



Jones & Wagener

Engineering & Environmental Consultants

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WASTE & TAILINGS CAPABILITY STATEMENT

Jones & Wagener is a firm of engineering and environmental consultants, established in 1966. Our capabilities relating to Waste & Tailings are discussed below in more detail.

WASTE & TAILINGS

Expertise

Jones & Wagener has been active in the field of waste and tailings management for the past three decades and our involvement has covered the design, operation monitoring and rehabilitation of:

- **commercial waste disposal facilities**, for both general and hazardous waste;
- **mining waste** including coal, gold, diamond, manganese and vanadium;
- **industrial waste** including petro-chemical industries, power generation ash, paper, fertilizer factories, metallurgical slags and steel manufacturing plants;

The service we offer in the field of waste management covers a wide scope of activities, including:

- Environmental impact studies;
- Obtaining statutory approvals and facility licences;
- Geohydrological and hydrological investigation;
- Geotechnical investigations;
- Assessment and costing of disposal alternatives and feasibility studies;
- Design of disposal facilities and associated infrastructure;
- Design and implementation of remediation, capping and closure measures;
- Design of landfill gas extraction, conveyance and destruction systems;
- Project management and construction supervision;
- Ongoing surveillance and auditing of mine and industrial/hazardous waste deposition facilities



As a company we strive to keep abreast of the latest technology in waste management by regular attendance and presentations at local and international conferences and ensuring that we receive and study local and international literature. Our staff are also encouraged to join and actively participate in professional societies, at present we are represented at the following institutions:

- The South African Institute of Civil Engineers and its branches;
- The Institute of Waste Management of Southern Africa;
- The Geosynthetics Interest Group of South Africa;
- The Land Rehabilitation Society of Southern Africa;
- The South African Ash and Coal Association.

We are the only South African owned consulting firm that belongs to the Geosynthetics Institute (GSI), based in the United States of America, which affords us access to results from GSI's many research projects, as well as the latest geosynthetic publications.

Our philosophy is to provide a cost-effective service, using a level of technology appropriate to each specific client's needs and with careful attention paid to environmental considerations.

Client Base

The main clients we have or are currently working for include:

- Waste: EnviroServ Waste Management, Ekurhuleni Metropolitan Municipality, Coega Development Corporation.
- Mining: De Beers, Sasol Mining, Harmony, Kumba, Lonmin, Namdeb, Trans Hex, Exxaro, Sibanye Limited, Glencore, Petra Diamonds, Newmont, Anglo American, AngloGold Ashanti.
- Industrial: Sasol, Eskom, Natref, Scaw Metals, Kynoch Fertilisers, ArcelorMittal, Everite, Lanxess CISA, Manganese Metal Company.



Significant Projects

The Waste and Tailings department of Jones & Wagener has been involved with the following major waste management projects:



Name of client and site

Project

Hazardous Waste

ArcelorMittal
Emergency Dam

Detailed design of a hazardous emergency storage dam – Newcastle – 2013 to 2014

ArcelorMittal
Hazardous waste disposal cell

Detailed design and construction supervision of Phase 2 of the H:H waste disposal site - Newcastle - 2010

Coega Development Corporation
CDC landfill

Conceptual design of a new H:H landfill for Port Elizabeth– Port Elizabeth - 2005

Coega Development Corporation

Waste Management Philosophy for a Regional Facility, Design for Permit Application, Operating Manual, Response Action plan - Port Elizabeth - 2005 and 2007 to 2009.

EnviroServ
Aloes H:H landfill

Design and construction of Aloes 2 H:H landfill expansion – Port Elizabeth – 2010 to 2014.

EnviroServ
Holfontein H:H landfill

Design and construction of new leachate storage dams and upgrading of existing leachate storage dams at the Holfontein H:H landfill – Springs - 1997 to 2001

EnviroServ
Holfontein H:H landfill

Design and construction of contaminated stormwater management and containment measures at the Holfontein H:H landfill – Springs - 2001

EnviroServ
Holfontein H:H landfill

Design and construction of high hazard waste encapsulation silos at the Holfontein H:H landfill – Springs – 1999 to 2008

EnviroServ
Holfontein H:H landfill

Design and construction of plant haul road and entrance facility upgrades at the Holfontein H:H landfill – Springs – 2001 and 2011 to 2012



Name of client and site	Project
EnviroServ Holfontein H:H landfill	Design and construction of six hazardous waste disposal cells at the Holfontein H:H landfill – Springs - 1999 to 2013
EnviroServ Holfontein H:H landfill	Conceptual design and inputs into EIA study for the expansion of the Holfontein HH landfill site – Springs – 2009
EnviroServ Nigeria hazardous landfill	Concept design and costing of a hazardous waste site in Port Harcourt – Nigeria - 2012
EnviroServ Shongweni h:H	Design and construction of new cells, access routes and liner extensions at the Shongweni h:H landfill – Durban – 1997 to 2008
EnviroServ Holfontein H:H landfill, Shongweni H:h landfill Aloes H:H landfill	Data capture, interpretation and modelling of Liquid Management Models – Holfontein H:H landfill, Shongweni H:h landfill and Aloes H:H landfill – 1997 to 2013
EnviroServ Shongweni h:H	Detailed and construction of Valley 2 expansion of the Shongweni h:H Landfill – Durban – 2008 to 2014
EnviroServ Uganda hazardous landfill	Detailed design and construction of a hazardous waste site in Nyamasoga – Uganda – 2013 to 2014
Kupferberg landfill site – Namibia – Windhoek	Feasibility study for the expansion of the general and hazardous waste disposal cells at the Kupferberg landfill site – Namibia – 2005
Lanxess CISA Newcastle	Design and construction of new hazardous waste lagoon Phase 3– Newcastle – 2006 to 2008
Lanxess CISA Newcastle	Design and construction of new hazardous waste lagoon Phase 4 – Newcastle – 2014
Manganese Metal Company Kingstonvale H:H landfill	Detailed design of Phase 2 at the Kingstonvale residue management facility – Nelspruit – 2013 to 2014
Natref Sasolburg	Effluent evaporation and contaminated stormwater handling facilities – 2002-2004.
Ongopolo H:H site Namibia	Engineering design of a new hazardous waste site – Namibia – 2008 to 2012.
Sasol Synthetic fuels, Secunda Fine Ash Dam 5 and Black Products Area	Permit application for Fine Ash Dam 5 (GLB+) and Black Products Area (H:H), in conjunction with SRK Consulting - 2000.



Name of client and site	Project
Sasol Synthetic Fuels BP6, Sulpholin disposal facility	Permitting, design and construction of new hazardous waste lagoon and landfill – Secunda – 2004
Sasol Synthetic Fuels Extension to BP6 disposal facility	Basic Engineering – Secunda - 2012
Wasteman Bulbul H:h landfill	Design and construction of liner extensions to existing cells at the Bulbul H:h landfill – Durban - 1999 to 2008
Wasteman Bulbul H:h landfill	Design and construction of a hazardous waste disposal cell, stormwater dam and leachate balancing tanks at the Bulbul H:h landfill – Durban - 2004
Xstrata/Glencore Rhovan Calcine dump	Detailed design and construction supervision of Calcine Dump Phase A1 (2009) and Phase A2 (2013) - Rhovan

Ash Disposal Facilities

Eskom Komati	Extension onto ash tailings facility with a composite barrier – Komati – 2011 to 2014
Eskom Medupi	Dry ash stack disposal facility with a composite barrier – Medupi – 2011 to 2014
Eskom Khusile	Dry ash stack disposal facility with a composite barrier – Khusile – 2011 to 2013
Eskom Kriel	Extension onto ash tailings facility with a composite barrier – Kriel – 2011 to 2013
Eskom Majuba	Additional ash storage modelling – Majuba – 2011 to 2013
Sasol Technology Secunda	Fine Ash Dam 6 with composite barrier including process water dam, pump station and piping designs – Secunda – 2009 to present
Kuyasa Mining KiPower IPP Project	Dry ash disposal facility with single composite liner for 600 MW independent power plant. Conceptual Design and environmental authorisations – Delmas – 2014 to present.
Eskom Kriel Power Station	Site selection, Conceptual and Detailed design of Ash Dam 4, 2010 – present

Rehabilitation and Closure

ArcelorMittal Vanderbijl Park	Closure Design of Slag Disposal Site – Vanderbijl Park – 2008
EnviroServ Aloes H:H landfill	Design and construction of the partial capping and rehabilitation of the Aloes H:H landfill – Port Elizabeth – 2010 to 2014



Name of client and site	Project
EnviroServ Aloes H:H landfill	Design and construction of stormwater control measures on the leachate impoundment dam and closed site at the Aloes H:H landfill site – Port Elizabeth – 2004
EnviroServ Chloorkop GLB	Design and construction of the partial capping and rehabilitation of the Chloorkop GLB landfill site – Johannesburg – 2008 to 2009
EnviroServ Holfontein H:H landfill	Design and construction of the capping and rehabilitation of the high hazard waste encapsulation area at the Holfontein H:H landfill –Springs – 2005
EnviroServ Holfontein H:H landfill	Design and construction of upstream clean groundwater cut-off system for the Holfontein H:H landfill – Springs – 2004 to 2010 and 2011 to 2013
EnviroServ Shongweni Valley 1 H:h	Design of capping and rehabilitation of the Shongweni Valley 1 H:h landfill – Durban – 2009 to 2012
EnviroServ Umlazi H:h landfill	Design and construction of the closure and rehabilitation of the Umlazi H:h landfill including leachate seepage control measures – Durban – 2000 to 2003
EnviroServ Umlazi H:h landfill	Design and construction of the closure and rehabilitation of the north cell of the Umlazi H:h landfill – Durban – 2008
EnviroServ Westville H:h landfill	Design and construction of the closure and rehabilitation of Westville H:h landfill including leachate seepage control measures – Durban – 2002
Everite Klipriver and Brackenfell	Closure Design of Asbestos Waste Facilities – Klipriver and Brackenfell – 2002 to 2004
Iscor Vereeniging Kynoch Potchefstroom	Rehabilitation of the Vaal Dump and Ash Dump. Remediation design implementation.
Lanxess CISA Newcastle	Design and construction of the closure of Phase 1 of Hazardous Waste Lagoon Facility – Newcastle – 2011 to 2013
Metalloys	Engineering design of rehabilitation and closure of slag disposal area.
Sasol Secunda Sasol Synthetic Fuels	Design of Remediation Project for Black Products Area – Sasol Secunda – 2002 to 2006
Sasol Secunda	Conceptual Design of Closure and Rehabilitation of a 600Ha Coarse Ash Dump – 2004
Scaw Metals	Design and construction of the capping and rehabilitation of Site 3 at Scaw Metals – Germiston – 2005 to 2008

Landfill Gas



Name of client and site	Project
City of Johannesburg	Technical inputs to the transaction advisory team for City of Johannesburg landfill gas to energy project- Johannesburg – 2008 to 2009
Ekurhuleni Metropolitan Municipality	Design of full scale gas extraction and destruction projects for four Ekurhuleni landfill sites – Johannesburg – 2006 to 2009, 2010 to 2013 and 2013 to 2016.
Enviroserv Chloorkop CDM project	Technical input for CER verification of the Chloorkop CDM project – Johannesburg – 2008 to 2012
EnviroServ	Technical assistance with a feasibility study to evaluate landfill gas potential and possible sale for Certified Emissions Reductions at all EnviroServ's landfill sites – 2004
Enviroserv Chloorkop GLB	Design and construction of a pilot landfill gas extraction system at the Chloorkop GLB landfill site – Johannesburg – 2005
Enviroserv Chloorkop GLB	Design of full scale gas extraction and destruction project on the Chloorkop GLB landfill site Johannesburg – 2007 to 2008
Enviroserv Chloorkop GLB	Design of the ongoing expansion of the well field and additional flare for the Chloorkop GLB landfill site – 2008 to 2012
Nelson Mandela Metropolitan Municipality	Technical assistance with a feasibility study to evaluate landfill gas potential and possible sale for Certified Emissions Reductions at all Nelson Mandela Metropolitan Municipality landfill sites – 2006
Tshwane Metropolitan Municipality	Technical assistance with a feasibility study to evaluate landfill gas potential and possible sale for Certified Emissions Reductions at all Tshwane Metropolitan Municipality landfill sites – 2006

Mine Residue Facilities

Anglo American Thabazimbi Iron Ore Mine	Tailings Dam 5 cross-valley rockfill dam. Detailed concept design – Thabazimbi - 2014 to present.
AngloGold Ashanti Obuasi, Ghana	Conceptual design of the new Tailings Storage Facility (TSF) for Obuasi including closure of the current Sansu TSF. 2010 to present
AngloGold Ashanti Obuasi, Ghana	Stabilisation of Sansu Tailings storage facility. 2009
AngloGold Ashanti Vaal Reefs	Design of the Queen Mary dam with a composite lining system. 2011



AngloGold Ashanti Iduapriem, Ghana	Design of closure of the interim TSF. 2011
AngloGold Ashanti Siguiiri, Guinea	Feasibility design of new RWD. Dec 2014 to present.
AngloGold Ashanti Siguiiri, Guinea	Concept and prefeasibility design of new TSF alternatives. 2015
AngloGold Ashanti Siguiiri, Guinea	Prefeasibility of TSF Extension to increase LOF to 2023. Jan 2015 to Present.
AngloGold Ashanti Obuasi, Ghana	Feasibility design of two compartment TSF. 2014
AngloGold Ashanti Obuasi, Ghana	Detail design of three compartment Dokyiwa TSF and related infrastructure TSF. 2012-2014
ArcelorMittal VanderBijlpark	Conceptual and detailed design of Slag dump capping system. 2008- 2009
De Beers Venetia Diamond Mine	Underground Project. Design of kimberlite fine residue deposit extension with waste rock wall. 2008 to present.
De Beers West Coast	Design of various tailings facilities for diamond mines. 2002 to 2006
Eskom Medupi	Excess Coal Stockyard, 7 million tons storage facility with single composite liner Phases 1 and 2, design and construction supervision. 2012 to present.
Exxaro Grootegeluk Mine	Conceptual design of Coal Fines Tailings Storage Facility. 2009 – 2010, Ellisras.
Glencore Xstrata Rhovan Mine	Calcine Pad Phase 2, double-composite liner, design and construction supervision –Brits - 2014.
Glencore Xstrata Rhovan Mine	Design & construction supervision of Tailings Dam 2. 2011-2012
Glencore Xstrata Rhovan Mine	Detailed design & construction supervision of Purge Dam, Storm Water Dam 5, Calcine Pad Phase 1, 2009.
Gold Fields Beatrix Mine	Design and construction supervision of gold Tailings Dam No. 2 and associated infrastructure. 2002
Harmony Gold Mining Project Saints	Feasibility study and conceptual design for tailings facilities Welkom. 2007-2008
Kynoch Potchefstroom	Design and Construction supervision of Lined Gypsum Tailings Dam and associated infrastructure. 2003 & 2004



Namdeb Orange River Mines	Design and construction supervision of Fine Residue Deposit No. 4 2002
Newmont Ahafo, Ghana	Life of mine design of tailings storage facilities, selection phase. 2014
Sasol Mining Twistdraai Export Mine	Design and Construction supervision of Coal Fines Facility. 2002 to 2006
Sasol Synthetic Fuels Secunda	Design and Construction Supervision of Fine Ash Dam 5. 2001
Total Coal South Africa Dorsfontein East Mine	Design and construction supervision of coal discard and coal fines facility. 2014
Trans Hex West Coast	Design of various tailings facilities for diamond tailings dams. 2002 to 2006
Trans Hex Tirisano Mine	Design and construction of fine tailings disposal facility. 2004
Xstrata Alloys Lydenburg	Detailed design of waste site components including rehabilitation of old slag dumps, construction of new slag dumps, slimes dams, - 2009 - 2012
Xstrata Alloys Steelpoort	Conceptual, detailed design and construction management of new slimes dam and slag dump. 2003 – 2006
Xstrata Coal Goedgevonden Colliery	Design of Mine Residue Facility. 2005 & 2006
<i>Mine Residue Monitoring</i>	
De Beers Venetia Diamond Mine, Kimberley, Voorspoed	Surveillance of kimberlite fine and coarse residue deposits. 2008 - present
Evander Gold Mines Evander	Surveillance of tailings dams and annual audit of facility. 1999 - 2008
Gold Fields/Sibanye	Ongoing surveillance of gold tailings dams, Beatrix and Oryx mines, 2001 to present.
Harmony Gold Mining Free State	Stability assessment by piezocone testing for tailings dams. 2013 to present. Ongoing.
Highveld Steel Witbank	Surveillance of iron and steel plant tailings. 2000 – 2012.
Petra Diamonds Cullinan and Finsch Mines	Surveillance of kimberlite fine and coarse residue deposits. 2008 – present.



Sasol Chemical Industries

Sasolburg

Surveillance of fine ash dams 1999 to present.

Various clients

Namdeb, Black Mountain/Vedanta Resources, Trans Hex, Highveld Steel

Tailings facilities operational surveillance, risk management, ad hoc design work. 2004-present

Xstrata Alloys

Steelpoort

Surveillance of furnace slimes dam and slag dump. 2006 - 2009

