leachate control;
- proper record keeping of all the site activities.

All of these aspects of the landfill need to be maintained in order to ensure smooth and efficient operation to prevent undue deterioration of any item.

The entrance to the site must be kept clean of waste and neat at all times to ensure sanitary conditions at the landfill. Access control will be implemented and performed in a responsible manner. The daily records of the landfill will be available for regular inspection by the Landfill Supervisor. The following points will be recorded for each waste load if applicable: mass of each waste load delivered, category and composition of each waste load, source of the waste, process from which waste originated, vehicle registration number, driver details, time and date of delivery, account number, verification tests performed on the incoming waste loads, volume of cover placed daily, complaints lodged, incidents/accidents, landfill protocol violations, breakdowns and stoppages, rainfall figures with full weather station data including minimum and maximum temperatures, rainfall, wind speed and wind direction. Monthly and annual reports will be prepared.

The Landfill Supervisor will take full responsibility for controlling nuisances on site. He will take reasonable measures to reduce and, where possible prevent dust, odour, flies and rodents, noise, windblown litter and scavenging. The windblown litter will be picked up on a daily basis. It was recommended to the Municipalities to appoint unskilled casual labour from the surrounding communities to pick up the windblown litter that is surrounding the landfill. The labourers will be provided with gloves and masks and a central collection point will be appointed where the litter can be sorted.

All the Site roads need to be maintained, permanent and temporary. This will include the watering of unpaved road surfaces to prevent dust nuisances, grading and filling of potholes, resurfacing of road surfaces with selected graded material or building rubble free from reinforcing and with particle size less than 100mm, as well as any other repair work required to ensure that all-weather access to the Landfill is provided in a safe and usable condition.

A weatherproof notice board will be erected at an approved location near the entrance of the Site. The notice board will display the operating times, the site rules, the type of waste that is accepted at the landfill, the rates involved in disposing of waste and the contact details of the Landfill Supervisor for emergencies.

Record and details of any violation of the site rules will be kept. The Landfill Supervisor should provide the employees with information on how an instance could be prevented in the future and must advise on remedial actions that can be implemented if such an instance were to happen again. Vehicles that violate the site rules will be blacklisted from being allowed to dispose of their waste at the site. If a waste load does not comply with the site standards, the Landfill Supervisor will have the responsibility of informing the driver of the vehicle that his waste load is rejected and must advise him to take his waste load to the nearest hazardous landfill site for classification. It is very important that the proper access control and waste classification happens at the landfill site. The Site can only accept waste that is permitted on the site according to the waste licence.

The actions that are required for the once off rehabilitation of the landfill site were stipulated in the document. This includes the repair of the fence around the site and the provision of the necessary infrastructure on the site. The infrastructure that is required for the successful operation of a landfill site includes a lockable gate to provide access control, a potable water tank and ablution facilities, solar powered lights at the entrance and a skip that can temporarily store unacceptable wastes.

All the landfill sites have to be fenced to prevent the public from entering the site illegally. The fence must be inspected regularly and the necessary maintenance done. Concrete palisade fencing must be installed. Other types of fencing are easily vandalized and stolen. A lockable gate has to be installed to provide access control to the landfill site.

2.3.1.1 Engineering Design Principles for Operational Sites

According to the new (2013) Waste Classification and Management Regulations, all sites that receive garden waste and general waste must have a Class B liner. This liner class requires a leachate collection and leachate detection system. As none of the current sites were operating in an environmentally sound manner, a rehabilitation and remediation plan was proposed.

All the waste on the site needs to be consolidated into one area in order to prepare the lined disposal cells that are required. For all operating sites, machinery like a TLB needs to be purchased in order to move waste and materials etc. If the site receives high volumes of garden waste, a compost system is recommended. Clean builders rubble must be separated from the other waste, including any reinforcement, to be used as cover material. A temporary storage area must be identified to accommodate the waste loads that the site will be receiving while the site rehabilitation is taking place. Personnel have to be appointed to see to it that the waste is dumped in the correct place.

If there is significant leachate remaining on the natural ground level after the waste has been removed, the leachate and the contaminated soil must be collected in an approved container (plastic double walled or a steel drum), tested and disposed of using a suitable disposal method. In the case of significant leachate generation, the advice of a Professional Engineer will be needed in order to design the required leachate collection system.

The authorities would not allow any waste disposal to trenches, thus the cell design was taken as the most appropriate disposal method. Waste disposal cells between 20m x 20m and 100m x 100m are proposed, depending on the amount of waste. The final design needs to be confirmed during the detail design phase of the project. The depth of the cell will depend on the geological conditions of the site, but 2m to 10m deep were advised. The side slopes may not be steeper than 1:3. Deeper cell construction will increase the lifetime of the facility. Care will be taken to ensure that the necessary safety measures are in place near the open cell. Signage and barricades will be put up around the area to warn people about the danger. Stockpile the excavated material near the cell for later use as a cover material. It is important to keep the manoeuvre space required by the vehicles that will be dumping the waste in mind.

If excavations are needed to create a waste disposal cell, geotechnical investigations must be done to determine the level of the water table. In the case of a shallow water table a more stringent design will be required in order to protect the groundwater from the leachate. The bottom of the cell has to be compacted as much as possible. The compaction will minimise the infiltration and migration of leachate into the groundwater according to the Minimum Requirements for Waste Disposal by Landfill (Department of Water Affairs and Forestry, 1998).

The liners prescribed for inclusion on the sites, followed the specifications of the NEMWA Waste Classification and Management Regulations (Government Gazette No. 36784).

During the installation of the layer works great care must be taken to ensure that the inherent characteristics of the layers are not compromised. The final liner system that will be used must be determined more accurately during the detail design phase.

After the liner has been installed in the waste cell, the stockpiled waste can be transferred into the cell. The waste must be spread into 300mm thick layers and compacted. The waste layer must be covered with 100mm to 150mm of the excavated soil, clean builder's rubble or chipped garden waste. The builder's rubble must be of manageable size and clean of any reinforcement steel. Compact the soil, the builder's rubble or the chipped garden waste. This process will be repeated until all the waste has been moved to the cell. The last waste layer in the cell should have at least 300mm soil cover with side slopes of a maximum of 1:3 to the natural ground level.

Daily cover on the working face of the landfill is required. The application of cover is required to reduce odour and to minimise windblown litter. A minimum of 100mm cover after 300mm waste must be placed but the cover thickness must be increased in the case of poor quality cover.

The compaction of the waste is very important. Daily compaction is required to reduce voids in the waste. A reduction in voids will result in reduced water infiltration and ultimately the amount of leachate that will form. A reduction in voids also reduces the risk of fires, discourages vermin, controls litter and increases the site life. Compaction can be achieved by passing heavy equipment over the deposited waste or cover layer.

For each site a site plan was developed showing positions of stormwater berms, leachate collection drains and a leachate collection pond. The position of these water management structures were determined by taking the topography of the site and surrounding areas into consideration.

In order to avoid groundwater contamination, a drainage trench must be constructed downstream of the waste cells to collect the leachate generated from the landfill. The drainage channels must be 1m deeper than the waste cell. A HDPE perforated drainage pipe must be installed in the trench and covered with a geotextile bidim material to prevent the pipe perforations from blocking. The pipe must be installed with a 2% slope in order to drain towards the underground conservancy tank. The trench must be backfilled with the excavated soil and compacted. It was recommended that the conservancy tank be inspected on a regular basis and emptied when 75% of its capacity is reached. The conservancy tank must have a vent that is open to the atmosphere for inspection purposes.

To prevent stormwater contamination, contact between the waste body and stormwater will be avoided. A system of berms and cut-off drains will be constructed around the perimeter of the landfill. The drainage system will divert the stormwater as well as unpolluted run-off from rehabilitated areas, around the landfill. Once a portion of the landfill has been rehabilitated, the run-off from that part of the site will be classified as unpolluted. The excavated material from the cell construction will be used to construct a berm upstream of the waste cell. Continued maintenance of the stormwater system will be done in order to keep it free draining. As new phases of the landfill are developed, the stormwater system will be extended accordingly. The berms and water channels will be maintained in a good working condition free from any blockages to effectively perform its intended function. The silt that might be accumulating on the drainage channels must be removed at regular intervals.

Hydrological investigations were completed at a desktop level.

Should water be accumulating in the daily cover borrow pit, it is to be drained / pumped from the excavations as soon as possible to prevent it from hampering the cover material excavations.

The authorities wanted a borehole to be drilled on site for monitoring purposes. Water samples must be taken every 6 months in April and October (end of summer and winter) and the samples must be sent to a reputable laboratory for analysis. Field readings, such as pH, temperature, EC, etc. should be taken at the same time as the samples. At the end of the 18 month monitoring period a monitoring report must be completed by a geohydrologist. This report will be used to determine if further monitoring will be needed. If traces of contamination are found in the groundwater, the department must be notified as soon as possible. A remediation plan should be put into action as soon as possible.

The site should be inspected on a regular basis to identify any erosion damage. Any such damage should be repaired as soon as possible to maximise the run-off.

2.3.2 Closure sites

A rehabilitation and closure plan was drawn up for the closing sites. The closure designs will ensure that the possible pollution risks are mitigated and managed, that infiltration of water into the landfill is controlled and that negative fugitive emissions from landfill gas will be eliminated.

The closure sites were divided into three different categories: rehabilitation only (sites that have been closed for a while or sites with very low volumes of waste), closure immediately and closure within 5 years.

To prevent the public from dumping their waste at closed sites, the sites have to be fenced and a notification board has to be placed at the site. The fence must be inspected regularly and repaired as soon as possible if necessary. The local community shall be informed of the landfill closure and made aware of alternatives to dispose of their waste. Security must be provided at the closed sites to prevent potential illegal dumping.

Two of the sites visited had very low volumes of illegally dumped waste. The recommendation for these sites was to consolidate all the waste in skips and take the waste to a legal landfill. To prevent further dumping a skip must be placed on site. The skip will be taken to a legal landfill on a regular basis that will be determined

by the rate of waste generation of the surrounding community. Where the waste has prevented natural vegetation from growing, 150mm topsoil must be placed.

For dumping sites that have been closed for a while and where the natural vegetation has been re-established, the rehabilitation methodology was to construct stormwater berms and drains around the landfill site. The stormwater berms will minimise the ingress of rain and stormwater into the waste material by diverting the stormwater around the waste body. The erosion gullies on have to repaired by filling them and stabilizing them.

The sites that need to be operational for a maximum time period of 5 years before final closure will have to comply with the Operational Requirements as described earlier in the paper.

When the landfill is to be closed, all the waste on and around the site must be consolidated in one area. The waste dome must be shaped to form a cell of no more than 2m high with 1:3 side slopes and must be compacted. The waste must be covered with soil available on site or imported. The soil layer must be compacted. If the landfill received only garden waste and builder's rubble, 200mm topsoil and a hydroseed mix must be placed on top of the compacted soil. In the figures below the capping system prescribed can be seen. If there were evidence of general waste on site, a 300mm clay layer has to be placed on top of the soil cover before the topsoil and hydroseed is placed. The final plateau of the landfill cells must have a 3% slope to encourage the flow of water at the plateau whilst discouraging ponding on top of the landfill.

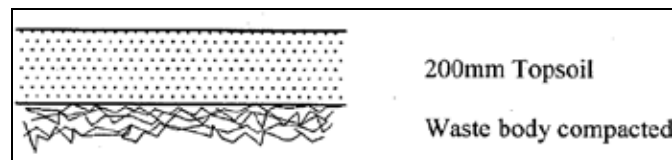


Figure 2: Typical capping detail for a garden waste and builders rubble site (DWAF, 1998)

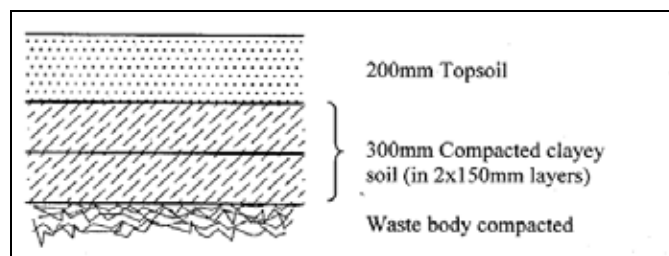


Figure 3: Typical capping detail for a general waste site (DWAF, 1998)

The landfill will be shaped and capped in such a way to minimise the infiltration of water into the waste body. To prevent the leachate from the waste body from contaminating the groundwater, a cut off trench and porous pipe must be installed downstream of the landfill. The leachate will flow into a conservancy tank that will be installed at the most downstream point of the landfill.

Stormwater berms and drains will be constructed around the waste body to divert the stormwater around the waste body, preventing the clean water from coming in contact with the contaminated water.

After the site has been closed and capped, post closure monitoring is required. The monitoring actions includes the inspection of all erosion and sediment control devices on a regular basis, inspection of the cover to determine any breach in cover integrity, inspection to identify if the vegetation has established on the landfill and the removal any alien vegetation. The leachate in the conservancy tank should be monitored at regular intervals (initially quarterly) and the results must be reported to the authorities and a Professional Engineer who will decide whether further work will be required.

2.4 Public Participation Process

The main objectives of the Public Participation Process was to inform the Interested and Affected Parties (I&AP) about the technical information regarding the proposed development and the environmental process, to create networks and feedback mechanisms where I&AP can raise their viewpoints with regard to the proposed development and to ensure that the views of the I&AP's are reflected and taken into consideration by the authorities.

Through networking and advertisements 200 I&APs were registered on the I&AP register for this project. In order to give the project a global approach, the I&APs were registered on one database. An effort was made to ensure that individuals and/or organisations were identified from a relevant institutional and geographical point of view.

Various mechanisms were used to make the public aware of the proposed project. Over a week, Advertisements were placed in different local newspapers. An advertisement was again placed to indicate amendments and the availability of the Draft Basic Assessment Report. Two site notices were placed in the vicinity of each site during the first site visits. The Public Participation Manager worked with the Project Managers to ensure that the legal requirements for the public participation process were met.

Information was distributed to the registered I&APs by means of a BID. The BID document provided background information on the proposed project, the processes that had to be followed and the appropriate contact details of the Public Participation Consultant. A sms and an email were sent to I&APs to inform them that the Draft Basic Assessment was ready for review and contact details were provided on all written communications to ensure that the I&APs can interact with the project team. Dedicated web sites and Facebook pages were developed for each site. All documentation was available for download from the web sites.

Technical meetings were held with all the municipal representatives to discuss the technical aspects contained in the Environmental Management Plans. Meetings were also held with the community liaison officers to ensure that the information is also provided to the affected communities.

The Department of Water Affairs, Cape Nature and Heritage Western Cape were identified as key stakeholders. These stakeholders were contacted very early on in the process to ensure that they are able to comment on the reports within the given timeframe. The receipt of 50 separate letters from each of these stakeholders by the end of the public review period was a feat worth noting as well. There are usually only a few people that work within these entities and to review and provide extensive comment on individual sites was an onerous task by itself.

All the issues that were raised during the Public Participation Process was noted and collated into separate Comments and Response Registers (CRR) for each site and this formed part of the Final Basic Assessment Report for each site.

The Draft Basic Assessment Reports were available for the registered I&APs to review for 40 days and electronic copies were made available on request. The Final Basic Assessment Reports were also made available to the registered I&APs for a period of 21 days.

Regulated timeframes necessitated strict management of technical inputs to the process, to ensure that information was available on time for each of the PP steps. In order to ensure that each milestone was achieved on time, a multi-level project management model was developed. This is shown on the next page.



A clear guideline was developed on roles and responsibilities, weekly meetings held and ongoing schedule updates circulated to each team member. All team members, from GIS to Project Director were included in communications, to ensure that each member was kept updated on critical tasks.

By having a separate project manager responsible for the overall process, critical milestones could be monitored and delivery by the other project managers assured independently to the technical processes. The role of this independent project manager became invaluable when solutions were required to solve potential conflicts.

The role of the environmental co-ordinator was to link common input needs across the various technical teams. This included the preparation of GIS maps, Annexures, co-ordinated printing etc. In total 600 reports were printed and delivered in draft and final forms for each site in the Western Cape. The weight of the reports was 240 kg, 300 reams of paper were used, 2400 A3 maps were printed, 400 CDs were written, and 600 sms and emails were sent.

2.5 Implementation of the EMPs

A waste licence would be issued once the DEADP has reviewed the information, sought clarity where required, received comment from the various commenting authorities and the Record of Decision from the department of Water Affairs. The EMP that is part of the waste license becomes a legally binding document on how the landfill is to be managed into the future. This is potentially where the likely stumbling block may be. Municipalities do not have the money. It is one thing to become licenced, but another to put into action the requirements. Costs were estimated for each site and these range from a few hundred thousand rand to a few million rand. Consultation with the municipalities during the process raised serious concerns on their ability to comply with the requirements. These municipalities struggle to deliver on current needs, let alone rehabilitate legacies of the past. The financing of the latter is the next challenge for government. Which tax payers will pay, be it local or national.

2.6 Conclusions

Landfills or disposal facilities in small towns of South Africa are for the most part very poorly operated. Government tries to regulate this through legislation and having the sites licensed. This does not always mean good operation but is still a step in the right direction. Obtaining a waste license for the closure or operation of a communal landfill site can take up to 6 months or more since it requires a BAR and public participation etc. All licensing authorities do not have the knowhow, and in some cases the political will, to process these applications. The benefit of this project was that the authorities were part of the process and thus had an interest in the process from the start. This kind of project does not come around often and required extensive project management experience. We hope that by obtaining waste licenses for the facilities, the negative environmental impacts will be minimised.

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