

10.4 The Specialist

Note: Duplicate this section where there is more than one specialist.

I, Jacobus Johannes Jordaan, as the appointed specialist hereby declare/affirm the correctness of the information provided as part of the application, and that I:

- in terms of the general requirement to be independent (tick which is applicable):

☒	other than fair remuneration for work performed/to be performed in terms of this application, have no business, financial, personal or other interest in the activity or application and that there are no circumstances that may compromise my objectivity; or
-------------------------------------	---

☐	am not independent, but another EAP that is independent and meets the general requirements set out in Regulation 13 has been appointed to review my work (Note: a declaration by the review specialist must be submitted);
--------------------------	--

- have expertise in conducting specialist work as required, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- will ensure compliance with the EIA Regulations 2014;
- will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the application;
- will take into account, to the extent possible, the matters listed in regulation 18 of the regulations when preparing the application and any report, plan or document relating to the application;
- will disclose to the proponent or applicant, registered interested and affected parties and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority or the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority (unless access to that information is protected by law, in which case I will indicate that such protected information exists and is only provided to the competent authority);
- declare that all the particulars furnished by me in this form are true and correct;
- am aware that it is an offence in terms of Regulation 48 to provide incorrect or misleading information and that a person convicted of such an offence is liable to the penalties as contemplated in section 49B(2) of the National Environmental Management Act, 1998 (Act 107 of 1998).

 Digitally signed by Jordaan,
Johan (ZAJJ05077)
Reason: I have reviewed this
document
Location: Johannesburg
Date: 1-Jul-25

Signature of the specialist

WSP Group Africa (Pty) Ltd

Name of company

1 July 2025

Date



10.5 The Review Specialist

I, as the appointed review specialist hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that I:

- am independent, and other than fair remuneration for work performed in terms of this application, have no business, financial, personal or other interest in the activity or application and that there are no circumstances that may compromise my objectivity;
- am fully aware of and meet all of the requirements of Regulation 13, and that failure to comply with any the requirements may result in disqualification;
- have reviewed/will review all the work undertaken by the specialist;
- have disclosed/will disclose, to the applicant, the EAP, other specialist (if any), the Department and interested and affected parties, all material information that have or may have the potential to influence the decision of the Department or the objectivity of any report, plan or document prepared or to be prepared as part of the application; and
- am aware that a false declaration is an offence in terms of regulation 48 of the 2014 NEMA EIA Regulations.

Signature of the review specialist

Name of company

Date





TECHNICAL NOTE -CONCEPTUAL STORM WATER MANAGEMENT PLAN

DATE:	04 June 2025	CONFIDENTIALITY:	Confidential
SUBJECT:	MCCAIN FOODS SA DELMAS FACTORY - PROPOSED WATER TREATMENT PLANT - CONCEPTUAL STORM WATER MANAGEMENT PLAN		
PROJECT:	41107366	AUTHOR:	Johan Jordaan
CHECKED:	Stephen Wesson	APPROVED:	Olivia Allen

Digitally signed by
61A68E8C-1C41-44CC-
8C72-D358ABE72C0E
Date: 2025.06.09
15:57:32 +02'00'

Digitally signed by Jordaan,
Johan (ZA1305077)
Reason: I have reviewed this
document
Location: Johannesburg
Date: 9-Jun-25

BACKGROUND AND INTRODUCTION

McCain Delmas proposes to develop a new wastewater treatment plant (WWTP) to treat effluent that is generated from the manufacturing process. The plant will have a maximum treatment flowrate of 3 400 m³/day and will be located in the northwestern corner of the site, on McCain-owned property. The effluent will be treated to meet the quality requirements that would be suitable for discharge to municipal sewer or for plant use (potable water quality). Waste activated sludge (WAS) from the treatment plant will be temporarily stored in hoppers on site and ultimately disposed offsite.

The plant will include an anaerobic digestion process for chemical oxygen demand (COD) containing wastes on site, such as fryer waste, slivers, and other materials that are collected in the main wastewater screen and oily-water screen. The anaerobic digester will convert the COD into biogas, which can be used to either generate power or displace natural gas in the processing plant's boilers. The digester feed flow will be approximately 385 m³/day, with a total digestion volume of 9 074 m³.

The development footprint for the facility will be approximately 9 000 m² and will include the following key infrastructure components:

- Primary Clarifier
- Equalisation Tank
- Upflow Anaerobic Sludge Blanket (UASB) Feedtank & Pumps
- UASB Sludge
- Activated Sludge
- Waste Water Process Building
- Secondary Clarifier
- Biogas Digester
- Biogas & Power Building
- Flare

Proposed diesel tank:

McCain Delmas cumulatively stores 43.782 m³ of diesel in various tanks on site and proposes to install an additional 79 m³ diesel storage tank next to a current 30 m³ diesel storage tank. The proposed diesel storage tank will be a self-bunded (double wall) containerised tank, with the same design as the current 30 m³ diesel storage tank.

TECHNICAL NOTE -CONCEPTUAL STORM WATER MANAGEMENT PLAN

DATE:	04 June 2025	CONFIDENTIALITY:	Confidential
SUBJECT:	MCCAIN FOODS SA DELMAS FACTORY - PROPOSED WATER TREATMENT PLANT - CONCEPTUAL STORM WATER MANAGEMENT PLAN		
PROJECT:	41107366	AUTHOR:	Johan Jordaan
CHECKED:	Stephen Wesson	APPROVED:	Olivia Allen

As part of the specialist studies, a conceptual storm water management plan for the WWTP footprint is required. This technical memorandum, read with two associated conceptual drawings, presents the proposed storm water management plan for the WWTP.

OBJECTIVE

The objective of the storm water management plan is to propose infrastructure and operation at a conceptual stage for directing storm water to avoid flooding and nuisance, as well as to separate clean and dirty runoff and propose measure for managing accumulated dirty storm water.

INFORMATION AVAILABLE

A CAD-format (.dwg) of the factory layout was received from McCain. The layout includes a WWTP schematic showing unit processes and the infrastructure layout.

An updated georeferenced survey was not received.

Importantly, the plant terrace level, along with earthworks cut and fill around the perimeter, was not available.

STORM WATER MANAGEMENT PLAN

This section must be read in conjunction with the accompanying drawings, namely:

- 41107366-100-001 CONCEPTUAL STORM WATER MANAGEMENT PLAN
- 41107366-100-002 CONCEPTUAL STORM WATER MANAGEMENT PLAN – TYPICAL DETAILS

The conceptual storm water management plan is described as follows:

1. Peripheral storm water approaching the plant footprint will be intercepted by V-drains or trapezoidal channels on the WWTP edges as required. Drawing 001 shows provisional channels at the north and east edges of the plant; this may vary depending on bulk earthworks undertaken to construct the plant platform.
2. The perimeter clean water cut off channels will be sized to convey the 1:10-year 24-hour storm event.

TECHNICAL NOTE -CONCEPTUAL STORM WATER MANAGEMENT PLAN

DATE:	04 June 2025	CONFIDENTIALITY:	Confidential
SUBJECT:	MCCAIN FOODS SA DELMAS FACTORY - PROPOSED WATER TREATMENT PLANT - CONCEPTUAL STORM WATER MANAGEMENT PLAN		
PROJECT:	41107366	AUTHOR:	Johan Jordaan
CHECKED:	Stephen Wesson	APPROVED:	Olivia Allen

3. The clean storm water conveyance channels will be lined with either riprap or gabion mattresses backed by non-woven filtration geotextile as specified.
4. Channel preparation will be guided by a geotechnical investigation. Topsoil will be stripped and the channel excavated to lines and levels shown on the drawings. Where unsuitable material or hard excavation are encountered, the material will be excavated and replaced by suitable backfill material as directed by the geotechnical engineer. The channel floor and sides will be compacted and the lining installed. Topsoil will be stockpiled as directed and spoil material disposed.
5. The terminal ends of the channels will daylight and discharge storm water onto a scour apron designed to arrest water energy and disperse the flow to substantially sheet flow. The sheet flow will report to the existing perimeter channels and be conveyed to the storm water exit point from where it will join municipal storm water infrastructure.
6. It has been assumed that for storm water planning purposes, the full footprint of the WWTP will generate dirty (contact) runoff. Internal drainage within the WWTP platform will be sized to convey the 1:5-year 24-hour storm peak runoff (Department of Human Settlements, 2019).
7. Due to confined space, the storm water will be intercepted by catchpits constructed in reinforced concrete, covered by open slot grating covers. The catchpits will be linked by a below-surface pipe system comprising pre-cast spigot and socket pipes installed in trenches with appropriate pipe bedding and backfill, after which plant layer works and hardstand such as reinforced concrete or interlocking paving blocks will be constructed. The grid covers will be slightly recessed to create low points for storm water capture.
8. Depending on the water quality (not only storm water but any water which may report to the catchpits), concrete pipes and structures may need sacrificial thickness or lining material to protect against concrete corrosion.
9. The design of the system must provide sufficient pipe slopes to ensure that pipes are self-cleansing with regards to sediments washed into the system.

TECHNICAL NOTE -CONCEPTUAL STORM WATER MANAGEMENT PLAN

DATE:	04 June 2025	CONFIDENTIALITY:	Confidential
SUBJECT:	MCCAIN FOODS SA DELMAS FACTORY - PROPOSED WATER TREATMENT PLANT - CONCEPTUAL STORM WATER MANAGEMENT PLAN		
PROJECT:	41107366	AUTHOR:	Johan Jordaan
CHECKED:	Stephen Wesson	APPROVED:	Olivia Allen

10. It is assumed that the treatment plant islands will be slightly raised and that their edges will be defined by semi-mountable kerbs, with mountable kerbs only where access is required. Runoff from the plant islands will be directed by sloping the surfaces towards the internal roads along which the catchpits will be situated. Roads will be sloped to direct runoff towards the catchpits as shown on drawing 001.
11. A plant sump with a pump, and potentially an oil filter system, will need to be included in the detail design of the WWTP as a sink. The purpose of the plant sump would be to collect dirty storm water runoff collected by the catchpit system. Process spillage, bund area overflows and washdown will also report to the sump.
12. It is proposed that the plant sump water be fed back into the WWTP feed water if appropriate. If the plant sump water is demonstrated to comply with governing effluent water quality standards, it can be discharged to the municipal sewerage system for treatment.
13. The design of the plant sump must also facilitate removal of transported sediments and grit which can be allowed to dry and disposed at a licensed facility depending on the waste assessment for the sediments.
14. With regards to plant sump sizing, consideration can be given at design stage to allow for a first flush system whereby the first flush is retained, and the balance of the design storm event is allowed to bypass and be discharged to the nearest peripheral storm water diversion channel.
15. The access road/ramp to the plant must be designed such that excess storm water runoff generated during larger storm events than that provided by the design criteria, can bypass via the ramp and be directed to a scour apron along the road; this will be required infrequently and will not result in extended nuisance or access problems.
16. By virtue of constructing an impermeable hardstand around the plant infrastructure, higher runoff flow can be expected from that sector of the site. In instances where the 1:5-year storm event is exceeded; excess water will overflow from the footprint as described above. During detail modelling



TECHNICAL NOTE -CONCEPTUAL STORM WATER MANAGEMENT PLAN

DATE:	04 June 2025	CONFIDENTIALITY:	Confidential
SUBJECT:	MCCAIN FOODS SA DELMAS FACTORY - PROPOSED WATER TREATMENT PLANT - CONCEPTUAL STORM WATER MANAGEMENT PLAN		
PROJECT:	41107366	AUTHOR:	Johan Jordaan
CHECKED:	Stephen Wesson	APPROVED:	Olivia Allen

and design, it must be checked whether the existing storm water exit from site as well as the receiving culverts are adequately sized or require additional capacity.

CONCLUSION

A conceptual storm water management plan has been proposed based on available information. The storm water management plan is not stand-alone and will be dependent on the design and operation of the plant footprint. The objective is to direct storm water to prevent flooding for given design criteria and to separate clean and dirty runoff. Clean runoff must reach the municipal storm water network in a controlled manner and dirty storm water must be collected and managed based on water quality. Storms beyond the design specification must be allowed to leave the WWTP footprint and be discharged to a scour/erosion apron and leave the premises to the municipal storm water system, where the capacity requires confirmation base on additional impervious catchment. Care must be taken in the selection of materials of construction in ensuring that the materials will be durable against the expected water quality. The system will not be maintenance free, and design must ensure that the system can be flushed by specialist companies and audits must be undertaken to monitor system integrity and seasonal storm water quality.

REFERENCES

Department of Human Settlements. 2019. *The Neighbourhood Planning and Design Guide*. 1.1. Pretoria : South African Government, 2019. p. 697. ISBN: 978-0-6399283-2-6.

CONTACT DETAILS OF SPECIALIST

Contact name: Johan Jordaan
Contact details: +27 11 254 4903 | johan.jordaan@wsp.com



Johan Jordaan

Earth & Environment, Mine Engineering, Water Infrastructure & Design – Senior Civil Engineer

CAREER SUMMARY

Johan is a Senior Civil Engineer conducting civil and storm water modelling and design for mining and industrial client sectors. Johan's passion lies in bringing his broad technical coordination for integrated projects related to storm water and associated infrastructure to bear to influence project planning and improve sustainability across a range of sectors including Mining and Industrial clients.

Johan's main focus areas are: - civil design; technical review; support associated teams including construction supervision, licensing and permitting, closure and rehabilitation, transport and infrastructure, and properties and buildings; technical project management; business development; storm water management plans and models; provide technical support to junior staff; provide linkage between civil engineering team and water resources.

Countries of work experience include: - South Africa, Mozambique, Democratic Republic of Congo, Zambia, Botswana, Ghana, Guinea, Tanzania.

4 years with WSP

29 years of experience

Area of expertise

Civil Engineering Design

Mining & Industrial Storm Water Modelling & Design

Rehabilitation and Closure

Civil Engineering Support to: - construction supervision, licensing and permitting, closure and rehabilitation, transport and infrastructure, and properties and buildings

Technical Project Management

Business Development

Technical Review & Mentorship

Language

English – Fluent

Afrikaans – Fluent

EDUCATION

BSc. Eng (Civil), University of Cape Town, Cape Town

1996

ADDITIONAL TRAINING

Hydropower Development Course

2024

River Modelling using HEC-RAS (Free Surface Flow Modelling)

2023

GIS Applications for Water Engineers

2022

Planning Strategic Feasibility Studies: An Engineers Perspective

2021

Scientific Report Writing

2019



Johan Jordaan

Earth & Environment, Mine Engineering, Water Infrastructure & Design – Senior Civil Engineer

WRSM/Pitman and WR2012 Website Information System	2018
Trans-Disciplinary Approach to Predictive Waste Assessment of Mining Residue Facilities under the 2015 NEM:WA Regulations	2016
Using Risk and Reliability Tools in Geotechnical Engineering	2016
Stainless Steel in Structural Engineering	2016
Leadership & Management Principles & Practice in Engineering	2016
Water Law SA	2015
Tailings Training Course	2014
Mining Project Life Cycle – Social Management Services	2013
Mining Project Life Cycle – Sustainability and Climate Change	2013
Permitting	2013
Pertinent Aspects of Waste Management and Related Legislation	2013
Modelling of Free Surface Flow and Dam Break Analysis	2012
Project Management Fundamentals	2012
Tailings and Mine Waste Management	2010
First Aid Level 1	2009
Autodesk Civil 3D Essentials	2009
Project Management 24	2006
Project Sustainability Management	2006
Introduction to Financial Management	2006
First Aid Level 1	2006
Handling Projects in a Consulting Engineer's Practice	2005
Civil Designer: - Design Centre	2004
Civil Designer: - Water	2004
Introduction to Project Management	2004
South African Road Traffic Signs Manual Awareness Workshop	2003
PC DOCS DOCS Open User	2001
AutoCAD R2000 Level 1	2001
AutoCAD R2000 Level 2	2001
Junior Management Course	1997
STARDUST	1997
Transformation Workshop	1997
MS Project 4 for Windows	1997



Johan Jordaan

Earth & Environment, Mine Engineering, Water Infrastructure & Design – Senior Civil Engineer

PROFESSIONAL MEMBERSHIPS

ECSA – Professional Engineer (Pr Eng) Engineering Council of South Africa (20080244)	2008
MSAICE – South African Institution of Civil Engineers (204540)	2004
MWISA – Water Institute of South Africa (23049)	2004

PROFESSIONAL HISTORY

WSP Group Africa (Pty) Ltd.	July 2021 – present
Golder Associates Africa (Pty) Ltd	September 2002 – June 2021
Wates, Meiring and Barnard Consulting Engineers (Pty) Ltd – Midrand	September 2001 – August 2002
National Department of Water Affairs and Forestry – Pretoria	April 1998 – August 2001
National Department of Transport – Pretoria	January 1997 – March 1998

PROFESSIONAL EXPERIENCE

McCain Foods South Africa, Delmas Factory, Storm Water Management Plan for Expansion of Factory Water Treatment Plant, Delmas, Mpumalanga, South Africa 2025

Civil Engineer – Engineering Manager

Prepare a storm water management plan for the expansion of the water treatment plant at McCain Foods SA, Delmas.

Debswana Diamond Company, Orapa, Letlhakane, and Damtshaa Mines (OLDM), Flood Risk Modelling and Recommendations, Central district, Botswana 2025

Civil Engineer

Conduct 1D-2D flood risk modelling for OLDLM and provide recommendations to address risks and provide a conceptual cost estimate. Modelling using outputs from accompanying climate change studies.

Eskom Generation, Medupi Power Station, Conceptual Storm Water Management Upgrade Modelling and Design, Lephalale, Limpopo, South Africa 2025

Civil Engineer – Engineering Manager

Storm water rainfall-runoff modelling and conceptual engineering design. Included retrospective modelling of the existing system and tie-in of all recommendations.

Mopani Copper Mines PLC, Nkana Tailings Storage Facility, Flood Risk Modelling, Kitwe, Zambia 2025

Civil Engineer

1D-2D flood risk model to determine locations of potential overtopping of the course underflow embankment during the 1:10,000-year 72hour storm event.

South32 Metalloys, Meyerton, Storm Water Management Diversion Modelling and Detail Design, Gauteng, South Africa 2025

Civil Engineer

Modelling and detail design of plant area runoff from a footprint in care and maintenance, to divert runoff past Amcor Dam to Fouriespruit, to allow rehabilitation of Amcor Dam.



Johan Jordaan

Earth & Environment, Mine Engineering, Water Infrastructure & Design – Senior Civil Engineer

**Glencore Tweefontein Coal Mine, Storm Water Management Audit, Mpumalanga, South Africa
2024-2025**

Civil Engineer

Integrity audit of storm water management infrastructure for water use licence consolidation application

**Ivanplats Platreef, Storm Water Management Model, Limpopo, South Africa
2024**

Civil Engineer

Storm water management model for the design of the Rietfontein tailings storage facility, comprising clean storm water diversion and management of phased tailings storage facility development storm water management.

**Kamoa Copper SA, Kamoa and Kakula, Storm Water Management and Flood Risk Management
2024**

Civil Engineer

Kakula and Kamoa storm water management modelling and design. Floodlines pre- and post-development of Kakula and also Kamoa TSF.

**Sasol Secunda Operations, Secunda, Mpumalanga, South Africa, Storm Water Master Plan and GN704
Audit
2024**

Civil Engineer

Prepare a storm water management master plan for Sasol Secunda Operations including Polymers and Nitro.

**RioTinto Simandou Mine, Bulk Earthworks Storm Water Management, Guinea
2022 - 2024**

Civil Engineer

Detail site-wide storm water planning and modelling. Infrastructure design. 1D-2D flood risk modelling. Member of a highly integrated multi-disciplinary design team and project.

**Glencore Tweefontein Colliery, Storm Water Management, Mpumalanga South Africa
2022**

Civil Engineer

Site assessment, storm water modelling, planning of storm water management infrastructure and management solutions for clean and dirty storm water separation at 13 sites across the north and central mine.

**Debswana Jwaneng Mine, Storm Water Management, Botswana
2022**

Civil Engineer

Pit storm water management modelling and assessment of management options. Engineering manager for surface storm water modelling and management options.

**Glencore PLC Mutanda Mining (MUMI), Ground and Surface Water Studies – Sulphide and Oxide
Phases, Katanga, Democratic Republic of the Congo
2022**

Civil Engineer – storm water management and modelling

Prepare site-wide storm water management plan.

**Anglo Coal SA, Khwezela Bokgoni Colliery, Mpumalanga, South Africa
2021 – 2022**

Civil Engineer – storm water

Site-wide storm water planning and modelling, and detail engineering design of selected infrastructure.

Ivanplats Kamoa Copper, Environmental Support Services – River Flood Studies Update, Democratic Republic of the Congo (DRC)



Johan Jordaan

Earth & Environment, Mine Engineering, Water Infrastructure & Design – Senior Civil Engineer

2021 – 2022

Civil Engineer

Development of several pre- and post-development floodlines and flood peak determinations to inform mine infrastructure planning and design.

Debswana OLD Mines, Storm Water Management, Botswana

2021 – 2022

Civil Engineer

Detail site-wide storm water planning and modelling for Orapa Mine and Township, Letlhakane Mine and Damtshaa Mine. Review of civil engineering designs by others.

Phola Coal, Detail Design of Seepage Management System, Mpumalanga South Africa

2021 – 2022

Civil Engineer

Conceptual planning and design, geotechnical evaluation and detail design of seepage management system for Phola Coal South Dam.

Glencore Tweefontein Colliery, Water Use Licence Consolidation, Mpumalanga South Africa

2021

Civil Engineer

Site assessment of surface water infrastructure and preparation of WUL consolidation report.

Glencore, Impunzi Water Use Licence Consolidation, Mpumalanga, South Africa

2021

Civil Engineer – Integrity Audit

Part of a multi-disciplinary specialist team. Tasked to assess current water uses relating to surface water management infrastructure, pursuant to consolidating and extending current water uses. Site assessment and specialist rating and reporting.

South32 Rietspruit Colliery, Environmental Studies Permit Process, Mpumalanga, South Africa

2021

Civil Engineer – Storm Water

Part of specialist team with a focus on storm water status and storm water aspects relating to proposed future land uses and remaining un-rehabilitated areas, as well as status of previously rehabilitated mining areas.

Samancor Tubatse Smelter, Conceptual design of site-wide storm water system, South Africa

2021 – 2022

Civil Engineer

Engineering manager for site assessment, storm water model and conceptual design of site-wide storm water management system

Goldfields, TSF5 Annex Design, Tarkwa, Ghana

2020

Civil Engineer – storm water

Detail storm water modelling for design of TSF including routing of excess water and sizing of TSF Spillway.

Impala Platinum, Storm water management modelling, Springs, Gauteng, South Africa

2020

Civil Engineer – storm water

Storm water management modelling for all company property around the Plant periphery, including legacy tailings footprint. To assist client with storm water planning and investment planning.

Grindrod Terminals, New Pollution Control Dam and storm water, Kwa-Zulu Natal, South Africa

2020

Civil Engineer – conceptual designs and storm water modelling



Johan Jordaan

Earth & Environment, Mine Engineering, Water Infrastructure & Design – Senior Civil Engineer

Conceptual engineering design of new Pollution Control Dam, storm water and related infrastructure including storm water modelling and infrastructure sizing.

Ivanhoe Mines Ltd, Floodlines and Storm Water Management, Kakula, Kolwezi, Democratic Republic of the Congo

2020

Civil Engineer – storm water and floodlines

Floodlines and storm water management planning.

Acacia Bulyanhulu Mine, Conceptual Design and Costing - dam lining, Bulyanhulu, Tanzania

2020

Civil Engineer – storm water management and modelling

Conceptual engineering for dam liners, including technical memo and costing

Glencore, ARM Goedgedvonden Colliery, Mpumalanga, South Africa

2019

Civil Engineer – Floodlines and River Diversion Maintenance

Prepare floodlines for various streams and river diversions on the mine and prepare a river diversion maintenance manual.

Mutanda Mining S.A.R.L, Site-wide Storm Water Management, Katanga, DRC

2019

Civil Engineer – site assessment and storm water modelling

Detail storm water modelling for site-wide storm water management of clean and dirty runoff.

Managem, Tri-K Project, Mandiana, Guinea

2018

Civil Engineer – Storm Water

Storm water modelling for sizing spillways of Attenuation Dam and Return Water Dam, outflow channel from Attenuation Dam as well as pit diversion berms. 2D flood model to determine water depth around pit and downstream pipe crossing, as well as flow velocity in these areas, and to determine flood inundation limits in infrastructure areas.

South32, Wolwekrans Colliery and Ifalethu Colliery, Mpumalanga, South Africa

2018

Civil Engineer – Storm Water

Detail storm water modelling and conceptual design of various storm water management interventions to improve clean and dirty water management across the operation.

Twinsaver Group, Floodline Determination, Kliprivier, Gauteng, South Africa

2018

Civil Engineer – floodline modelling

Floodline determination

Tenke Fungurume Mining (TFM), TFM Northwest TSF, Katanga, Democratic Republic of the Congo

2017 – 2019

Civil Engineer – Storm water

Storm water management plan for Kwaterbala and Northwest TSFs.

Enel Green Power, Ngonye Solar PV Plant, Lusaka South, Zambia

2017

Civil Engineer – 1D-2D flood modelling and storm water infrastructure planning and design

1D-2D flood modelling and storm water management modelling for new Solar PV plant.

McCain Foods, Storm water management plan, Mpumalanga, South Africa

2017

Civil Engineer – hydrology, hydraulics and design



Johan Jordaan

Earth & Environment, Mine Engineering, Water Infrastructure & Design – Senior Civil Engineer

Prepare tender designs for conveyance of water discharged from plant areas. Includes runoff modelling, hydraulic calculations and civil engineering design.

Yanfolila, TSF conceptual design, Yanfolila, Mali

2017

Civil Engineer – storm water management, spillway hydrology and hydraulics

Conduct runoff calculations and sizing of storm water interception/diversion works and flood peak for Phase 1 and Phase 2 TSF spillway.

Vanchem Vanadium Products - Detail Design of Calcine Disposal Facility Extension, Mpumalanga, South Africa

2017

Civil Design Lead

Detail civil engineering design of extensions to lined calcine disposal facilities and storm water pond. Included role of project manager and design lead. Presentation to Department of Water and Sanitation. Tender process and technical tender evaluation.

McCain Foods Delmas, Conceptual Storm Water Management, Mpumalanga, South Africa

2017

Civil Engineer

Upgrades and improvements to Oil Offloading Area to keep oil spills out of storm water, and general surface water management interventions.

Konkola Copper Mine PLC, Environmental Studies, Chingola, Zambia

2016

Civil Engineer – site assessment and environmental protection measures

Environmental storm water planning

South32 Metalloys, Site-wide storm water management, Gauteng, South Africa

2015

Civil Design Engineer and Storm Water Management

Storm water management detail civil engineering design. Office support during construction.

Vale Moatize Coal, Conceptual and Detail Design Phases, Tete, Mozambique

2015

Civil Engineer

Detail design of all aspects relating directly to the waste and product stockpiles including platform design, drainage design, consideration of spontaneous combustion, modelling, leachate management.

Vanchem Vanadium Products, Options Analysis for Next Phase Development, Ferrobank, Mpumalanga, South Africa

2015

Civil Engineer

Conduct an options analysis for determining the optimal extension of the calcine dump, based on the conceptual design. Project elements included PCD sized for 3 options, capacity analysis and cost estimate for development (capital).

Steyn City Estate, Development, Gauteng, South Africa

2014

Civil Engineer

Develop concepts for the construction of a weir across the Jukskei River, for water use licence and environmental approval.

Vanchem Vanadium Products, Remaining Capacity Analysis, Ferrobank, Mpumalanga, South Africa

2014

Civil Engineer



Johan Jordaan

Earth & Environment, Mine Engineering, Water Infrastructure & Design – Senior Civil Engineer

Determination of remaining airspace volume and life of facility, using aerial survey and by estimating average deposition rates.

Msobo Coal, Pollution control dam - Integrated Water Use Licence Application, Mpumalanga, South Africa

2014

Civil Engineer

Prepare conceptual details of pollution control dam for support of IWULA. Present to Inkomati Catchment Management Agency.

Vale Moatize Coal, Product Stockpile, Run of Mine Stockpile and Waste Dump, Tete, Mozambique

2014 – 2015

Civil Engineering Reviewer

Provide professional review capacity for engineering development of dumps.

Vale Moatize Coal, In-Pit Disposal, Tete, Mozambique

2013

Civil Design Engineer

Conduct design of in-pit disposal of coarse rejects and waste rock mine waste streams.

Anglogold, Ashanti West Wits Mponeng Shaft PCD Upgrade, Gauteng, South Africa

2013

Role

Design of new PCD including upgrade of surface water collection system, earthworks, liners, ancillary works etc. To tender level. Includes engineering drawings, specifications, schedule of quantities and cost estimate.

Vanchem Vanadium Products, Permitting of Course Tailings Facility, Mpumalanga, South Africa

2010

Civil Engineer

Design of infrastructure for a new calcine disposal and slimes disposal facility for Vanchem, various infrastructure including earthworks, liners and PCD works.

Waterval Domestic, Waste Facility, Rustenburg/Limpopo, South Africa

2010

Civil Engineer

Design of all aspects of waste domestic waste disposal facility for Rustenburg Local Municipality including services, earthworks, liners and water management.

BHP Billiton Energy Coal SA Limited, Rietspruit Mine Rehabilitation, Mpumalanga South Africa

2010

Civil Engineer

Member of design team responsible for ongoing design, site assessments, designer input to quality assurance and ongoing construction team support. An EPC type project.

Vale, Moatize TSF Design, Tete, Mozambique

2009 – 2010

Civil Engineer

Aspects relating to infrastructure design for new coal mining development in Tete, Mozambique, including storm water management for the TSF, return water collection and pumping and domestic waste site.

SAPPI Ngodwana, Design of Macrodump Extension, South Africa

2009

Civil Engineer

Prepare detail design of the macrodump extension at SAPPI Kraft Mill in Ngodwana, Mpumalanga, South Africa. Included earthworks, storm water, cell liners, access, separation systems and ancillary works. Lead in design team.

Johan Jordaan

Earth & Environment, Mine Engineering, Water Infrastructure & Design – Senior Civil Engineer

**Goldfields Kloof Mine, Design and Upgrading Kloof Return Water Dams, Carletonville, South Africa
2009**

Civil Engineer

Design, tender and site assistance for construction of upgrades to Kloof Plant 1 and Plant 2 return water dams

**Exxaro Coal (Matla), Matla Mine Goaf Storm Water Management, Ogies, South Africa
2009**

Civil Engineer

Remediation design in terms of drainage, involvement also in tender and site assistance aspects.

**Amoma Mine, Amoma Pit Mining Infrastructure Stage 4, Ghana, Ghana
2009**

Civil Engineer

Detail design of storm water management and ancillary works, remote site support and ongoing design and testing input during the construction phase, assistance in materials procurement and manufacturing. Member of design team.

**Anglo American Thermal Coal, EIA EMP Waterberg Coalbed Methane Project, Waterberg Degassing Project, South Africa
2008**

Civil Engineer

Conceptual Engineering Design of infrastructure related to the energy from gas project including earthworks, storm water and separation, services and ancillary works.

**BHP Billiton Energy Coal SA Limited, Middelburg Mines - Mine Water Reclamation Facility, South Africa
2008**

Civil Engineer

Conceptual Engineering Design for the Waste Disposal Facilities (sludge and brine) and ancillary works.

**Anglo Coal, Greenside Colliery Dam and Pumpstation, Mpumalanga, South Africa
2008**

Civil Engineer

Design and tender involvement for new return water dams and associated infrastructure at Greenside Colliery.

**BHP Billiton Energy Coal SA Limited, Optimum Mine Water Reclamation, Middelburg, South Africa
2008**

Civil Engineer

Tender Design Stage - analysis and design for raw water abstraction works, gravity pipeline to water reclamation plant and intake tower.

Construction Design Stage: - design and tender involvement for sludge and brine disposal facility and associated works, as well as part-time site supervision.

**Goldfields, Beatrix Mine, Virginia, South Africa
2008**

Civil Engineer

The closure and rehabilitation cost estimate and report were prepared for four shafts and two gold plants of the mine. This included on-site assessment of closure components and preparation of closure cost in line with regulatory guidelines and requirements.

**Amoma Mine, Amoma Pit Mining Infrastructure Stage 4, Ghana, Ghana
2008 – 2009**

Civil Engineer

Conceptual design and costing assistance for storm water management, and environmental protection measures for proposed Amoma mine in Ghana.



Johan Jordaan

Earth & Environment, Mine Engineering, Water Infrastructure & Design – Senior Civil Engineer

**ASA Metals, Detail Design and Construction Supervision of Storm Water Infrastructure and Pollution Control Dams, South Africa
2007**

Civil Engineer

Relating to the construction of infrastructure for ASA Metals mine and smelter including storm water, sewer and water supply.

**Exxaro Coal (Matla), Matla River Diversion, Mpumalanga, South Africa
2007**

Civil Engineer

Design, tender and site supervision for construction of river diversion of the Rietspruit River for Matla Mine III.

**AngloGold Ashanti Limited, Legacy Rehabilitation Sites Assessment, West Wits and Orkney, South Africa
2006**

Civil Engineer

Conduct rehabilitation planning for eleven sites on the AngloGold Ashanti Limited West Wits and Vaal River operations. This involved extensive site reconnaissance, project management and reporting. The deliverables were eleven rehabilitation planning reports which incorporated situational descriptions of the sites and rehabilitation plan. Detailed cost estimates for implementation were also provided.

**Highveld Steel and Vanadium Corporation, Mapochs Mine, Roosenekal, South Africa
2006 – 2007**

Civil Engineer

The closure and rehabilitation cost estimate and report were prepared for the plant and opencast mining areas of the mine. This included on-site assessment of closure components and preparation of closure cost in line with regulatory guidelines and requirements.

**De Beers, Finsch Mine, Lime Acres, South Africa
2006 – 2007**

Civil Engineer

The project involved the engineering design, specification and tender process of the mechanical and civil components of the return water system, including a barge pump system, a return water pump station and return water pipeline.

**Sappi Ngodwana Mill, Sappi Ngodwana Eye Water Investigation, Ngodwana, South Africa
2005**

Civil Engineer

The project entailed collection of spring (“Eye”) water, transfer to treatment facilities, and distribution. Personal involvement included collection system, plant layout and distribution in the disciplines of pumping, piping and civil works. The project was done at the level of preliminary design and cost estimate.

**Olifantsvlei Water Treatment Plant, Olifantsvlei Dam, Johannesburg, South Africa
2005**

Civil Engineer

Conducted a water hammer analysis for the new sludge pump station and pipeline system.

**Sappi Ngodwana Mill, Effluent Reduction Project 1, Ngodwana, South Africa
2004**

Civil Engineer

As a member of a multi-disciplinary team, conducted Civil and Piping design for the Effluent Reduction Project Phase 1: Distribution System. The work involved upgrading the mill treatment plant, recycling process water to a new reservoir and distributing the water back into the mill process. Personal involvement included industrial site investigation in brown field's conditions, rising main analysis and design, pump selection, reticulation design and water hammer analysis.

Johan Jordaan

Earth & Environment, Mine Engineering, Water Infrastructure & Design – Senior Civil Engineer

Sunderland Ridge Wastewater Works, Management of Wastewater and Sludge, Centurion, South Africa 2004

Civil Engineer

Initiated layout and design of civil work (hydraulics) for the new anaerobic digester facility.

Kimberley Diamond Mine, Storm Water Management Plan, Kimberley, South Africa 2004

Civil Engineer

Conducted preliminary design of roads and potable water diversion for the new rock dump facility at Kimberley Diamond Mine.

Kingston Vale, Hazardous Waste Disposal Site, Nelspruit, South Africa 2004

Civil Engineer

Was member of a design team; design of main and secondary access roads, relocation of farm irrigation, dust suppression and water services for farm labourers.

Extensions to Mothotlung WWTP, Full Time Site Supervision, Northwest Province, South Africa 2002 – 2003

Civil Engineer

Was appointed Resident Engineer for full time site supervision during the construction phase of the Wastewater Treatment Plant at Mothotlung Township.

Sadiola Gold Mine, Treatment Works, Western Mali 2001

Civil Engineer

Design review and buoyancy calculations.

King Dinizulu, Effluent Treatment Plant, Eshowe, South Africa 2001

Civil Engineer

Was involved in aspects of detailing and design for the plant layout and biological reactor.

Zheng Yong Garment Factory, Effluent Treatment Works, Swaziland 2001

Civil Engineer

Was tasked with drawing and design for the pumping, piping and civil structure for the Sand Filter Installation at the water treatment works for the garment factory.

Ephes Mamkele Primary School, Detail Design, Wattville, South Africa 2001

Civil Engineer

Was involved in detailing and design for various aspects of the school layout and facilities, including management of storm water.

Kgolagano Primary School, Detail Design, Benoni, South Africa 2001

Civil Engineer

Was involved in detailing and design for various aspects of the school layout and facilities, including management of storm water.

Luvuvhu River G.W.S., Pipe Junction Box Structural Design, Luvuvhu WMA, South Africa 1998 – 2001

Junior Civil Engineer

Tasked with reinforcement and detailing for a concrete pipe junction box.

Spring Grove Dam, Stability Analysis, Mooi River, South Africa



Johan Jordaan

Earth & Environment, Mine Engineering, Water Infrastructure & Design – Senior Civil Engineer

1998 – 2001

Junior Civil Engineer

Conducted a 2D stability analysis for earthquake loads using a DOS based analysis package and confirmed results using a commercially available module. The work was conducted for an in-house client for whom a letter was drafted to report on the findings of the analysis.

Finite Element Analysis, Various, South Africa

1998 – 2001

Junior Civil Engineer

Conducted Finite Element Analysis and prepared Analysis Reports for the following dams and structures:

Welbedacht Dam

Thabina Dam

Dasbos Tunnel Plug

Lindleyspoort Dam

Pongolapoort Dam

Der Brochen Dam Intake Tower

Oukloof Dam

National Route 1, Hex River Pass, Western Cape, South Africa

1997-1998

Junior Civil Engineer

Was tasked with the preliminary design and cost estimate for geometric improvements to “Spookdraai” on National Route 1, known for accidents due to “hairpin bend”, particularly amongst heavy vehicles.

National Route 10, Section 3, Cradock, South Africa

1997

Junior Civil Engineer

A portion of the N10 Section 3 passes by a stretch of rock face immediately adjacent to the roadway. A history of rock falls and increasingly unstable conditions in the rock face required planning and development of remedial measures, preliminary design and costing and selection of alternatives. Formed part of the Design Team involved in this project.

PUBLICATIONS / CONFERENCES

Conference Proceedings

Jordaan, Johan and Francois Marais, 2014. The Vanchem Waste Disposal Facility, A phased Development Approach of a Vanadium Hazardous Waste Site. SAICE 5th International Mining & Industrial Waste Management Conference, March 204, Rustenburg, SA