Appendix A:
Public Consultation Documents

1. Newspaper adverts
2. Public Meeting minutes
3. Communiques (letters, emails)

CAREERS

Tips to practice compassionate leadership

Embracing this management philosophy will help you become a better boss.

Daniel Bortz, Monster contributor In a world of bottom lines, virtual meetings, and ever-changing technology, it's key to show your humanity, especially as a leader. Managers at all levels of businesses can use compassion to effectively lead

The philosophy of compassionate leadership was pioneered by psychologist Jon Kabat-Zinn, who found that pairing these two traits helps reduce stress and improve organizational performance.

Compassionate leadership uses empathy to connect with employees on a deeper level and bring out their best work while also boosting their morale, an in-depth 2011 study from the Australian School of Business found.

Here are five ways you can practice compassionate leadership.

Embrace the three tenets of compassionate leadership

According to the Search Inside Yourself Leadership Institute, a global online training platform, there are three pillars of compassionate leadership: cognitive understanding, affective understanding, and motivational connection.

Cognitive understanding is having a firm grasp of the problems, situations, and decisions that your employees face. From bereavement leave to new parent leave, make sure your benefits address the realities of your workers' lives.

Affective understanding is keeping your pulse on how your team feels emotionally. Are they stressed? Are they bored? Are they engaged in the projects they're working on? Ask them questions, and be aware of their moods and behaviors.

Motivational connection is demonstrating to your team that you want them to succeed and that you have their best interests at heart. Really look for ways you can help them accomplish their career goals.

Combined, these three behaviors will enable you to create a team that's united around a shared mission.

Lead mindfulness exercises

Kabat-Zinn is a big believer of mindfulness, a type of meditation where you focus intensely on what you're sensing and feeling in the moment—and studies show mindfulness can reduce aggression, anxiety, irritability, and anger. Practicing mindfulness with your team can also decrease burnout.

Body scan meditation. "Lie on your back with your legs extended and arms at your sides, palms facing up," the clinic's website says. "Focus your attention slowly and deliberately on each part of your body, in order, from toe to head or head to toe. Be aware of any sensations, emotions or thoughts associated with each part of your body."

Sitting meditation. "Sit comfortably with your back straight, feet flat on the floor and hands in your lap. Breathing through your nose, focus on your breath moving in and out of your body. If physical sensations or thoughts interrupt your meditation, note the experience and then return your focus to your breath."

Walking meditation. "Find a quiet place 10 to 20 feet in length, and begin to walk slowly. Focus on the experience of walking, being aware of the sensations of standing and the subtle movements that keep your balance. When you reach the end of your path, turn and continue walking, maintaining awareness of your sensations."

Become self-aware

Compassionate leaders don't just guide their employees—they lead by example. That means being receptive to feedback on your own performance, measuring up to the standards that you set for your team, finding meaning in your work, and building meaningful relationships with your co-workers. Carrying out these actions will show your team how to follow in your footsteps.

Lead with humor

Showing that you're a human being, and not just a boss, will help your employees relate to you and recognize your compassion. You can do that using humor. In a study by the Bell Leadership Institute, employees asked to describe the strengths of their senior colleagues mentioned "sense of humor" twice as much as any other phrase, along with "work ethic." That aligns with a study published in the Leadership & Organization Development Journal that found employees who said their manager "makes us laugh at ourselves when we are too serious" or "uses humor to take the edge off during stressful periods" were more likely to trust their boss and feel a sense of belonging at work.

Be a cheerleader, not just a coach

Compassionate leaders praise their employees on a regular basis. "Most managers only give feedback when it's negative or corrective, but they don't give out the good stuff nearly as much as they think they do," organizational psychologist Karlyn Borysenko told Monster. Her advice: "Give at least three pieces of positive feedback for every piece of negative feedback."

Don't go it alone

Compassionate leadership is an invaluable trait, and one that could get you noticed by many hiring managers at top companies. Could you use some more help with your professional development? Join Monster for free today. As a member, you'll get career advice, job search tips, and management trends delivered directly to your inbox. Learn how to be the leader you wished you had on your way up the ladder.

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Funções de serviços gerais, suporte às tarefas e atividades administrativas, condução de veículos, entrega de cartas e correspondências, limpeza, jardinagem, entre outras;

▪**Salário:**
NAD 7,000.00 (sete mil dólares namibianos) e seguro médico;

▪**Quem pode participar:**
Cidadãos namibianos ou estrangeiros que:
- Tenham pelo menos curso fundamental *("primary school")*,
- Disponham de carteira de motorista válida na Namíbia há pelo menos três anos;
- Saibam português, e
- Disponham de permissão para o trabalho na Namíbia por 45 horas semanais.

▪**Como se inscrever:**
http://windhoek.itamaraty.gov.br/pt-br/trabalhe_conosco.xml

▪**Período de inscrições:**
De 1 de março a 16 de abril de 2021

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BOOKING FEE R2500-00

GUARANTEED PLACEMENTS
CLOSING DATE 7 MARCH 2021

Property To Let/For Sale

Otjomuise Gardens Apartment
FOR SALE

2 bedroom with BIC
1 bathroom
Basement parking space for two cars
Price: N$ 670 000 transfer costs not included.
Call: 085 645 3083

Employment Wanted

A 33 years old male looking for employment.

Hold certificate in Early Childhood.

Able to volunteer around towns in Rundu, Windhoek and Divundu.

Call: 0818662192

A 48 year female in Windhoek is looking for ironing work, restaurant or school cleaning work.

Contact: 0813358258

Notices Legal Notices

GENERAL NOTICE

No 2021

PROSPERITA EXTENSION 1: ESTABLISHMENT OF THE TOWNSHIP – MUNICIPALITY OF WINDHOEK

Notice is hereby given in terms of Section 107(1) of the Urban and Regional Planning Act, 2018 (Act No. 5 of 2018), that application has been made for the establishment of the township **Prosperita Extension 1** situated on Erf 573, Prosperita and that the application is lying open for inspection at the Office of the Ministry of Urban and Rural Development: Division: Planning, 2nd Floor, Room No. 237, GRN Office Park in Windhoek, the Office of the Surveyor-General in Windhoek, and at the Office of the Chief Executive Officer, Municipality of Windhoek.

Any person who wishes to object to the application or who desires to be heard in the matter, may give personal evidence before the Urban and Regional Planning Board at the meeting of the Board which will be held on **21 April 2021** at **09:00** at the Offices of the Ministry of Urban and Rural Development in Windhoek, Decentralization Board Room or submit written evidence to the Urban and Regional Planning Board, Private Bag 13289, Windhoek: Provided that such written evidence shall reach the Secretary of the Urban and Regional Planning Board not later than **02 April 2021** before **12:00.**

L.D. UYEPA
CHAIRPERSON
URBAN AND REGIONAL PLANNING BOARD

NOTICE

ENVIRONMENTAL IMPACT ASSESSMENT AND PUBLIC PARTICIPATION PROCESS

Cuvepalm Consulting cc hereby gives notice to all potential Interested and Affected Parties (I&APs), that an application will be made to the Environmental Commissioner in terms of the Environmental Management Act (No. 7 of 2007) and the Environmental Impact Assessment Regulations (GN 30 of 6 February 2012) for the following:

Project Title: Proposed Witvlei Copper Smelter

Project Description: Construction and operation of a copper smelter plant.

Project Location: The proposed smelter is sited at Portion A of Farm Okatjirute No. 155, Witvlei - Omaheke Region: Namibia.

Proponent: New Horizon Investment Group Namibia.
I & APs are invited to partake in the EIA process and give their comments and concerns in writing. A public meeting will be held on Tuesday 16 March 2021 at Hoadadi Community Hall in Witvlei. Time 14:00 PM. The participation and commenting period is effective until 31 March 2021.

NB: COVID 19 REGULATIONS WILL BE STRICTLY FOLLOWED DURING THIS MEETING.

To further information, to confirm attendance at the above-mentioned meeting or and/or register as an I&AP please contact the Environmental Assessment Practitioner:

Mr Tendai E. Kasinganeti
Tel: +264 813634904
Email: ekasinganetie@gmail.com

Employment Offered

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Attach CV and qualifications.

Forward your application to: The Principal, PO Box 40101 Oshigambo or hand deliver Contact: 0818052089

Notices Legal Notices

GENERAL NOTICE

Rundu extension 34: ESTABLISHMENT OF THE TOWNSHIP – TOWN COUNCIL OF RUNDU

Notice is hereby given in terms of Section 107(1) of the Urban and Regional Planning Act, 2018 (Act No. 5 of 2018), that application has been made for the establishment of the township **Rundu Extension 34** situated on Portion 139 of the Remainder of the Farm Rundu Town and Townlands No. 1329 and that the application is lying open for inspection at the Office of the Ministry of Urban and Rural Development: Division: Planning, 2nd Floor, Room No. 237, GRN Office Park in Windhoek, the Office of the Surveyor-General in Windhoek, and at the Office of the Chief Executive Officer, Town Council of Rundu.

Any person who wishes to object to the application or who desires to be heard in the matter, may give personal evidence before the Urban and Regional Planning Board at the meeting of the Board which will be held on **21 April 2021** at **09:00** at the Offices of the Ministry of Urban and Rural Development in Windhoek, Decentralization Board Room or submit written evidence to the Urban and Regional Planning Board, Private Bag 13289, Windhoek: Provided that such written evidence shall reach the Secretary of the Urban and Regional Planning Board not later than **12 April 2021** before **12:00**.

L.D. UYEPA
CHAIRPERSON
URBAN AND REGIONAL PLANNING BOARD

GENERAL NOTICE

Rundu extension 35: ESTABLISHMENT OF THE TOWNSHIP – TOWN COUNCIL OF RUNDU

Notice is hereby given in terms of Section 107(1) of the Urban and Regional Planning Act, 2018 (Act No. 5 of 2018), that application has been made for the establishment of the township **Rundu Extension 35** situated on Portion 134 of the Remainder of the Farm Rundu Town and Townlands No. 1329 and that the application is lying open for inspection at the Office of the Ministry of Urban and Rural Development: Division: Planning, 2nd Floor, Room No. 237, GRN Office Park in Windhoek, the Office of the Surveyor-General in Windhoek, and at the Office of the Chief Executive Officer, Town Council of Rundu.

Any person who wishes to object to the application or who desires to be heard in the matter, may give personal evidence before the Urban and Regional Planning Board at the meeting of the Board which will be held on **21 April 2021** at **09:00** at the Offices of the Ministry of Urban and Rural Development in Windhoek, Decentralization Board Room or submit written evidence to the Urban and Regional Planning Board, Private Bag 13289, Windhoek: Provided that such written evidence shall reach the Secretary of the Urban and Regional Planning Board not later than **12 April 2021** before **12:00**.

L.D. UYEPA
CHAIRPERSON
URBAN AND REGIONAL PLANNING BOARD

GENERAL NOTICE

Rundu extension 36: ESTABLISHMENT OF THE TOWNSHIP – TOWN COUNCIL OF RUNDU

Notice is hereby given in terms of Section 107(1) of the Urban and Regional Planning Act, 2018 (Act No. 5 of 2018), that application has been made for the establishment of the township **Rundu Extension 36** situated on Portion 136 of the Remainder of the Farm Rundu Town and Townlands No. 1329 and that the application is lying open for inspection at the Office of the Ministry of Urban and Rural Development: Division: Planning, 2nd Floor, Room No. 237, GRN Office Park in Windhoek, the Office of the Surveyor-General in Windhoek, and at the Office of the Chief Executive Officer, Town Council of Rundu.

Any person who wishes to object to the application or who desires to be heard in the matter, may give personal evidence before the Urban and Regional Planning Board at the meeting of the Board which will be held on 21 April 2021 at 09:00 at the Offices of the Ministry of Urban and Rural Development in Windhoek, Decentralization Board Room or submit written evidence to the Urban and Regional Planning Board, Private Bag 13289, Windhoek: Provided that such written evidence shall reach the Secretary of the Urban and Regional Planning Board not later than 12 April 2021 before 12:00.

L.D. UYEPA
CHAIRPERSON
URBAN AND REGIONAL PLANNING BOARD

Liverpool scramble for answers as season collapses

Mohamed Salah's angry shake of the head after being substituted in Liverpool's defeat to Chelsea was symbolic of the champions' intense frustration as their season unravels.

Jurgen Klopp removed his top scorer just after the hour mark on Thursday but it did not prevent a 1-0 defeat and a fifth straight home loss for the first time in their history.

The wheels have come off quickly for Liverpool, who were crowned English champions last season for the first time since 1990.

As recently as mid-January, Klopp's men were top of the league and in the title picture despite being hampered by a spate of injuries, most notably to central defender Virgil van Dijk.

Up until their shock 1-0 defeat to Burnley in January they had not tasted defeat in the league at Anfield since April 2017.

But now they have a fight on their hands just to qualify for the top four – an unthinkable situation after winning the title last year by 18 points.

Liverpool have earned just 10 points from 11 Premier League games in 2021, with only West Brom, Newcastle and Southampton picking up fewer points since the turn of the year.

They are in seventh place in the Premier League and four points behind fourth-placed Chelsea ahead of Sunday's match against lowly Fulham.

BLAME GAME

Klopp played down Salah's angry reaction after taking off the Egypt international as Liverpool trailed after Mason Mount's goal late in the first half.

"When the boys look disappointed it is not a problem. I didn't see what Mo did," he said. "The reason for the sub was that, and I could have changed other players as well that's true, but he looked in that moment that he really felt the intensity and I didn't want to risk him."

Klopp took the blame for the lacklustre defeat, in which his side's one shot on target was not registered until the 85th minute.

"These games are decided in moments and to get these moments back you have to fight and sometimes at a different level," he said. "It's not about tactics. It's about being resilient and heart.

"We won't blame the circumstances. There is only one person to criticise. That is me and us. That is what I told the boys."

Liverpool have been hampered by long-term injuries to not just Van Dijk but his fellow central defenders Joe Gomez and Joel Matip, which have in turn destabilised the rest of the team.

But their world-class trio of attackers – Salah, Roberto Firmino and Sadio Mane have also lost their cut and thrust at an Anfield emptied of supporters by the coronavirus pandemic.

Liverpool have not scored from open play at home since late December, when Mane found the net against West Brom – a stark contrast to their swashbuckling form last season.

Left-back Andy Robertson urged his teammates to show some mettle in order to save their season.

"Too many heads are going down when we go 1-0 down, we can't do that," Robertson said. "Football is about taking knocks.

"We can't rely on the past. Last season is over with, it is done. We have been nowhere near good enough to what a Liverpool team should be. We are dropping further and it is not good enough."

Liverpool could start to turn it around against Fulham but Scott Parker's men are battling for their Premier League lives.

The stark truth is that no game looks easy for Klopp's men at the moment as they try to recapture the magic that has vanished.

GOSSIP

Arsenal are among a number of clubs considering a summer move for RB Leipzig's 21-year-old French defender Ibrahima Konate. (Standard).

Konate is one of six deals the Gunners are working on, with the club also willing to sell France striker Alexandre Lacazette, 29, for the right price. **(Football. London)**

Manchester City manager Pep Guardiola is a long-term admirer of Aston Villa and England's 25-year-old midfielder Jack Grealish, but the Premier League leaders are set to focus on signing a deeper-lying midfielder - as well as a striker and left-back - in the summer. **(Mirror)**

Manchester United's Portugal midfielder Bruno Fernandes, 26, is set to sign a new contract that will double his wages to around £200,000 a week. **(Sun)**

Leicester City are close to clinching a £15m deal for Celtic's 23-year-old French forward Odsonne Edouard, who Foxes manager Brendan Rodgers sees as a long-term replacement for 34-year-old former England striker Jamie Vardy. **(Mail)**

Egypt defender Ahmed Elmohamady, 33, will leave Aston Villa on a free transfer in the summer as the club have no plans to offer him a new deal. **(Football Insider)**

Sheffield United manager Chris Wilder's position is under serious threat. The Englishman and Blades owner Prince Abdullah are disagreeing over the club's transfer policy and the hierarchy's plan for a director of football. **(Mail)**

Napoli have reduced their asking price for Kalidou Koulibaly to around 45m euros (£38.7m), with Bayern Munich believed to be ahead of Liverpool and Manchester United in the race for the 29-year-old Senegal defender. **(Il Mattino - in Italian)**

Manchester United are looking for an alternative club for midfielder Andreas Pereira, 25, this summer because Lazio are not expected to take up the option to turn the Brazilian's loan into a permanent deal. **(Corriere Dello Sport - in Italian)**

Leicester City have renewed their interest in long-time target Ismail Jakobs, 21, but the Foxes face competition from Brighton who are also monitoring Cologne's Germany Under-21 international. **(Mail)**

Financial pressures could force Valencia to sell 24-year-old Portugal forward Goncalo Guedes, who is a West Ham target, in the summer. **(O Jogo, via Sun)**

Juventus have identified Chelsea midfielder Jorginho, 29, as a 'Plan B' option if they fail to sign fellow Italy midfielder Manuel Locatelli, 23, from Sassuolo. **(Calciomercato - in Italian)**

Meanwhile, Juve's in-demand 19-year-old Romanian defender Radu Dragusin, who was previously linked with a move to Crystal Palace, is set to sign a new deal with the Turin club. **(Goal)**

CLASSIFIEDS

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Notices – Legal Notice

PUBLIC NOTICE

NOTICE OF INTENTION TO APPLY FOR REZONING IN TERMS OF THE URBAN AND REGIONAL PLANNING ACT (ACT NO.5 OF 2018)

Please take note that **KAMAU TOWN PLANNING AND DEVELOPMENT SPECIALIST** has been appointed by the owner of Erf 1563 Kuisebmond to apply to the local authority of Walvis Bay to:

- Rezone Erf 1563 Kuisebmond, Orange Rough Street, Walvis Bay from 'Single Residential' with a density of 1:300m2 to 'General Residential' with a density of 1:100m2
- Consent to commence with construction while rezoning is in process.

Erf 1563 Kuisebmund is located in Walvisbay, suburb Kuisebmond, along Orange Rough Street. The respective Erf measures 500m2 and is zoned 'Single Residential' with a density of 1:300m2. The current zoning allows the property to have a dwelling unit as well as a subsidiary dwelling unit with consent uses of a home based business, rental unit, guest house, place of assembly and so forth as according to Table B of the Walvisbay Town Planning Scheme.

The proposed zoning and density (General Residential with a density of 1:100m2, meaning 1 dwelling unit per 100 square meters) will allow the owner to erect a total of 5 dwelling units in total as per Walvisbay Town Planning Scheme.

Please further take note that -

(a) the plan of the Erf or land lies for inspection at Room 101, of the offices of the local authority (Walvis Bay Municipality);

(b) any person having objections to the rezoning concerned or who wants to comment, may in writing lodge such objections and comments, together with the grounds, with the Chief Executive Officer Local Authority of Walvis Bay, and with the applicant within 14 days of the last publication of this notice, i.e. no later than 22 March 2021.

PUBLIC COMMENTS DEADLINE: 22 MARCH 2021

For more information and queries, kindly contact:

No. 04 Wagner street | Windhoek west |
c: +264 81 3290584
P.O. Box 22296 | Windhoek |
t: +264 61251975 | f: +264 61 304219 |
yeli@kamau-tpds.com w: www.kamau-architects.com

NOTICE

ENVIRONMENTAL IMPACT ASSESSMENT AND PUBLIC PARTICIPATION PROCESS

Cuvepalm Consulting cc hereby gives notice to all potential Interested and Affected Parties (I&APs), that an application will be made to the Environmental Commissioner in terms of the Environmental Management Act (No. 7 of 2007) and the Environmental Impact Assessment Regulations (GN 30 of 6 February 2012) for the following:

Project Title: Proposed Witvlei Copper Smelter

Project Description: Construction and operation of a copper smelter plant.

Project Location: The proposed smelter is sited at Portion A of Farm Okatjirute No. 155, Witvlei - Omaheke Region: Namibia.

Proponent: New Horizon Investment Group Namibia.
I & APs are invited to partake in the EIA process and give their comments and concerns in writing. A public meeting will be held on Tuesday 16 March 2021 at Hoadadi Community Hall in Witvlei. Time 14:00 PM. The participation and commenting period is effective until 31 March 2021.

NB: COVID 19 REGULATIONS WILL BE STRICTLY FOLLOWED DURING THIS MEETING.

To further information, to confirm attendance at the above-mentioned meeting or and/or register as an I&AP please contact the Environmental Assessment Practitioner:

Mr Tendai E. Kasinganeti
Tel: +264 813634904
Email: ekasinganetie@gmail.com

Notices – Legal Notice

NOTICE OF SALE IN EXECUTION

IN THE HIGH COURT OF NAMIBIA (MAIN DIVISION) HELD AT WINDHOEK

CASE NO: HC-MD-CIV-ACT-CON-2020/04463

In the matter between:

V.NHAU LAND SURVEYORS
PLAINTIFF/EXECUTION CREDITOR
and
OPUWO TOWN COUNCIL
EXECUTION DEBTOR/ DEFENDANT

In pursuance of a judgment in the above Honourable Court granted on **12TH DAY OF JANUARY 2021** and Writ of Execution dated **27TH DAY of JANUARY 2021** the following goods will be sold in execution on **WEDNESDAY** the **14th** day of **APRIL 2021** at **12H00** at **OPUWO TOWN COUNCIL, OPUWO, REPUBLIC OF NAMIBIA**

GOODS:

1. **1 X WHITE HINO TIPPER TRUCK WITH REG NUMBER N1717OP**
2. **1X WHITE TOYOTA BAKKIE D4D WITH REG NUMBER OPUWO3NA**
3. **1X WHITE HINO TIPPER TRUCK WITH REG NUMBER N1402OP**
4. **1X RED MERCEDES BENZ FIRE TRUCK WITH REG NUMBER N689OP**
5. **1X WHITE TOYOTA 2.0. WITH REG NUMBER N689OP**
6. **1X WHITE TOYOTA 2.0. N2408OP**
7. **1X SILVER TOYOTA COROLLA WITH REG NUMBER OPUWO1NA**
8. **1X YELLOW HYDROBLAST MACHINE WITH REGISTRATION NUMBER N2152OP**
9. **1X WHITE HYNO TRUCK WITH REGISTRATION NUMBER N1865OP**

TERMS: VOETSTOOTS AND CASH TO THE HIGHEST BIDDER

Dated at **OKAHANDJA** on this **17TH** day of **FEBRUARY 2021.**

ILENI GEBHARDT & COMPANY INC
LEGAL PRACTITIONERS FOR THE PLAINTIFF
CNR OF BRUNO TEMPLIN & MARTIN NEIB STREETS
OKAHANDJA
(REF: VNH1/0001)

Employment – Offered

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DRIVERS/WELDERS/MECHANICS/SECURITY GUARDS
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BOOK NOW TO SECURE YOUR SPACE
Email infocareermarketing@telkomsa.net
Web www.careermarketingint.com
BOOKING FEE R2500-00

GUARANTEED PLACEMENTS
CLOSING DATE 7 MARCH 2021

EMBAIXADA DO BRASIL

Seleção de Profissional

▪Vaga de auxiliar de apoio:
Funções de serviços gerais, suporte às tarefas e atividades administrativas, condução de veículos, entrega de cartas e correspondências, limpeza, jardinagem, entre outras;

▪Salário:
NAD 7,000.00 (sete mil dólares namibianos) e seguro médico;

▪Quem pode participar:
Cidadãos namibianos ou estrangeiros que:
- Tenham pelo menos curso fundamental (*"primary school"*),
- Disponham de carteira de motorista válida na Namíbia há pelo menos três anos;
- Saibam português, e
- Disponham de permissão para o trabalho na Namíbia por 45 horas semanais.

▪Como se inscrever:
http://windhoek.itamaraty.gov.br/pt-br/trabalhe_conosco.xml

▪Período de inscrições:
De 1 de março a 16 de abril de 2021

Employment – Offered

MEDICAL DOCTOR WANTED

Kaoko Medical Practice in Windhoek CBD is urgently looking for a qualified Medical Practitioner.

Requirements:
- Be registered by the HPCN as a Medical Practitioner
- At least 5 years post internship experience
- Be willing to work long hours

Forward CV to: **fabiolahembapu@yahoo.com**, alternatively the interested individuals can call me on 0815546606.

Due date: 12 March 2021

Education – In Take

St ANTONY UNIVERSAL COLLEGE

St. Antony Universal College

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EXCELLENT Learning Facilities, Qualified and Experienced Teachers.

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- Certificate & Diploma in Early Childhood Development (ECD)
- Certificate in Law

Tel: (061) 400 232
Cell: (+264) 81 885 4919
Email: admissions@auc.edu.na
Web: www.nul.edu.na
30. Simpson Street.
Windhoek West,
Windhoek

Services – General

SPCA – Adopt A Pet

DBV SPCA
Windhoek

Adopt a Pet

Open your heart to those in need. Give them a warm & loving home!

CALL THE SPCA ON:
061 238645
OR
0811244520

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SPCA Windhoek
FNB Account:
62247995915
Code: 281174

MINUTES

PUBLIC PARTICIPATION

Project Title: Construction and operation of proposed copper smelter plant at Witvlei

Date: 16 March 2021. **Time:** 14:00PM

Venue : Hoadadi Community Hall, Witvlei, Omaheke Region, Namibia

---

Acronyms

BID- Background Information Document

EIA - Environmental Impact Assessment

EMA- Environmental Management Act no 7 of 2007

EMP- Environmental Management Plan

I&APs- Interested and affected parties

WTC -Witvlei Village Council

NHIG- New Horizon Investment Group

1. INTRODUCTION

The meeting commenced at about 14h30. One hundred and seven (107) interested and affected parties (IAPs) registered to participate in the meeting. As per Covid19 protocols, measures had to be adopted. Only a limited number of I&APS had to partake in the session for the day. All the attendees signed an attendance register and were also given a BID with a query registration form for completion. Consequently, the meeting was done in a multilingual manner (English, Afrikaans and Khoikhoe).

2. MEETING

2.1 *Opening Remarks:*

Mr Mr Hendrik Muisoor officially opened the meeting.

2.2 *Purpose of meeting*:

Mr Martin Shikongo from Cuvepalm Consulting cc explained in detail the purpose of the meeting. During his presentation Mr Shikongo gave an insight on the EIA process. The role of interested and affected parties in terms of EMA (Act no 7 of 2007) was

explained to attendees. Mr Berend van Den Berg(The Managing Director of NHIG) was given an opportunity to give an overview of company profile, interest and status of undertakings in Namibia .

2.3 ***Questions and Answers Session***

The BID was used as basis for the question and answer session. The Majority of the questions were answered by representatives of NHIG(B. van Den Berg; B. Biwa; M. Liebenberg; D. Erasmus) and Cuvepalm consulting cc (M.Shikongo and T.Kasinganeti). Issues raised and corresponding answers were clustered as per the following Table.

Table 1: Comments and Responses

ISSUE CATEGORY	COMMENTATOR	COMMENT /QUERY/REMARK	RESPONSE
Trust in Political and Social Institutions			
a) Due diligence	Mr Robert Pack	What benefits does the project bring to the Witvlei community?	The project can be one of the economic driver of economic activities in Witvlei including employment creation being major
		How long has New Horizon been operational?	Global Smelters (SA) has ventured with New Horizons undertake the project in Namibia. The company has been operational since 2008, in places such as Upington, South Africa.
	Mr Gerrard Heiser	Where is the location of the mine?	The proposed mining area is about 25 km north of Witvlei. Mining will only commence one the exploration results have proven that it is economically viable to extract ore deposit.
		The community should be assured that the project will be realized. Please no false-empty promises to the community any longer.	Noted.
	Mr Gerson Goeieman	In future, how will the New Horizon ensure that Witvlei does not become a ghost town after the mining can no longer continue? I would propose that development committee be established to facilitate interactions with company management on matters of development concern	Noted
		Every development has its advantages and disadvantages.	Noted.
	Mr. Cruz	Where can we read more about the company and technology proposed?	Additional Information can be requested via e-mail. Information on Global Smelters can be accessed via the company website.
b) Utility Demands/Constraints	Mr Hart	What is the power demand on electricity and who will pay for these expenses	This would be a one (1) ton smelter with an electricity demand of 350 kw per hour. A backup power generator will be erected on site. Water consumption cost will be borne by NHIG
		What would the water consumption be?	The water demand is relatively low. No significant amount of effluent is expected.

	Mr G. Heiser	What is the risk to underground water resources? Witvlei is in close proximity to the White Nossob ephemeral river	All possible releases will be contained on site. The slag will be inert. The slag will be temporarily stored future beneficiation. The EMP will specify mitigation measures
	Mr Hart	My biggest concern is that no mine exist. How did you arrive to the conclusion of 3.8 million copper ore reserve? What methods were used for the analysis	
c) Local ownership/Equity	Mr Gerson Goeieman	In my opinion there are no job opportunities. The project present massive development opportunity for Witvlei. We can draw on the experience surrounding mine closures in Southern Africa. The community members as stakeholders should be part of this process as represented by development committee. The community should have unhindered access to development committee. My proposal is that the community be allotted the 5% share option and not to the WTC.	Based on the current shareholding proposal, the WVC has 5% .This would be a public private partnership arrangement.
	Mr Gerrard Heiser	The farmers around Witvlei understand the positive impact the project can have on the Witvlei community especially in terms of job creation, reduction in crime and poaching. Who will own the smelter?	NHIG will own and run the smelter
	Mr Robert Pack	How much will be invested in the smelter ?	The proposed one (1) ton smelter will cost U$ 4.5 million.
d) Cooperative governance	Ms Magdalena. Murangi	We want to see development in Witvlei. As a community we hope that various parties work together towards realizing the project	Noted
	Mrs Magdalena Mauri	It is the first time such a project of Smelter is being heard in the town, so it is welcomed indeed and it will surely bring opportunities in the town and it shall reduce theft and unemployment.	Noted
2. SOCIO-ECONOMICS			
e) Social uplift-ment	Mr Hart	How will this project ensure that the people of Witvlei receive firsthand opportunity?	The local leaders (Councilors) assured to support the project and would further ensure that community members are given priority in terms of opportunities. NHIG shall strive to maintain sound industrial relations in conjunction with community labor representatives. A clinic will be constructed to take care of the health needs of workers
	Mr Robert Pack	As a community we want to see that the planning process be done correctly .Is there a social uplifting plan?	A social uplifting plan will be shared with the WVC for input and review
	Mrs Hart	How many people from Witvlei shall be employed?	Approximately .40-60 employees.
f) Perceptions of risk, health, and safety	Mr Gerrard Heiser	Are there other parties who can independently verify all the information on the project?	Government bodies such as the Ministry of Environment, Forestry and Tourism can be contacted in this regard

	Mr Gerson Eiseb	I would suggest that the proponent create a trust account to cater for the health needs of the workers	Noted
	Ms Hart	What guarantees are there that the community won't be exposed to air emissions?	An off gas stack will be retrofitted to the cupola smelter. Emissions are expected to be insignificant at 100% operational efficiency (de-dusting).
	Mrs Magdalena Mauri	It is the first time such a project of Smelter is being heard in the town, so it is welcomed indeed and it will surely bring opportunities in the town and it shall reduce theft and unemployment.	Comment welcomed.
	Mrs Hart	-there are negative effects of the project and this should not be allowed if the negative impacts are present, such as pollutants, acid rain and unclean water.	The smelting process uses 98% of only clean oxides. No sulphides are used as compared to other conventional processes. The water demands on the smelter is relatively low. EMP will prescribe mitigation measures to curtail potential adverse impacts
	Mr Hart	What will happen to the sulphides?	
3. CONSIDERATION OF ALTERNATIVES	**COMMENTATOR**	**COMMENT /QUERY**	**RESPONSE**
g) Location	Ms Hart	Why was Witvlei hand picked?	Witvlei is in close proximity to the ore deposit and present a viable option for sourcing local work force
h) Issues related to alternative sources	Mr Cruz	What are the negative impacts presented by the smelter technology proposed especially in terms of emissions?	A cyclone will be erected to counter the effects of dust emissions.

4. CLOSURE

Closing remarks were made by Mr Martin Shikongo (Cuveplam Consulting cc) who further invited I&APS to submit written comments on or before 31 March 2021. Mr Shikongo also thanked the participants for their valuable inputs EIA registration forms were collected from the participants.

5. ADJOURNMENT

The meeting was adjourned at 16:00 pm

6. ANNEXURES:

6.1 Agenda

a) Opening
b) Introduction
c) EIA Process Cuvepalm Consulting cc
d) Timeliness –NHIG
e) Discussion Points
f) Meeting open for participation
g) Reses-30 minutes

h) Questions and Answers session
i) Final remarks
j) Closing Statements and Adjournment

6.2 Attendance register

.

CUVEPALM CONSULTING
"sustainability driven"

STAKEHOLDERS CONSULTATION REGISTER:

PROJECT : PROPOSED COPPER SMELTER PLANT AT WITVLEI, OMAHEKE REGION-NAMIBIA

Venue: Hoadadi Community Hall **Time: 14:00**

Date: 16 March 2021

NAME	Organisation/ Location	PHONE NUMBER	SIGNATURE
Gordon Goeieman	Becky Construction	0818440077	[signature]
Erastus Virore	[illegible]	0818806390	[signature]
Stanley Goagoseb	New Extension	0813889642	[signature]
Jerome Van wyk	witvlei	0817458782	[signature]
Elsie Eises	witvlei	0813920569	[signature]
Thomas Garseb	witvlei	0816575768	[signature]
Gerson Eiseb	witvle	0812246798	[signature]
Veronica L. Horaes	Witvlei pos 2	081 449 1519	[signature]
Nikodemus Namwandi	Witvlei	0812216810	[signature]
Silvia Naui-Gawases	witvlei	0817575907	[signature]
Johannes Reed	witvlei	0813421397	

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NAME	Organisation/ Location	PHONE NUMBER	SIGNATURE
Aysoc Eisel	Location	0817598002	[signature]
Selina Thekwane	Location	0817139040	[signature]
Selastika Eises	Location	0813984074	[signature]
Dina Eises	Location	0818108900	D Eises
Collen Tsuwaseb	location	0813520447	[signature]
Simon ZIRICHOB	location	0812224433	[signature]
Michael Jackson Afrikaner	Location	0878704944	MJAfrikaner.
Maria ǂNauses	Location	0815538613	ǂNausec
Theresia EISES	Location	0813368509	[signature]
Christina Rooinasie	Location	08163737691	[signature]
Lorensia	Steuve	0818343196	L. Steuve
Kotjipati Ernest	location	0816406924	[signature]
Jerry Seibeb	Location	0812059548	[signature]
Willem Van Wyk	Location	0812966838	[signature]
Erika Afrikaner	Location	0812519461	[signature]

CUVEPALM CONSULTING
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NAME	Organisation/ Location	PHONE NUMBER	SIGNATURE
Safine Xoagus	Location	0812263629	
Magdalena Muranji	Education/Magdalena	0816879135 Murangi@gmail.com	
Judika Damster	Community member	0818369801	
Martha Tjomize	Community Activist.	0816818165	
Tefta Gariseb	community	0817482015	
PETRUS TJOMBE	Community Member	0816825735	
Ferdinand Gaeb.	Community	0813855353	
Veronika Visagie	Community	0813751528	
Ricardo Visagie	Community	0813636814	RV
Fritz Eiseb	Community	0813935[illegible]	
Hendrina Afrikaner	Community Member	0814680962	H. Afrikaner
Erika Oaes	Community member	0815741295	Oaes
Lukas Ngomxob	Community	0812101177	
Anna Kuibeen	Community	0812101177	
Desiree Nuises	Community monte	0815514963	

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NAME	Organisation/ Location	PHONE NUMBER	SIGNATURE
THeresia Haoses	Cominity Witvlei	081 4825441	THaoses
molatebie nluseb	Cominu Witvlei	0815542963	[illegible]
nlatalia Kasorakutara	Witvlei	0815542963	[illegible]
Talitha Haoses	Witvlei	0817521878	T. H
Immanuel Haoseb	Witvlei	0812405456	Ihaoseb
Cecilia Rieth	Baster location	~~[illegible]~~ 0818270578	[illegible]
Johanna Dunn	Witvlei	0818476777	J.Dun
Abraham Bronzel	Witvlei	0815542963	[illegible]
Katrina Jagger	Witvlei	0817095977	K.Jn.
Elton Tsowaseb	WiTvlei .	0812320222	E.T
Berlin Nguvauva	WiTvlei	0818474512	B. N.
Roseline Skryner	WiTVLei	0815684650	R.Sn.
Fourtus Jagger	W.Tvlei	0817095977	F.Jg.

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STAKEHOLDERS CONSULTATION REGISTER:

PROJECT : PROPOSED COPPER SMELTER PLANT AT WITVLEI, OMAHEKE REGION-NAMIBIA

Venue: Hoadadi Community Hall **Time: 14:00**

Date: 16 March 2021

NAME	Organisation/ Location	PHONE NUMBER	SIGNATURE
Chris Andrews	Chair WVC	0817394181	[signature]
Ben BIWA	ABC	0811282636	[signature]
Katjimuina Tjozongoro	New Horizon Inv. Group	0815559565	[signature]
Vevangapi Katjiuanjo	New Horizon Inv. Gr.	0812614457	[signature]
Ivette Tjituka	" " "	0813155856	[signature]
Gustav Nawuru	" " "	0815578255	[signature]
Emmael Haraseb	" " "	0818372479	Emm
BARONA OAES	~~ABC~~	0818677516	Baes
Andy Areb	" " "	0813809646	Arebeb
ISSASKAR ISSY KAETEE	" " "	0816252962	[signature]

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NAME	Organisation/ Location	PHONE NUMBER	SIGNATURE
Kimenus Konnie Gomes	"	081 4696106	
Kaijandororwandu Ronaldo	"	0818558203	
Geron Van Wyk	"	0815921070	
RAYMAND DOESEB	"	0815476907	
Ellen Afrikaner	"	0814188731	
Vanessa Geingos	"	0812738834	
Memory Eises	"	0814110338	
Lisa-marie Smeer	"	0812187528	
Annastasia Oaes	"	0812792712	
Selma Silvia Eises	"	0816228705	
SAGELIS UIRAB (LESSY)		081-3065014	
Rudolf Tsaneb	"	0817473825	
I.P HENNES	"	081 1243541	
G. Heiser		081 418 6086	
M. Pack		081 6594206	

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NAME	Organisation/ Location	PHONE NUMBER	SIGNATURE
S. WILCKENS	WITVLEY	0812437242	[signature]
R. Paul	Witvlei	081 394 9311	[signature]
T.M. Cocklin	Witvlei	0811276791	[signature]
U. Hof	Witvlei	0811288208	[signature]
J. Hepstein	Witvlei	0813107017	[signature]
K.W. Kasel	Witvlei	081128 11C2	[signature]
A I Blaauw	Witvlei	062-5 70326	[signature]
Susanna Eises	witvlei	0817836803	[signature]
Josef uandara	witvlei	0813216962	[signature]
Regina Seibes	witvlei	0818018465	[signature]
Rosetna Afrikaner	witvlei New Resident	0817575902	[signature]
Jod Tsowaseb	"	0812704578	[signature]
S. WITBEEN	"	0814809122	[signature]
Thusnelde Vrymen	witvlei	0815602064	T Vrymen
Silvester Gomxob	witvlei	0812940608	[signature]

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NAME	Organisation/ Location	PHONE NUMBER	SIGNATURE
FILLEMON PINEHAS	WITVLEI	0818579797	
Elikam Shuudifanya	WITVLEI	0813917858	
Moses Shivute	WITVLEI	0817945353	
maurensia soreseb	witvLEI	0816328981	
Johannes Stagwer	Witvlei	–	
Isaak Ochurub	witvlei	0813421397	
Erick Jagger	Witvlei	0816994806	
Jacky Haoseb	Witvlei	0818686916	
Samuel Kuta	Witvlei	0813506070	
Alberto	Witvlei	0813506070	
Mathias Mohatla		0817511869	
Sungeday Afrikaner	witvlei	081	
CRUZ	Witvlei	081	

Registration Form

ENVIRONMENTAL IMPACT ASSESSMENT

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE PROPOSED CONSTRUCTION AND OPERATION OF A COPPER SMELTER PLANT REGISTRATION AND COMMENTS FORM

I request to be registered as an Interested and Affected Party for the proposed project. Please provide me all relevant information regarding the project throughout the EIA process and invite me to all meetings. My particulars are as follow:

Name: KONDOWONA KARUMENDU Telephone: 0814079111

Organization: Farm Designation: OWN

E-mail: koo.karumendu@gmail.com Postal address: P.O Box 12 Witvlei

My interest in this project:

Youth to get job

Comments and matters of concern:

It will be good for the community
It will bring job to witvlei

Signature: Date: 16 March 2021

Please return this completed form on or before 31 March 2021

Registration Form

ENVIRONMENTAL IMPACT ASSESSMENT

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE PROPOSED CONSTRUCTION AND OPERATION OF A COPPER SMELTER PLANT REGISTRATION AND COMMENTS FORM

I request to be registered as an Interested and Affected Party for the proposed project. Please provide me all relevant information regarding the project throughout the EIA process and invite me to all meetings. My particulars are as follow:

Name: Thomas M. Cocklin Telephone: 0811276791

Organization: Farmer Designation:

E-mail: brangus@mtcmobile.com.na Postal address: P.O. Box 41 Witvlei

My interest in this project: My Farm borders against Witvlei Town

Comments and matters of concern: What stepswil betaken to curb

1. Dust Pollution
2. Liquid waste
3. Solid waste

Signature: Date: 16 March 2021

Please return this completed form on or before 31 March 2021

Registration Form

ENVIRONMENTAL IMPACT ASSESSMENT

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE PROPOSED CONSTRUCTION AND OPERATION OF A COPPER SMELTER PLANT REGISTRATION AND COMMENTS FORM

I request to be registered as an Interested and Affected Party for the proposed project. Please provide me all relevant information regarding the project throughout the EIA process and invite me to all meetings. My particulars are as follow:

Name: Hennes Telephone: 062-570322

Organization: Farmer Designation:

E-mail: hennes@iway.na Postal address: Box 44 Witvlei

My interest in this project:

Comments and matters of concern:

Where are the mines you are talking about??? Where do you get your material to mine???

Signature: Date: 16/3/21

Please return this completed form on or before 31 March 2021

Registration Form

ENVIRONMENTAL IMPACT ASSESSMENT

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE PROPOSED CONSTRUCTION AND OPERATION OF A COPPER SMELTER PLANT REGISTRATION AND COMMENTS FORM

I request to be registered as an Interested and Affected Party for the proposed project. Please provide me all relevant information regarding the project throughout the EIA process and invite me to all meetings. My particulars are as follow:

Name: Regina seibes Telephone: 0818018465

Organization: Witvlei Designation:

E-mail: / Postal address: P.O box 55

My interest in this project:

To open work for witvlei community

Comments and matters of concern:

It will be good to bring job to witvlei for the community

Signature: Date: 16 March 2021

Please return this completed form on or before 31 March 2021

Registration Form

ENVIRONMENTAL IMPACT ASSESSMENT

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I request to be registered as an Interested and Affected Party for the proposed project. Please provide me all relevant information regarding the project throughout the EIA process and invite me to all meetings. My particulars are as follow:

Name: Susanna Eises Telephone: 0817836803

Organization: Witvlei Designation:

E-mail: / Postal address: P.O BOX55

My interest in this project:

To open work for witvlei community

Comments and matters of concern:

It will be good for the community to bring the job to witvlei

Signature: Date: 16 March 2021

Please return this completed form on or before 31 March 2021

Registration Form

ENVIRONMENTAL IMPACT ASSESSMENT

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I request to be registered as an Interested and Affected Party for the proposed project. Please provide me all relevant information regarding the project throughout the EIA process and invite me to all meetings. My particulars are as follow:

Name: Maria Nauses Telephone: 0815508613

Organization: witvlei Designation:

E-mail: — Postal address: P.O box 55

My interest in this project:

To have job in witvlei for community

Comments and matters of concern:

I will be good for ~~us~~ witvlei community

To have job in witvlei

Signature: #Nauses Date: 16 march 2021

Please return this completed form on or before 31 March 2021

Registration Form

ENVIRONMENTAL IMPACT ASSESSMENT

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE PROPOSED CONSTRUCTION AND OPERATION OF A COPPER SMELTER PLANT REGISTRATION AND COMMENTS FORM

I request to be registered as an Interested and Affected Party for the proposed project. Please provide me all relevant information regarding the project throughout the EIA process and invite me to all meetings. My particulars are as follow:

Name: Johannes Reed Telephone: 0813421397

Organization: Job Designation: -

E-mail: - Postal address: 100 Witulie

My interest in this project:

Environmental

Comments and matters of concern:

No Comment

Signature: J. REED Date: 16 March 2021

Please return this completed form on or before 31 March 2021

Registration Form

ENVIRONMENTAL IMPACT ASSESSMENT

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE PROPOSED CONSTRUCTION AND OPERATION OF A COPPER SMELTER PLANT REGISTRATION AND COMMENTS FORM

I request to be registered as an Interested and Affected Party for the proposed project. Please provide me all relevant information regarding the project throughout the EIA process and invite me to all meetings. My particulars are as follow:

Name: Johannes Eiseb Telephone: 0817598002

Organization: Designation:

E-mail: Postal address:

My interest in this project:

machinery

Comments and matters of concern:

Is this a on-going mining project?

Signature: Date:

Please return this completed form on or before 31 March 2021

Registration Form

ENVIRONMENTAL IMPACT ASSESSMENT

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE PROPOSED CONSTRUCTION AND OPERATION OF A COPPER SMELTER PLANT REGISTRATION AND COMMENTS FORM

I request to be registered as an Interested and Affected Party for the proposed project. Please provide me all relevant information regarding the project throughout the EIA process and invite me to all meetings. My particulars are as follow:

Name: Isaak Ochurub

Telephone: 0813421397

Organization: Job

Designation: —

E-mail: —

Postal address: 100 witvlei

My interest in this project:

Environmental

Comments and matters of concern: No comments just great that the witvlei people get job.

Signature: I. Ochurub

Date: 16/03/2021

Please return this completed form on or before 31 March 2021

Registration Form

ENVIRONMENTAL IMPACT ASSESSMENT

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE PROPOSED CONSTRUCTION AND OPERATION OF A COPPER SMELTER PLANT REGISTRATION AND COMMENTS FORM

I request to be registered as an Interested and Affected Party for the proposed project. Please provide me all relevant information regarding the project throughout the EIA process and invite me to all meetings. My particulars are as follow:

Name: Lorensia Stewe

Telephone: 0818343196

Organization:

Designation: Community member

E-mail: —

Postal address: P.O.Box 30 Witvlei

My interest in this project:
To get jobs

Comments and matters of concern:

Signature: L. Stewe

Date: 16 ~~Febr~~March 2021

Please return this completed form on or before 31 March 2021

Registration Form

ENVIRONMENTAL IMPACT ASSESSMENT

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE PROPOSED CONSTRUCTION AND OPERATION OF A COPPER SMELTER PLANT REGISTRATION AND COMMENTS FORM

I request to be registered as an Interested and Affected Party for the proposed project. Please provide me all relevant information regarding the project throughout the EIA process and invite me to all meetings. My particulars are as follow:

Name: Nikodemus Namandi Telephone: 0812216810

Organization: Designation: comminity member

E-mail: — Postal address: P. O. Box 30 witvlei

My interest in this project:
To get jobs in witvlei

Comments and matters of concern:

Signature: Date: 16-03-2021

Please return this completed form on or before 31 March 2021

Registration Form

ENVIRONMENTAL IMPACT ASSESSMENT

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE PROPOSED CONSTRUCTION AND OPERATION OF A COPPER SMELTER PLANT

REGISTRATION AND COMMENTS FORM

I request to be registered as an Interested and Affected Party for the proposed project. Please provide me all relevant information regarding the project throughout the EIA process and invite me to all meetings. My particulars are as follow:

Name: Silvia Nau-Gawuses   Telephone: 0817575907

Organization: General Worker   Designation: Participant

E-mail: Silviaafrikaner@gmail.com   Postal address: P.O. Box 100

My interest in this project:
My interest is to work as a General Worker.

Comments and matters of concern:

Signature: Silvia   Date: 16 March 2021

Please return this completed form on or before 31 March 2021

Registration Form

ENVIRONMENTAL IMPACT ASSESSMENT

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE PROPOSED CONSTRUCTION AND OPERATION OF A COPPER SMELTER PLANT REGISTRATION AND COMMENTS FORM

I request to be registered as an Interested and Affected Party for the proposed project. Please provide me all relevant information regarding the project throughout the EIA process and invite me to all meetings. My particulars are as follow:

Name: Josef Gandara Telephone: 0813216962

Organization: Witvlei Designation:

E-mail: ✓ Postal address: 55 Witvlei

My interest in this project:

To open work for witvlei community

Comments and matters of concern:

It will be very good to open this bussiness to a community for the witvlei.

Signature: Date: 16 March 2021

Please return this completed form on or before 31 March 2021

Registration Form

ENVIRONMENTAL IMPACT ASSESSMENT

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE PROPOSED CONSTRUCTION AND OPERATION OF A COPPER SMELTER PLANT REGISTRATION AND COMMENTS FORM

I request to be registered as an Interested and Affected Party for the proposed project. Please provide me all relevant information regarding the project throughout the EIA process and invite me to all meetings. My particulars are as follow:

Name: ROBERT PACK Telephone: 081 394 9311

Organization: Farmer Designation: Owner

E-mail: akasandu@iway.na Postal address: 21, Witvlei

My interest in this project:

Possible effected Farmers

Comments and matters of concern:

Signature: Date: 16/03/2021

Please return this completed form on or before 31 March 2021

Registration Form

ENVIRONMENTAL IMPACT ASSESSMENT

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE PROPOSED CONSTRUCTION AND OPERATION OF A COPPER SMELTER PLANT REGISTRATION AND COMMENTS FORM

I request to be registered as an Interested and Affected Party for the proposed project. Please provide me all relevant information regarding the project throughout the EIA process and invite me to all meetings. My particulars are as follow:

Name: JUANDELINE Telephone: 0813530945

Organization: Designation: Cpl

E-mail: Postal address: POBOX 55

My interest in this project:

Working as a cleaning

Comments and matters of concern:

IS Good to have job in Witulei for our people

Signature: Date: 16/03/21

Please return this completed form on or before 31 March 2021

Registration Form

ENVIRONMENTAL IMPACT ASSESSMENT

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE PROPOSED CONSTRUCTION AND OPERATION OF A COPPER SMELTER PLANT REGISTRATION AND COMMENTS FORM

I request to be registered as an Interested and Affected Party for the proposed project. Please provide me all relevant information regarding the project throughout the EIA process and invite me to all meetings. My particulars are as follow:

Name: Hans Afrikaner Telephone: 0814990577

Organization: Designation:

E-mail: afrikanerhans@gmail.co Postal address:

My interest in this project:

Employment opportunities

Comments and matters of concern:

To be informed on all matters regarding employment opportunities for unemployed youth of Witvlei ~~unemployment~~

Signature: HAfrikaner Date: 16.03.2021

Please return this completed form on or before **31 March 2021**

Registration Form

ENVIRONMENTAL IMPACT ASSESSMENT

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE PROPOSED CONSTRUCTION AND OPERATION OF A COPPER SMELTER PLANT REGISTRATION AND COMMENTS FORM

I request to be registered as an Interested and Affected Party for the proposed project. Please provide me all relevant information regarding the project throughout the EIA process and invite me to all meetings. My particulars are as follow:

Name: Erasto Viroe **Telephone:** 0818806390

Organization: **Designation:**

E-mail: **Postal address:**

My interest in this project:

I want to see the development

Comments and matters of concern:

Signature: **Date:** 16/03/2021

Please return this completed form on or before **31 March 2021**

Registration Form

ENVIRONMENTAL IMPACT ASSESSMENT

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE PROPOSED CONSTRUCTION AND OPERATION OF A COPPER SMELTER PLANT REGISTRATION AND COMMENTS FORM

I request to be registered as an Interested and Affected Party for the proposed project. Please provide me all relevant information regarding the project throughout the EIA process and invite me to all meetings. My particulars are as follow:

Name: Lourens Andrews Telephone: 0812209441

Organization: Designation: Witvlei unemployed

E-mail: brickzandrews@gmail.com lourensandrews@gmail.com Postal address: P.O. Box 55 Witvlei.

My interest in this project: is that it will generate job opportunities for most of us. is to learn new skills and share my skills with others.

Comments and matters of concern:

I totally support the idea and the proposal of this project as it will be a great help to the community of witvlei as it will eradicate unemployment.

Signature: L. Andrews Date: 16 March 2021

Please return this completed form on or before 31 March 2021

Registration Form

ENVIRONMENTAL IMPACT ASSESSMENT

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE PROPOSED CONSTRUCTION AND OPERATION OF A COPPER SMELTER PLANT REGISTRATION AND COMMENTS FORM

I request to be registered as an Interested and Affected Party for the proposed project. Please provide me all relevant information regarding the project throughout the EIA process and invite me to all meetings. My particulars are as follow:

Name: U, Hart Telephone: 0812288208

Organization: Okatjeru'o Farmy cc Designation: owner.

E-mail: ulrikehart@iway.na Postal address: P.O Box 11539 Windhoek.

My interest in this project:
Environmental

Comments and matters of concern:
Ground water pollution
Air pollution.
General Health of Public + workers.
Is the community going to benefit?.

Signature: [signature] Date: 16.03.2021.

Please return this completed form on or before **31 March 2021**

Registration Form

ENVIRONMENTAL IMPACT ASSESSMENT

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE PROPOSED CONSTRUCTION AND OPERATION OF A COPPER SMELTER PLANT

REGISTRATION AND COMMENTS FORM

I request to be registered as an Interested and Affected Party for the proposed project. Please provide me all relevant information regarding the project throughout the EIA process and invite me to all meetings. My particulars are as follow:

Name: THOMAS GARISEB **Telephone:** 081 6575768

Organization: Welder **Designation:** ~~patipaten~~ paticipater

E-mail: bwaltog@gmail.com.NA **Postal address:** P.O.Box 100 Witvlei

My interest in this project:

I am interest in this project it will learn my more about Smelting Copper

Comments and matters of concern:

~~It~~ This will help the people with ~~they~~ They life and change their problem.

Signature: [signature] **Date:** 16 March 2021

Please return this completed form on or before **31 March 2021**

Registration Form

ENVIRONMENTAL IMPACT ASSESSMENT

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE PROPOSED CONSTRUCTION AND OPERATION OF A COPPER SMELTER PLANT REGISTRATION AND COMMENTS FORM

I request to be registered as an Interested and Affected Party for the proposed project. Please provide me all relevant information regarding the project throughout the EIA process and invite me to all meetings. My particulars are as follow:

Name: SAGGEUS CIRAS (EDDY) Telephone: 081-3065214

Organization: SELF Designation: WITVLEI

E-mail: eddymurphy619@gmail.com Postal address: Box 55

My interest in this project: TO REDUCE UNEMPLOYMENT IN OUR WITVLEI VILLAGE. ME MYSELF TO BE EMPLOYED

Comments and matters of concern:

IT'S REALLY A GOOD THING IN TERMS OF UNEMPLOYMENT RATE ACCURRING IN THIS PLACE. I FULLHEARTEDLY SUPPORT THE SMELTING BUSINESS.

Signature: Date: 17/03/2021

Please return this completed form on or before 31 March 2021

Registration Form

ENVIRONMENTAL IMPACT ASSESSMENT

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE PROPOSED CONSTRUCTION AND OPERATION OF A COPPER SMELTER PLANT REGISTRATION AND COMMENTS FORM

I request to be registered as an Interested and Affected Party for the proposed project. Please provide me all relevant information regarding the project throughout the EIA process and invite me to all meetings. My particulars are as follow:

Name: Harold Stanley Goagoseb Telephone: 0813889642

Organization: — Designation: Unemployed

E-mail: — Postal address: P.o.Box 5

My interest in this project: To be a Driver or any other availeble job.

Comments and matters of concern: I think it's a good idea to start a Copper Smelter Plant to create more job opportunity's.

Signature: Date: 17/03/2021

Please return this completed form on or before **31 March 2021**

Registration Form

ENVIRONMENTAL IMPACT ASSESSMENT

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE PROPOSED CONSTRUCTION AND OPERATION OF A COPPER SMELTER PLANT REGISTRATION AND COMMENTS FORM

I request to be registered as an Interested and Affected Party for the proposed project. Please provide me all relevant information regarding the project throughout the EIA process and invite me to all meetings. My particulars are as follow:

Name: C. THEISSEN Telephone: 081 122 6615

Organization: FARMER Designation:

E-mail: theissencat@gmail.com Postal address:

My interest in this project:
Good for the community.

Comments and matters of concern:
No Money/shares etc to Individuals/council
Rather TRUST FUND to fund Schools/Hospitals et

Signature: C. Theissen Date: 18/3/2021

Please return this completed form on or before 31 March 2021

Registration Form

ENVIRONMENTAL IMPACT ASSESSMENT

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE PROPOSED CONSTRUCTION AND OPERATION OF A COPPER SMELTER PLANT REGISTRATION AND COMMENTS FORM

I request to be registered as an Interested and Affected Party for the proposed project. Please provide me all relevant information regarding the project throughout the EIA process and invite me to all meetings. My particulars are as follow:

Name: DONOVAN LUBBE Telephone: +26481621317 0

Organization: Witvlei Youth Forum Designation: Activist

E-mail: donovandiebok@gmail.com Postal address: 1881 GOBABIS

My interest in this project:

Employment opportunities

Comments and matters of concern:

To be informed on all matters regarding employment opportunities for unemployed youth of Witvlei

Signature: Date: 17-03-2021

Please return this completed form on or before 31 March 2021

Registration Form

ENVIRONMENTAL IMPACT ASSESSMENT

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE PROPOSED CONSTRUCTION AND OPERATION OF A COPPER SMELTER PLANT REGISTRATION AND COMMENTS FORM

I request to be registered as an Interested and Affected Party for the proposed project. Please provide me all relevant information regarding the project throughout the EIA process and invite me to all meetings. My particulars are as follow:

Name: H. Pack Telephone: 062-570327

Organization: Farmer Designation:

E-mail: ottawa@iway.na Postal address: 16 Witvlei

My interest in this project:

Comments and matters of concern:

Signature: Date: 17/3/2021

Please return this completed form on or before 31 March 2021

Registration Form

ENVIRONMENTAL IMPACT ASSESSMENT

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE PROPOSED CONSTRUCTION AND OPERATION OF A COPPER SMELTER PLANT REGISTRATION AND COMMENTS FORM

I request to be registered as an Interested and Affected Party for the proposed project. Please provide me all relevant information regarding the project throughout the EIA process and invite me to all meetings. My particulars are as follow:

Name: Karl-Wilfried Kasch Telephone: 062-560291 0811281112

Organization: Farmer Designation: Interested Party

E-mail: karl.kasch@gmail.com Postal address: Box 1883 Lhk

My interest in this project:

Not directly affected, but poaching will increase as a whole

Comments and matters of concern:

Please see attached letter.

Signature: Date: 31/03/2021

Please return this completed form on or before 31 March 2021

WITVLEI COPPER SMELTER AND COPPER MINE NEAR WITVLEI

"New Horizon Investment"

31st March 2021

I am a farmer in the greater Witvlei area. I support any attempt of providing work to the many poor people living in Witvlei, most of whom do not have a regular income and are forced to live below the bread line. The proposed copper smelter at Witvlei could potentially uplift the standard of living of some people However, I am genuinely concerned about the feasibility and sustainability of this smelter, which will only have a short-term positive impact. However, on the long-term it is bound to have a negative impact on the living conditions of these people. I shall describe the reasons for these concerns below.

A. Feasibility of the proposed Witvlei Copper Smelter

I have serious doubts about the feasibility of the smelter for the simple reason that I am not aware of a suitable mining operation in the nearby vicinity. Transporting copper ore from existing mines elsewhere does not make sense with respect to the small size of the smelter. If a long-term supply of copper ore cannot be secured, the whole operation does not seem to be sustainable either.

1. Where does the copper come from?
   a. Exploration for copper near Witvlei has to the best of our knowledge not yet come up with a potential copper mine that would warrant a copper smelter at Witvlei.
   b. Which other copper mines in Namibia can supply copper to the proposed Witvlei Copper Smelter?
   c. Will copper be brought from other mines outside Namibia such as Zambia or DRC, or even from oversees?
2. Status of the proposed copper mine near Witvlei
   a. We are not aware of any potential mine that has entered the commissioning phase yet.
   b. Past exploration has come up with copper occurrences in the area.
   c. However, to the best of my knowledge none of these copper occurrences has reached the stage of pre-feasibility drilling, let alone feasibility drilling, which should be completed prior to commissioning a mine.

d. Will the Witvlei Copper Smelter be feasible if there is a much bigger smelter at Tsumeb, even if the Tsumeb smelter must be upgraded to modern standards?

B. Potential toxic waste at the proposed Witvlei Copper Smelter

1. Arsenic is very toxic, and it is commonly present at many copper mines around the world.
2. Arsenic has been a problem as waste at the Tsumeb Smelter, resulting in people getting cancer and dying prematurely.
3. What guarantee is there that the copper to be delivered to the Witvlei Smelter does not contain any arsenic or other toxic substances, which will be set free to the environment at and near Witvlei?
4. Will there be an environmental management plan to handle such a situation and what guarantee do we have that this will be done?

C. Influx control of potential employees to the Witvlei Copper Smelter

1. What will be done to prevent the uncontrolled influx of people from other areas to the Witvlei area looking for employment at the Wittvlei Smelter?
2. I have heard of people from Omitara and Windhoek who intend to move to Witvlei.
3. What will happen to these people if the whole process fails?

D. How is the property of the proposed smelter acquired?

1. Apparently, the company New Horizon Investment has donated 5% shares to the Witvlei Village Council. Can you elaborate on the terms and conditions?
2. Will these funds be used for the benefit of the poor people of Witvlei or are they for the sole benefit of the members of the village council?

Karl-Wilfried Kasch
Concerned Farmer
31st March 2021

REGISTRATION AND COMMENTS FORM

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED MINERAL EXPLORATION ACTIVITIES ON EPLS 7072 AND 7122 IN WITVLEI, OMAHEKE REGION-NAMIBIA

KINDLY COMPLETE THIS FORM IN DETAIL AND RETURN TO:

Cuvepal Environmental Consultants
Telephone: +264 813634904
Email: ekasinganetie@gmail.com

PERSONAL DETAILS

Name & Surname: Karl-Wilfried Kasch
Postal Address: Box 1883, Windhoek Email: Karl.Kasch@gmail.com
Town:

What is your main area of interest regarding the proposed developments?

- Indirect interest as a concerned farmer in the Witvlei area
- Many people will move to Witvlei in the hope to find employment
- This will increase the number of people eventually poaching and stealing cattle
- See also letter attached

Do you have any points of concern or support regarding the proposed projects? If "yes", please briefly list these in point format: YES / NO

NB: See latter attached

Do you wish this project to proceed? YES / NO

STAMP/SIGNATURE

WITVLEI COPPER SMELTER AND COPPER MINE NEAR WITVLEI

"New Horizon Investment"

31st March 2021

Although I am a farmer in the greater Witvlei area, I am not directly affected by the prospecting and/or mining of copper at EPL 7072 to the north of Witvlei. Prospecting and possibly subsequent mining will certainly provide work to at least some of the many poor people living in Witvlei. However, it will certainly attract people from other areas, which will negative impact on the greater Witvlei area. I shall describe the reasons for these concerns below.

A. EPL 7072 copper occurrence

Whilst previous exploration in that area by another company has proven the presence of copper, but to the best of my knowledge no pre-feasibility nor feasibility study has been undertaken. Therefore, I find it strange that a smelter will be built at Witvlei. A resource of 3.8Mt at 1.35% copper is not much and I do not think that this has been proven yet.

B. Negative impact: Potential poaching

Exploration and mining at EPL 7072 will certainly create jobs, but not nearly as many as B2 Gold has created. Unfortunately, this will also result in many people from other areas to migrate to Witvlei, because these people think that a mine will create many jobs. These people think it will be a big mine, but at present the best I can think of is that it will be a very small mine. Therefore I am sure that many more people will migrate to Witvlei than both the proposed mine and the smelter can provide jobs for. As a result, these people will also hang around Witvlei and start poaching. Poaching and cattle theft is already a big problem in the greater Witvlei-Omitara area.

Karl-Wilfried Kasch
Concerned Farmer
31st March 2021

From: Karl Kasch <karl.kasch@gmail.com>
Sent: Thursday, 1 April 2021 12:34 pm
To: Ekasinganetie <ekasinganetie@gmail.com>
Subject: Witvlei Copper Smelter and EPL 7072

Good afternoon,

Attached please find two registration forms as Interested and Affected Party with letters of concern. Unfortunately, my internet did not work yesterday when I wanted to send it, so I am sending this now.

Kind regards,
Karl-Wilfried Kasch

--
Karl Kasch Consulting Geologist
PO Box 1883
Windhoek
Email: karl.kasch@gmail.com
Cell: +264811281112

ENVIRONMENTAL IMPACT ASSESSMENT

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR THE PROPOSED CONSTRUCTION AND OPERATION OF A COPPER SMELTER PLANT REGISTRATION AND COMMENTS FORM

I request to be registered as an Interested and Affected Party for the proposed project. Please provide me all relevant information regarding the project throughout the EIA process and invite me to all meetings. My particulars are as follow:

Name: Karl-Wilfried Kasch Telephone: 062-560291 0811281112

Organization: Farmer Designation: Interested Party

E-mail: karl.kasch@gmail.com Postal address: Box 1883 Lhk

My interest in this project:

Not directly affected, but poaching will increase as a whole

Comments and matters of concern:

Please see attached letter.

Signature: Date: 31/03/2021

Please return this completed form on or before 31 March 2021

WITVLEI COPPER SMELTER AND COPPER MINE NEAR WITVLEI

"New Horizon Investment"

31st March 2021

I am a farmer in the greater Witvlei area. I support any attempt of providing work to the many poor people living in Witvlei, most of whom do not have a regular income and are forced to live below the bread line. The proposed copper smelter at Witvlei could potentially uplift the standard of living of some people However, I am genuinely concerned about the feasibility and sustainability of this smelter, which will only have a short-term positive impact. However, on the long-term it is bound to have a negative impact on the living conditions of these people. I shall describe the reasons for these concerns below.

A. Feasibility of the proposed Witvlei Copper Smelter

I have serious doubts about the feasibility of the smelter for the simple reason that I am not aware of a suitable mining operation in the nearby vicinity. Transporting copper ore from existing mines elsewhere does not make sense with respect to the small size of the smelter. If a long-term supply of copper ore cannot be secured, the whole operation does not seem to be sustainable either.

1. Where does the copper come from?
   a. Exploration for copper near Witvlei has to the best of our knowledge not yet come up with a potential copper mine that would warrant a copper smelter at Witvlei.
   b. Which other copper mines in Namibia can supply copper to the proposed Witvlei Copper Smelter?
   c. Will copper be brought from other mines outside Namibia such as Zambia or DRC, or even from oversees?
2. Status of the proposed copper mine near Witvlei
   a. We are not aware of any potential mine that has entered the commissioning phase yet.
   b. Past exploration has come up with copper occurrences in the area.
   c. However, to the best of my knowledge none of these copper occurrences has reached the stage of pre-feasibility drilling, let alone feasibility drilling, which should be completed prior to commissioning a mine.

d. Will the Witvlei Copper Smelter be feasible if there is a much bigger smelter at Tsumeb, even if the Tsumeb smelter must be upgraded to modern standards?

B. Potential toxic waste at the proposed Witvlei Copper Smelter

1. Arsenic is very toxic, and it is commonly present at many copper mines around the world.
2. Arsenic has been a problem as waste at the Tsumeb Smelter, resulting in people getting cancer and dying prematurely.
3. What guarantee is there that the copper to be delivered to the Witvlei Smelter does not contain any arsenic or other toxic substances, which will be set free to the environment at and near Witvlei?
4. Will there be an environmental management plan to handle such a situation and what guarantee do we have that this will be done?

C. Influx control of potential employees to the Witvlei Copper Smelter

1. What will be done to prevent the uncontrolled influx of people from other areas to the Witvlei area looking for employment at the Wittvlei Smelter?
2. I have heard of people from Omitara and Windhoek who intend to move to Witvlei.
3. What will happen to these people if the whole process fails?

D. How is the property of the proposed smelter acquired?

1. Apparently, the company New Horizon Investment has donated 5% shares to the Witvlei Village Council. Can you elaborate on the terms and conditions?
2. Will these funds be used for the benefit of the poor people of Witvlei or are they for the sole benefit of the members of the village council?

Karl-Wilfried Kasch
Concerned Farmer
31st March 2021

NHIG Response to Interested Party

Inbox ×

Deon@globalsmelters.com <deon@globalsmelters.com> Apr 16, 2021, 9:53 AM

to me, ekasinganetie, benbiwa, berend

Good Morning Martin and Tendai

Please find attached NHIG's response to Mr Kasch, please forward our response to him.

regards

--

Deon Erasmus

E: deon@globalsmelters.com Physical Business Address: Physical Ad

www.globalsmelters.com

15 April 2021

Good day Mr Kasch.

Herewith New Horizon Investment Group's (NHIG) response to your concerns and questions about our Witvlei Smelter Plant and future mine on EPL 7072.

Response to Paragraph A1:

The ore for the smelter will come from our EPL's, we have drilling reports and geological reports which shows sufficient ore for our project. All of these drilling reports are private and confidential, the reports is the IP of NHIG. There is old mines throughout Namibia which also supply ore to our Smelter at Witlvei. However an important note to remember is that the Smelting operations will remain in Witvlei.

No ore will be sourced to feed are smelter from outside of Namibia's border, NHIG is here to support and help grow the local economy of Namibia.

Response to Paragraph A2:

All of the exploration work shows more than adequate ore resources for our Witvlei Smelter, due to our low-cost process. Our smelter also does not need the magnitude ore resource other companies need for their smelters, due to the efficiency of the smelter. The Smelter only uses oxides, where as other operations focus on the sulphides. The Witvlei Smelter can also not be compared to the Tsumeb Smelter, for the smelters are direct opposite of each other and also differ in size. Which is why Witvlei and our ore body is more than efficient for our project.

Response to Paragraph B:

Due to the geology around the Witvlei area, chemical analysis show low-levels of arsenic in comparison with the Tsumeb area. The difference with the Tsumeb Smelter (Dundee Operations), is that the Tsumeb Smelter emits higher levels of arsenic than NHIG's Smelter. NHIG's hydro cyclone after the cooling of the emission gasses shows lower levels of arsenic emissions being released into the atmosphere. An Environmental Management Plan is included in the Environmental Impact Assessment, which is currently under scrutiny by environmental specialists, and after which it will be under scrutiny by the Environmental Department.

Response to Paragraph C:

The Witvlei Village Council along with the company controlling our HR department, is to only employ local members of the Witvlei Community. This is a long term project, that guarantees our project will be successful in the long run, it was reached through intensive studies of the Witvlei Copper deposits and other intellectual properties, however NHIG has the determination and infrastructure to ensure the success of the project for the life of mine project 25 years. NHIG has also a Strategy in place to ensure that the community will still benefit even if the project fails. This strategy has already been submitted to the Governor and his committee (Exit Plan).

Response to Paragraph D:

It has come to our attention that certain accusations have been made that bribes has been made in order for NHIG to acquire the property on which the smelter will be situated on, the property has been granted to NHIG due to the fact that the Witvlei community needs a project to create jobs. The Witvlei Village Council has a 5% share in NHIG. These shares are for the benefit and upliftment of the Witvlei Community. These funds are solely for the benefit of the people of Witvlei, in order to create better living conditions, and to create social upliftment. Part of the social upliftment plan, a clinic will be built in order to improve the health of the community. A board will be created and people will be appointed to be on the board, to ensure that the funds received from the 5% will not be mismanaged.

Response to Paragraph 2A:

The feasibility and financial viability of the project is the concern of NHIG, however the company will not invest so much money into the project only for a project of this magnitude to fail.

Response to Paragraph 2B:

It is not NHIG's intention to be a B2 Gold or Tsumeb project, NHIG is more than confident that this project will create a better life for the people of Witvlei and the Gobabis District.

Conclusion:

It is with great sadness to see that you are not in favour of this project, for NHIG's main priority is the well-being and development of Witvlei. We hope you find this response to your satisfaction and that we have eased all your concerns.

Deon Erasmus
Intern at NHIG
15 April 2021

From: **Buks Kruger** <B.kruger@dundeeprecious.com>
Date: Fri, 26 Mar 2021 at 16:28
Subject: RE: Witvlei Copper Smelter
To: ekasinganetie@gmail.com <ekasinganetie@gmail.com>
Cc: Benedicta Uris <b.uris@dundeeprecious.com>

Dear Mr Kasinganetie

Further to the detail shared during the community presentation at Witvlei on Tuesday 16 March 2021 the following questions:

1. The scoping document refers to dust that will be captured from the smelter off gas system and that this dust will be disposed of as per the relevant legislation – question: what is the expected chemical analysis of this dust and where will it be disposed of – will this dust be hazardous or carcinogenic?
2. According to the scoping document the resulting slag from the smelting operation will be disposed of onsite – what will the chemical analysis of the slag be and will the slag dump be on a geomembrane lined facility? What is the expected leachability of the slag i.e. what will leach from the slag that can impact the ground water quality
3. In the scoping document the furnace off gas dust capture system described mention that cyclones will be used to reduce the dust content of the gas vented to atmosphere to less than

30 micro grams per normal cubic meter – please confirm whether only cyclones will be used or whether there will be any dust filter units installed as well. If only cyclones, please confirm that the cyclones will be able to achieve the less than 30 micro grams per normal cubic meter design criteria.

4. What are all the solid and liquid wastes that will be produced from the smelter and how will they be disposed of – e.g. refractory waste, contaminated storm water,
5. Will any fluxes be added to the furnace (e.g. silica and lime) and where will they be sourced from.
6. Which Air Pollution Standard and which Waste Pollution Standard will be used for the design of the plant

Please also forward an electronic copy of the scoping document.

Regards

Buks Kruger

From: Buks Kruger
Sent: 11 March 2021 15:41
To: ekasinganetie@gmail.com
Subject: Witvlei Copper Smelter

Dear Mr Kasinganetie

Herewith notice that I will be in attendance at the community presentation at Witvlei on Tuesday 16 March 2021 at 14:00 and will be presenting Dundee Precious Metals Tsumeb.

Regards

Buks Kruger

Sent from my iPhone

Buks Kruger | Director: Business Development
Office: +264672234418 | Mobile: +264813186189
B.kruger@dundeeprecious.com

Dundee Precious Metals Tsumeb
P.O. Box 936
Smelter Road, Tsumeb, Namibia
www.dundeeprecious.com

Connect with us:

--

From: **Kirsten Beeker** <kirsten.beeker@wfs.com.na>
Date: Tue, 9 Mar 2021 at 15:13
Subject: EIA: Witvlei Copper Smelter
To: ekasinganetie@gmail.com <ekasinganetie@gmail.com>

Dear Mr. Kasinganeti,

I received your details from a recent EIA advert for the Witvlei Copper Smelter.

We are an "interested party" and will appreciate it if you can share more information with regards to the new development. I will not be able to attend the meeting at this stage.

Thank you in advance.

Kind Regards,

woker freight services (pty) ltd | kirsten beeker | manager: marine, mining & energy
tel +264 64 2012078 | fax +264 64 215 235 | mobile +264 81 244 6036 | skype: kirsten.beeker
2 third street | po box 4 | walvis bay, namibia
kirsten.beeker@wfs.com.na | http://www.wfs.com.na

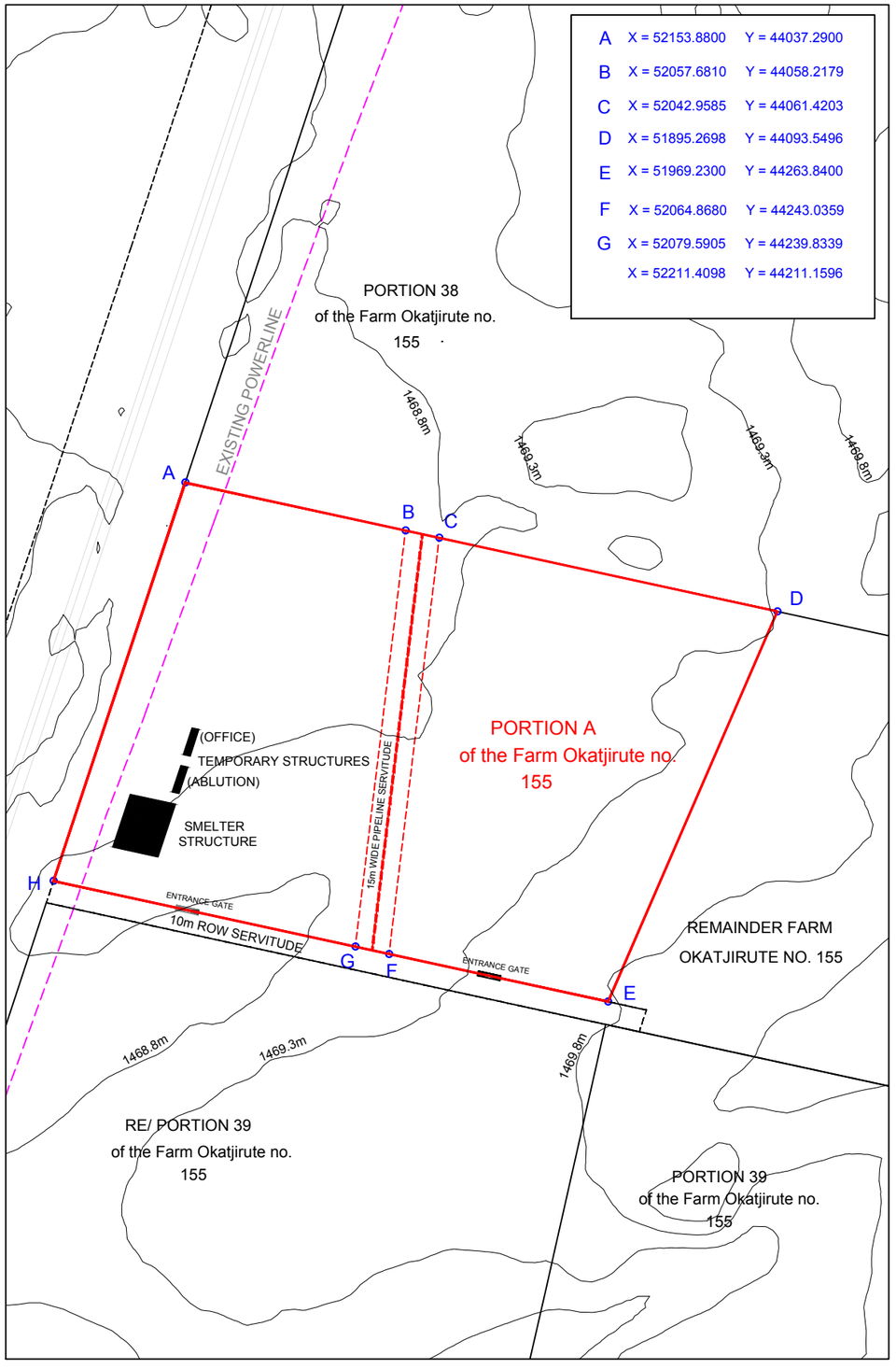
Appendix B:
Maps and Layouts

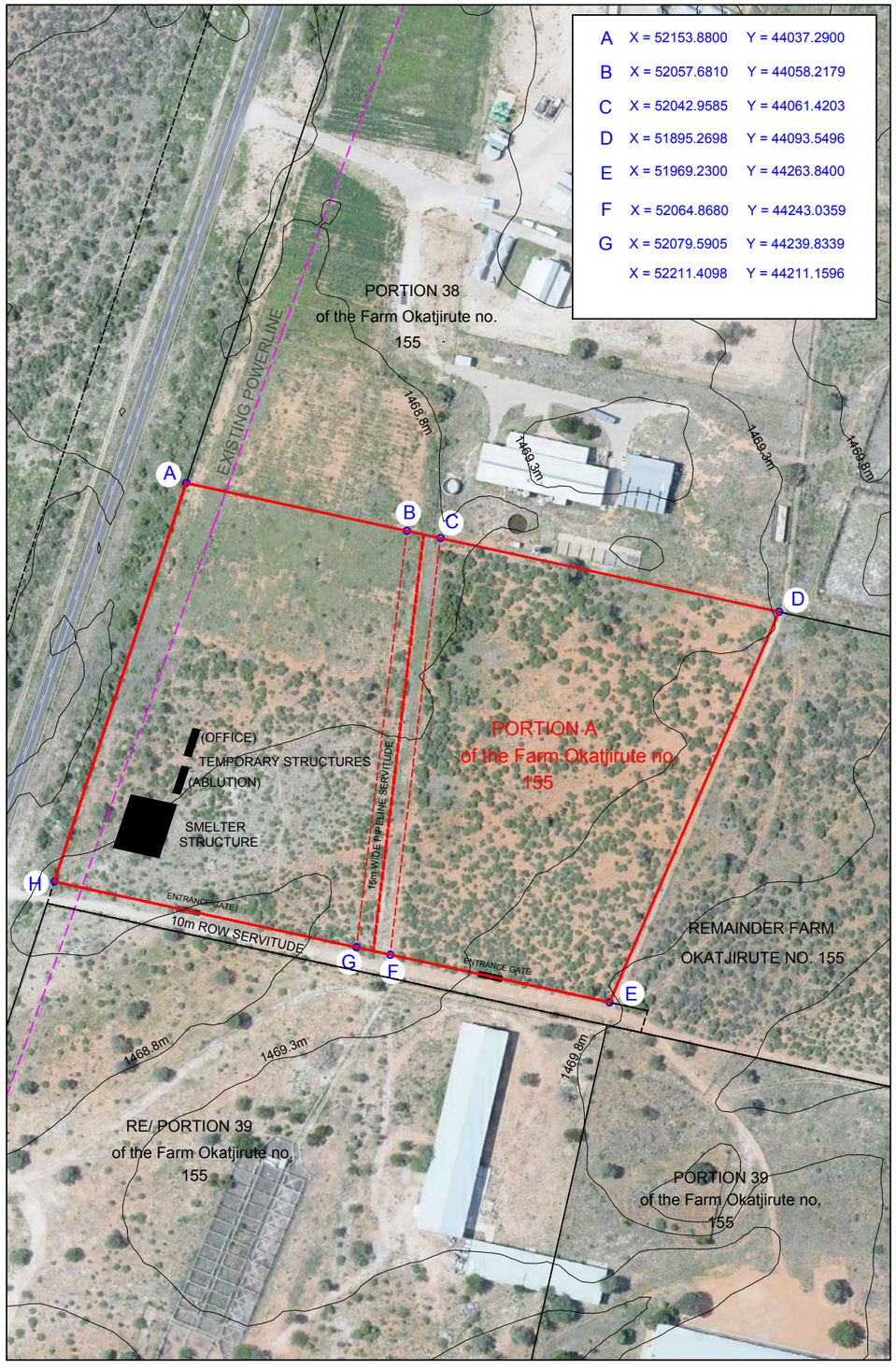
1. Locality Map
2. Plant Preliminary Designs

WITVLEI

PROPOSED PORTION A
OF FARM OKATJIRUTE No. 155
FOR SMELTER PLANT
NEW HORIZON INVESTMENT GROUP
NAMIBIA

A	X = 52153.8800	Y = 44037.2900
B	X = 52057.6810	Y = 44058.2179
C	X = 52042.9585	Y = 44061.4203
D	X = 51895.2698	Y = 44093.5496
E	X = 51969.2300	Y = 44263.8400
F	X = 52064.8680	Y = 44243.0359
G	X = 52079.5905	Y = 44239.8339
	X = 52211.4098	Y = 44211.1596





LEGEND:

BOUNDARY OF PORTION A
FARM OKATJIRUTE No. 155

PORTION A = ± 4,6669 ha

CONTOUR INTERVALS = 50cm

TN

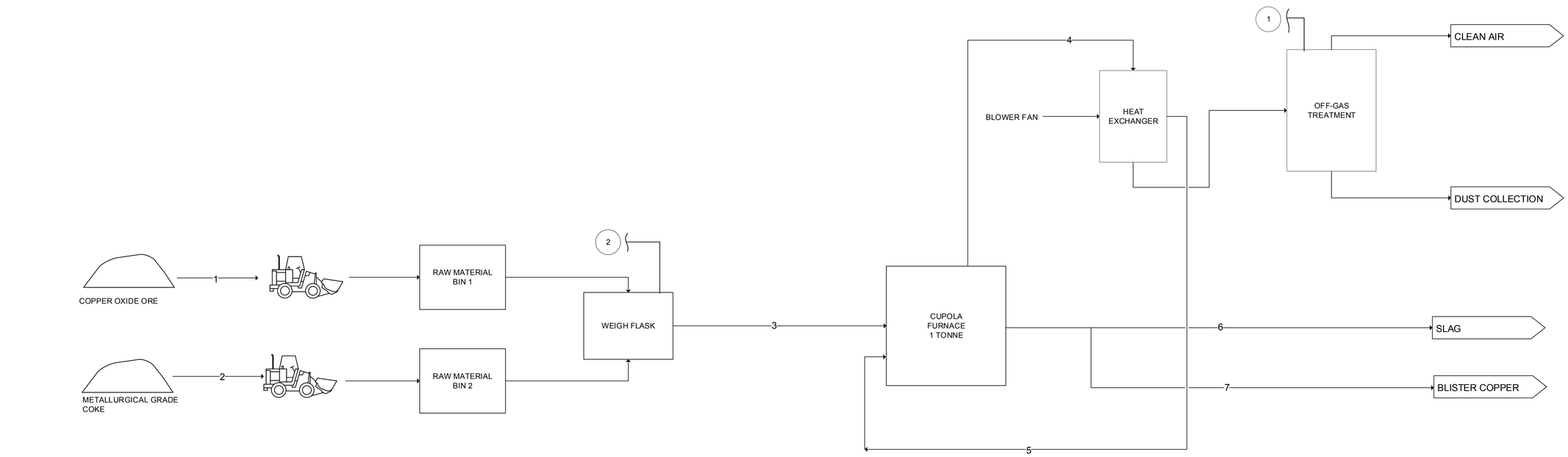
Notes:

PREPARED BY:

WINPLAN
T (061) 246 703
F (061) 246 953
winplan@winplan.com.na
P O Box 90761
Klein Windhoek
Wasserberg Park
1 Jan Jonker Road
Klein Windhoek

SURVEY:			
DESIGN:	WINPLAN		
DRAWN:	WINPLAN	DATE	FEB 2021
UPDATED:			

SCALE	DRAWING NUMBER
1 : 2500 ON A3 PAPER	PTN A_OKATJIRUTE



POTABLE WATER (1)

ELECTRICAL SUPPLY (2)

DRG NUMBER	DRG TITLE	REV	DATE	REVISION DESCRIPTION	DRAWN	CHECKED	ENG.	LEAD ENG.	D.O. MNG.
REFERENCE				REVISION REGISTER					

		SIGN	DATE
DRAWN	S. BEACHAM		24/02/2021
CHECKED			
PROJ ENG.			
LEAD ENG.			
PROC MNG.			
PROJ MNG.			
D.O. MNG.			

CLIENT: CONSULTING MAINTENANCE SERVICES (CMS)

PROJECT: X047 WITVLEI COPPER SMELTER

TITLE: BLOCK FLOW DIAGRAM

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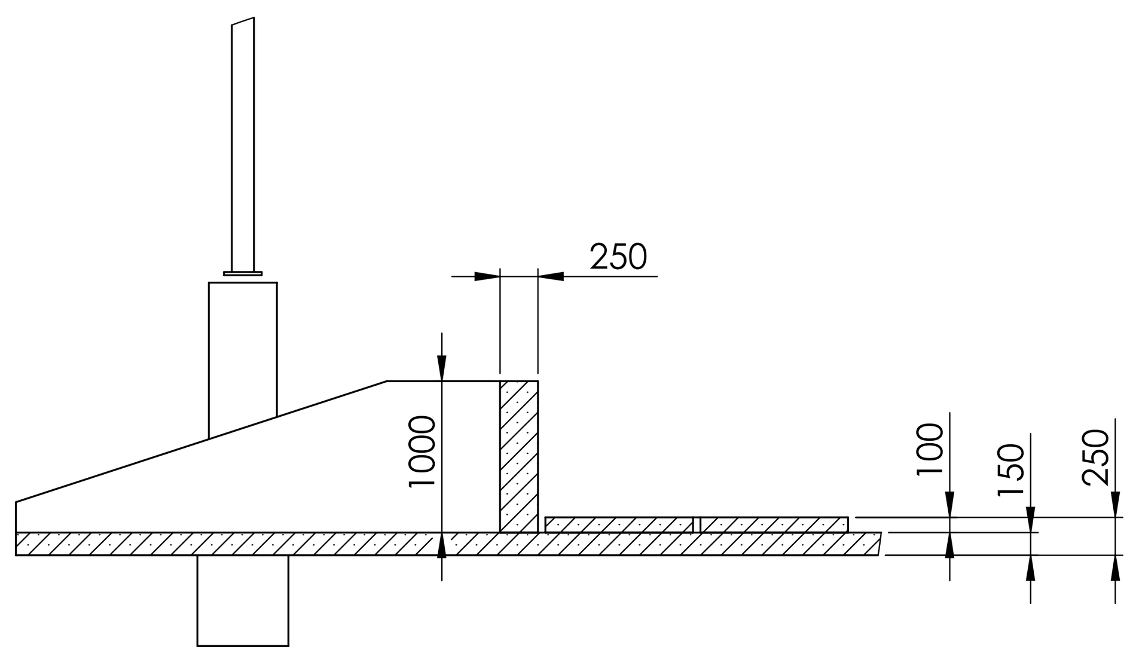

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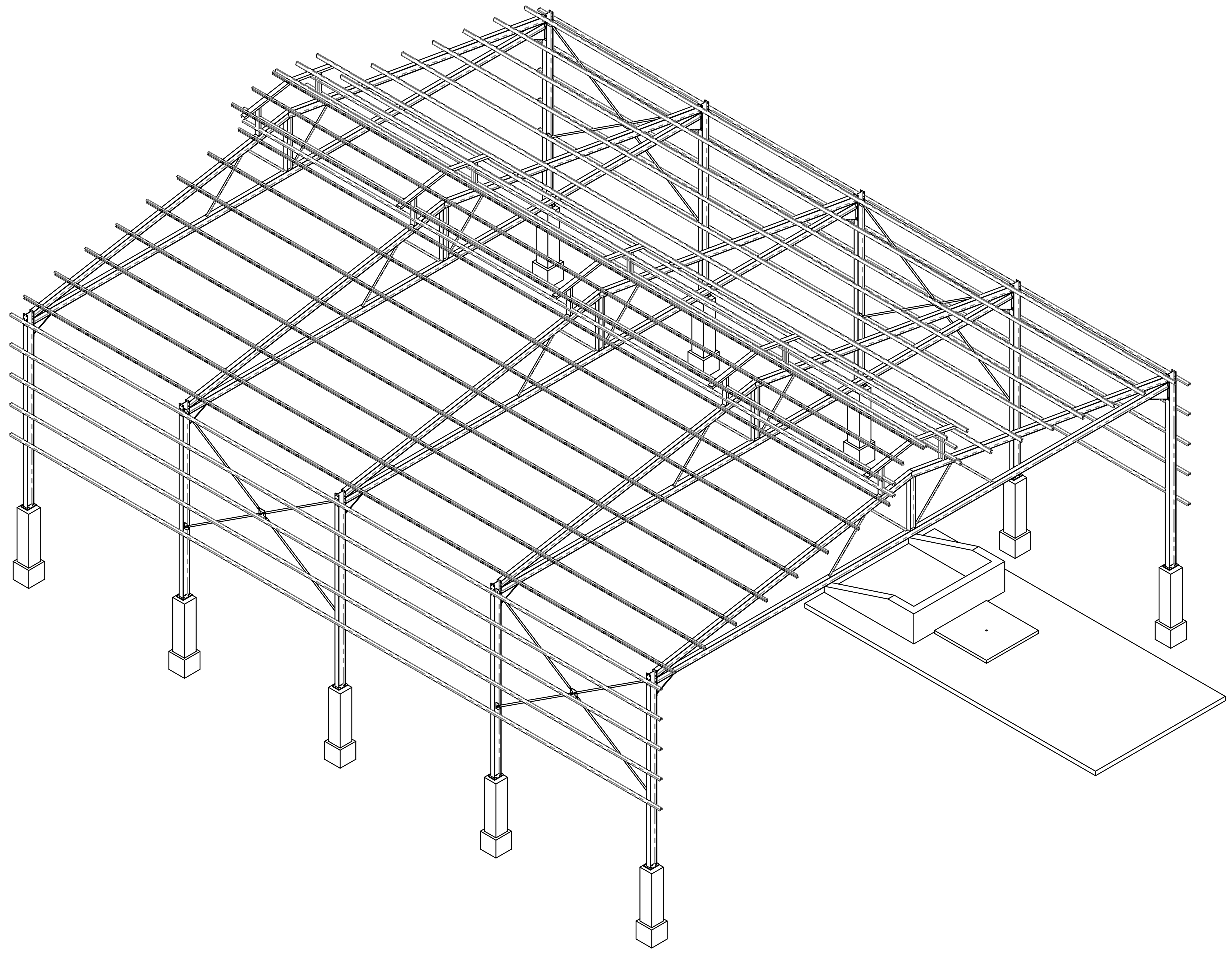

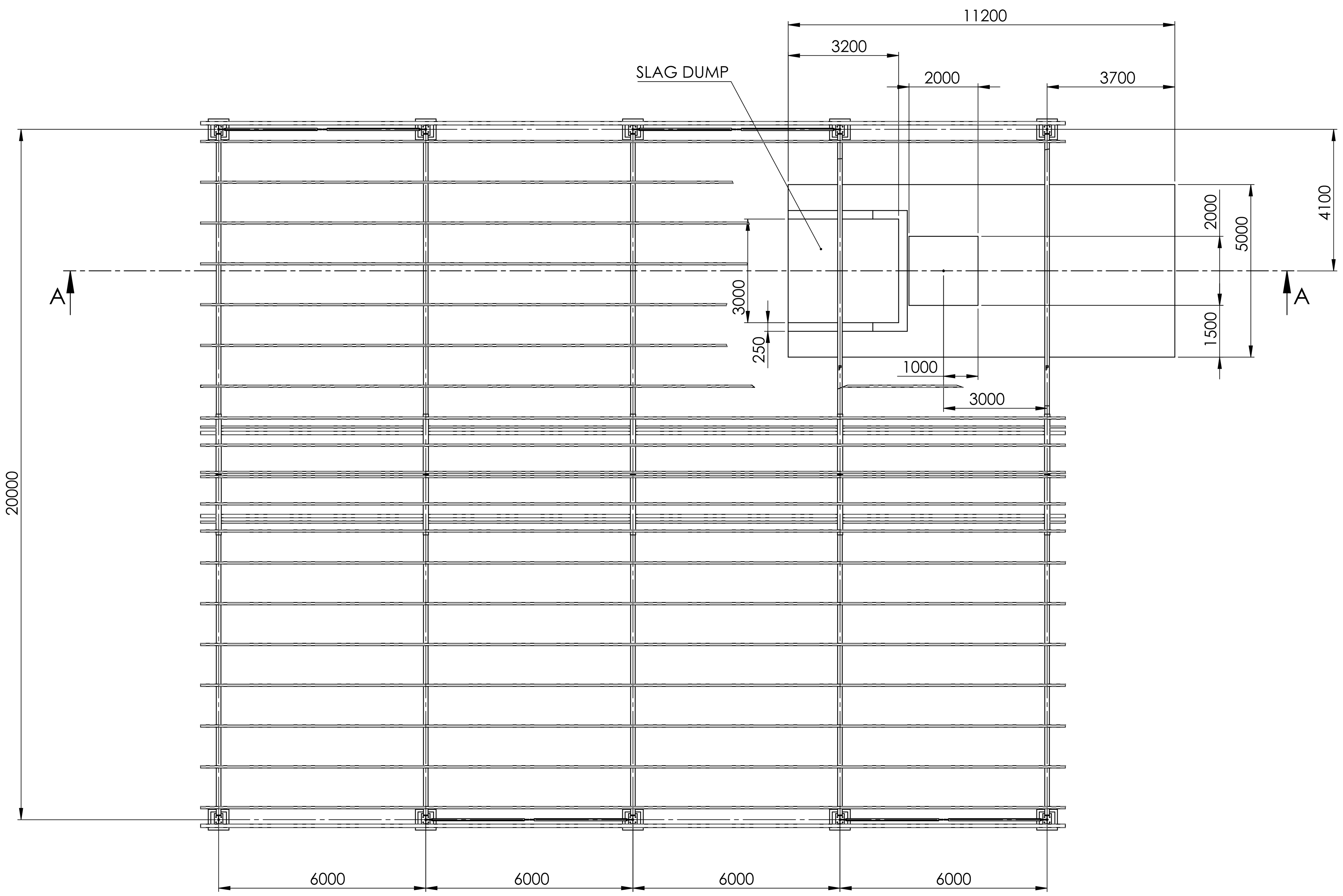

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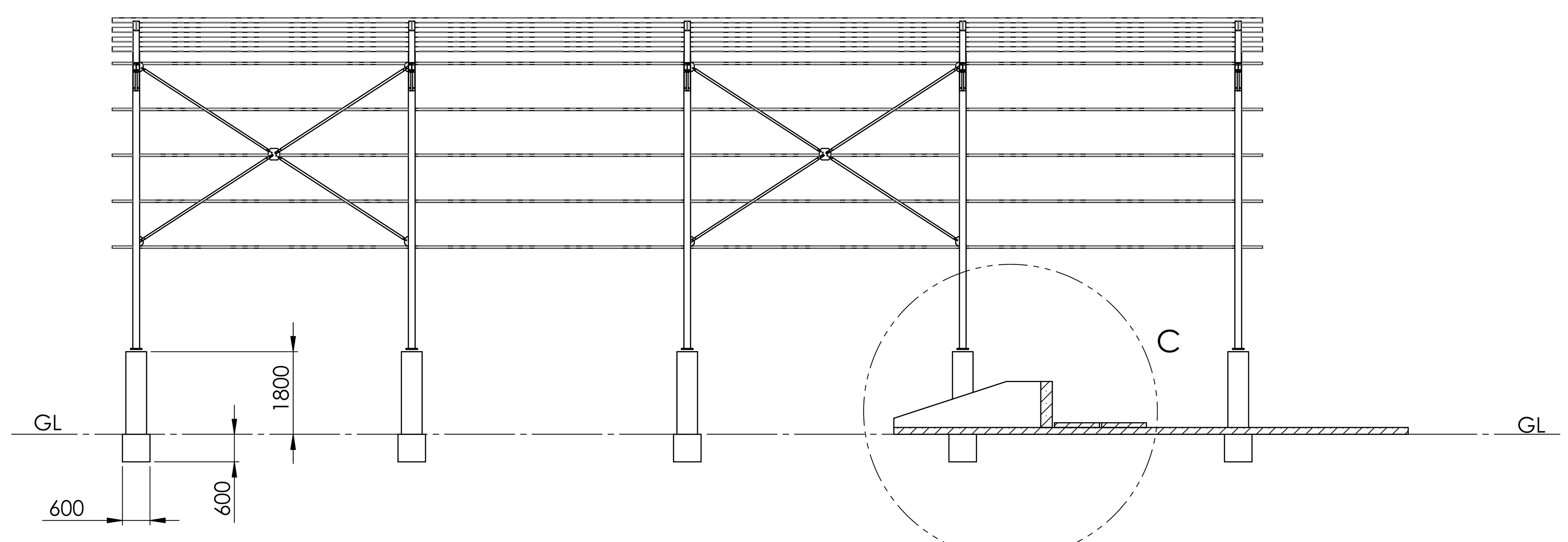

SECTION A-A

DRG. NUMBER	DRG. TITLE
REFERENCE DRAWING NO	

REV	DATE	REVISION DESCRIPTION	DRN	CHK	LDE	ENG	DOM
A	2020/11/10	ISSUED FOR INTERNAL REVIEW	EvH	RvZ	R d C	JJ	RvZ

REVISION REGISTER

XRAM TECHNOLOGIES
63 Sovereign Drive, Route 21, Corporate Park, Centurion 0157
P.O. Box 99350, Garsfontein East, Pretoria, South Africa 0060

DRAWN	E VAN HEERDEN	DATE	2020/11/10
CHECKED	R VAN ZYL	DATE	2020/11/10
APPROVAL			
PROJ. ENG.	J.R de CARVALHO	DATE	
LEAD ENG.		DATE	
PROJ. MNG.	J JACOBS	DATE	
D.O. MNG.	R VAN ZYL	DATE	
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CLIENT: **NEW HORIZON**

PROJECT: **WITVLEI**

TITLE: **PROPOSED CIVIL FOR CUPOLA FURNACE BUILDING**

PROJECT No	SUB DIV	SUBJECT	SERIAL	SHEET	REV
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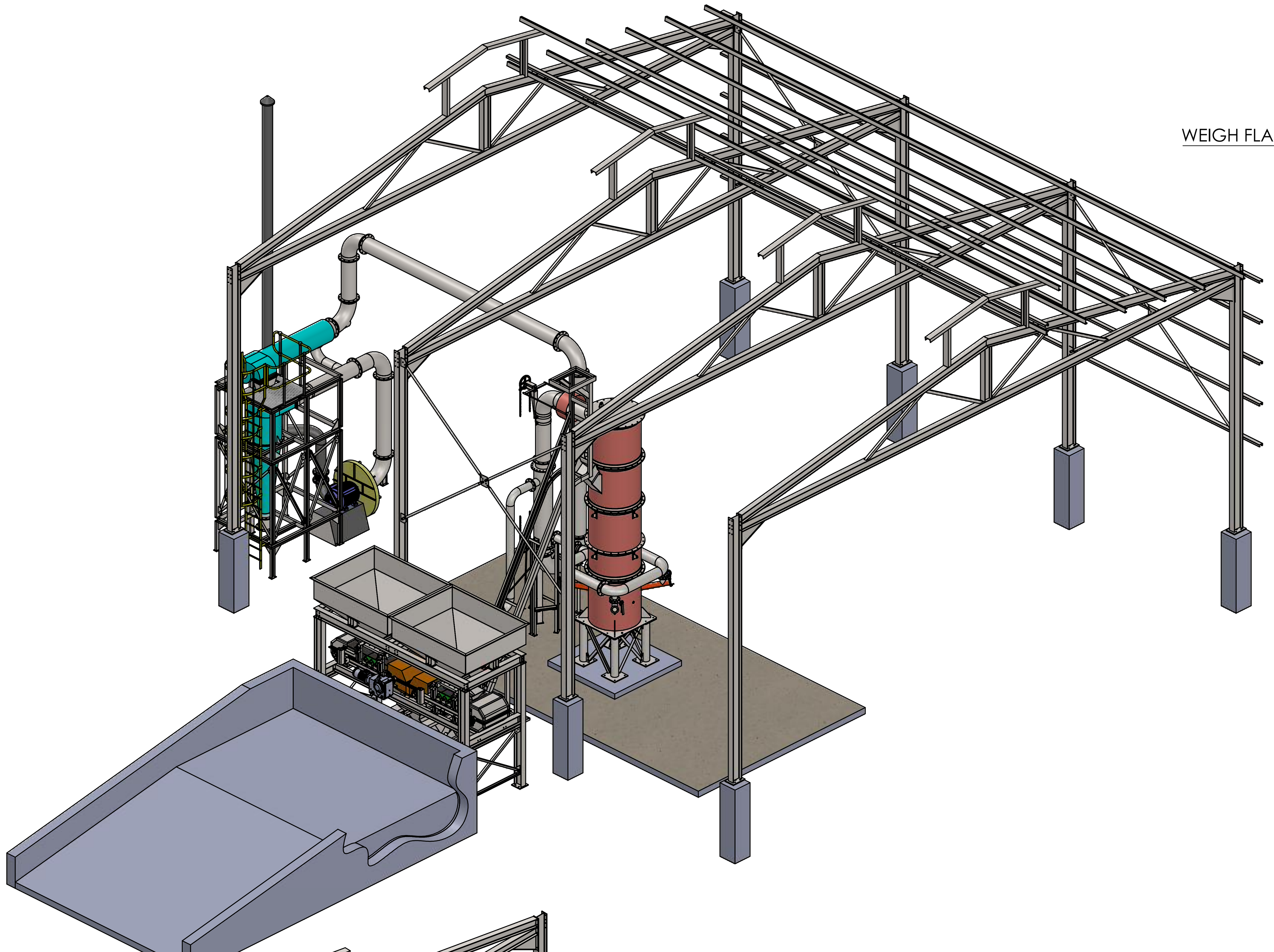

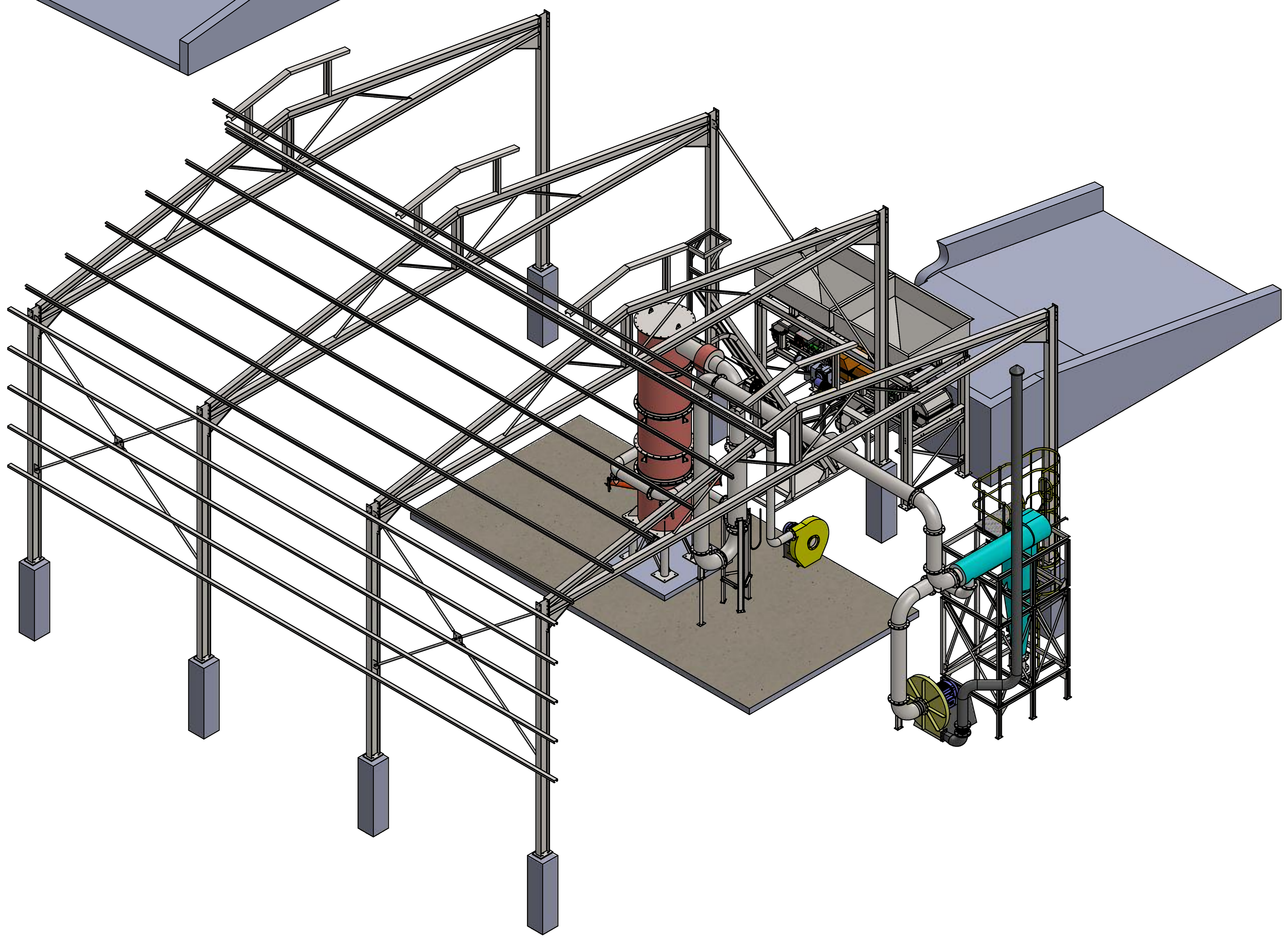

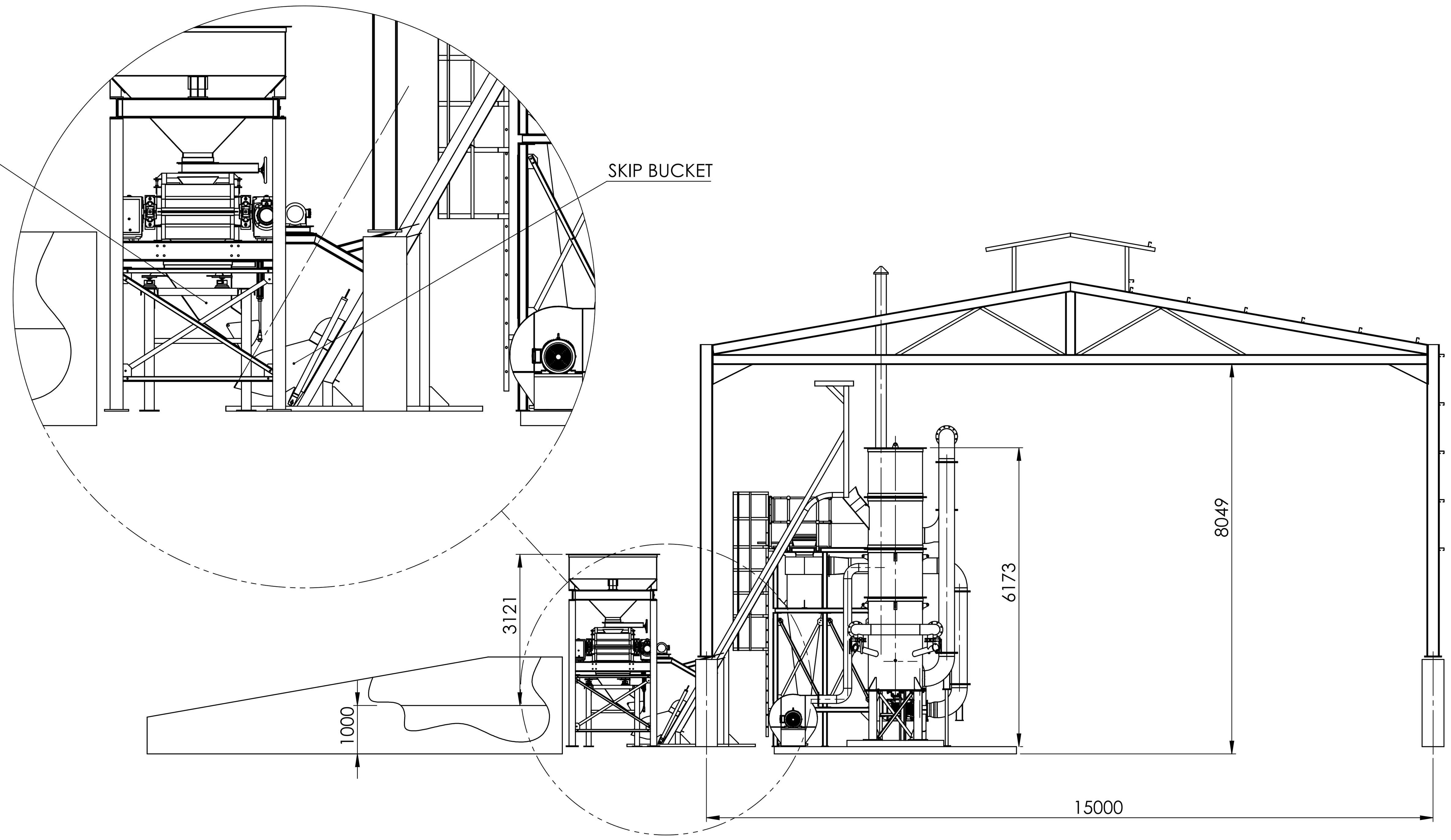

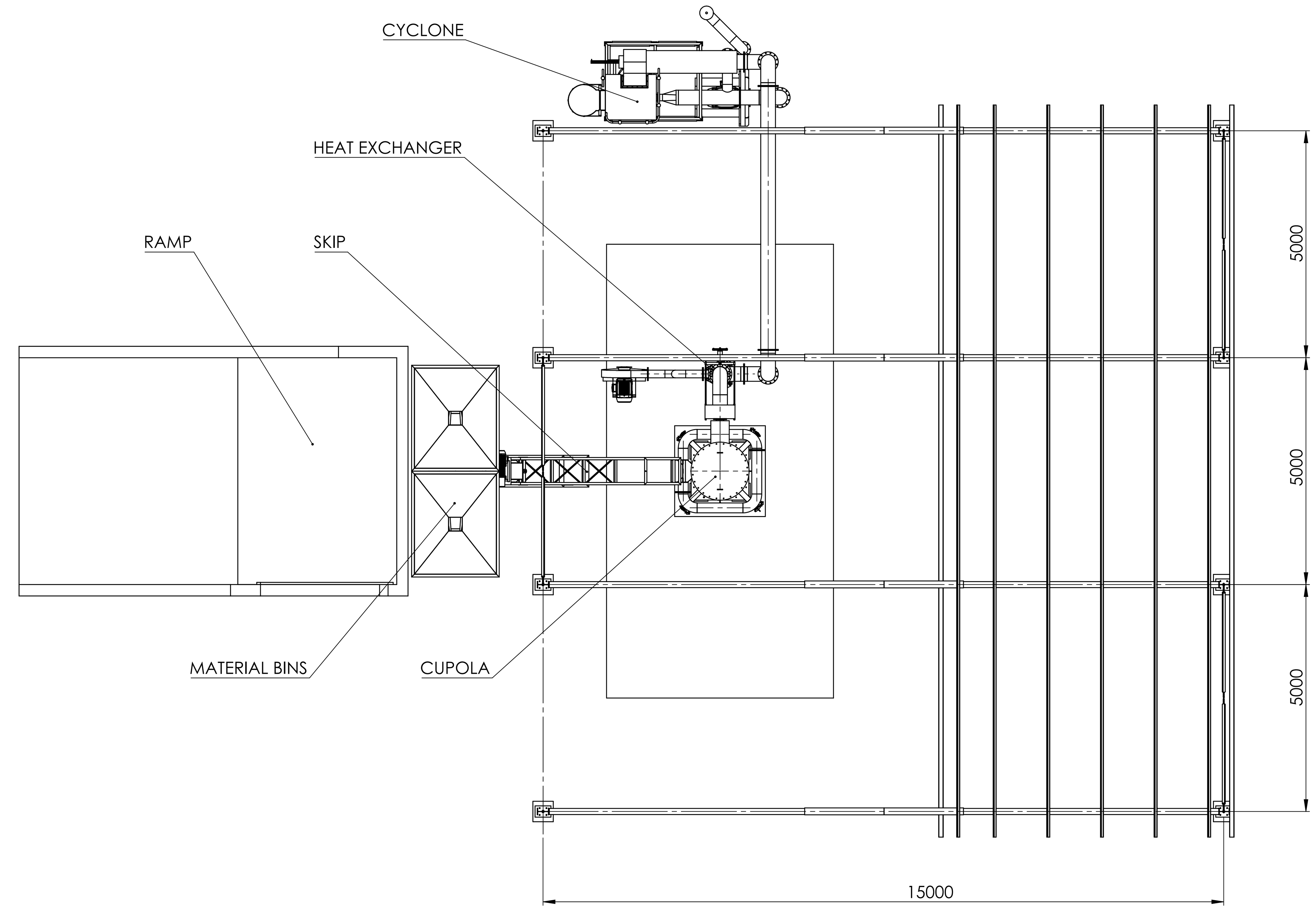

TOP VIEW

REV	DATE	REVISION DESCRIPTION	DRN	CHK	LDE	ENG	DOM
A	2021/02/11	ISSUED FOR INTERNAL REVIEW	EvH	RvZ	JJ	JJ	RvZ

REVISION REGISTER

DRG. NUMBER	DRG. TITLE

REFERENCE DRAWING NO

XRAM TECHNOLOGIES

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Centurion
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Pretoria
South Africa 0060

DRAWN	E VAN HEERDEN	DATE	2021/02/11
CHECKED	R VAN ZYL	DATE	2021/02/11
APPROVAL			
PROJ. ENG.		DATE	
LEAD ENG.	J JACOBS	DATE	
PROJ. MNG.	J JACOBS	DATE	
D.O. MNG.	R VAN ZYL	DATE	

SCALE: 1:80

A1

3RD ANGLE PROJECTION

CLIENT: **NEW HORIZON**

PROJECT: **WITVLEI**

TITLE: **1 - TON CUPOLA BUILDING LAYOUT**

PROJECT No	SUB DIV	SUBJECT	SERIAL	SHEET	REV
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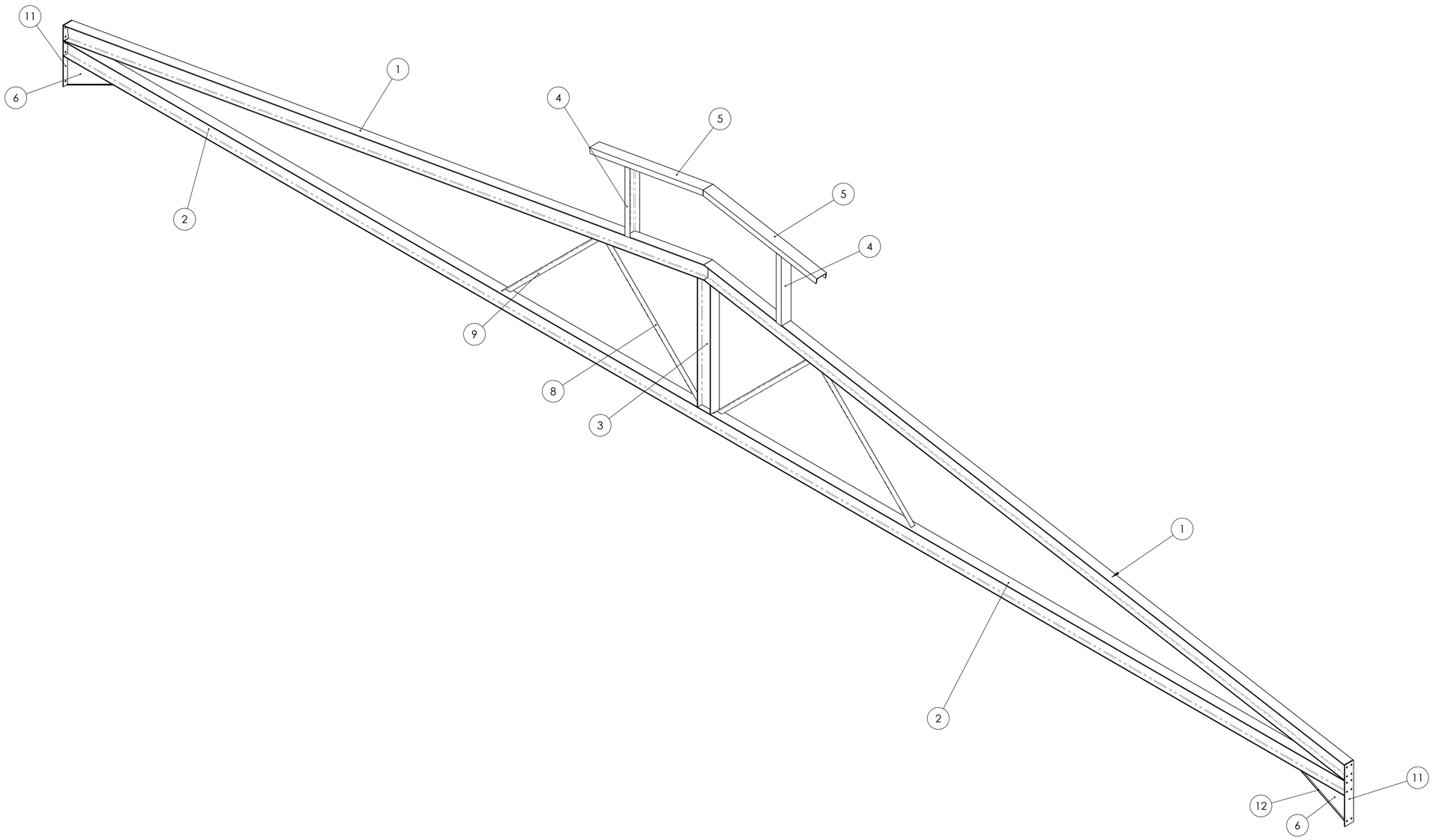

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REFERENCE DRAWING NO

DRG. NUMBER	DRG. TITLE

REVISION REGISTER

REV	DATE	REVISION DESCRIPTION	DRN	CHK	LDE	ENG	DOM
A	2020/09/11	ISSUED FOR INTERNAL REVIEW	EvH	RvZ	JJ	JJ	RvZ

XRAM TECHNOLOGIES
63 Sovereign Drive, Route 21 Corporate Park, Centurion, 0157
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DRAWN	E VAN HEERDEN	DATE	2020/09/11
CHECKED	R VAN ZYL	DATE	2020/09/11

APPROVAL

PROJ. ENG.		DATE	
LEAD ENG.	J JACOBS	DATE	
PROJ. MNG.	J JACOBS	DATE	
D.O. MNG.	R VAN ZYL	DATE	

SCALE: 1:25 | A1 | 3RD ANGLE PROJECTION

CLIENT: **NEW HORIZON**

PROJECT: **WITVLEI**

TITLE: **ROOF TRUSS**

PROJECT No	SUB DIV	SUBJECT	SERIAL	SHEET	REV
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DRAWING NUMBER: X047-H130-S0000-0003

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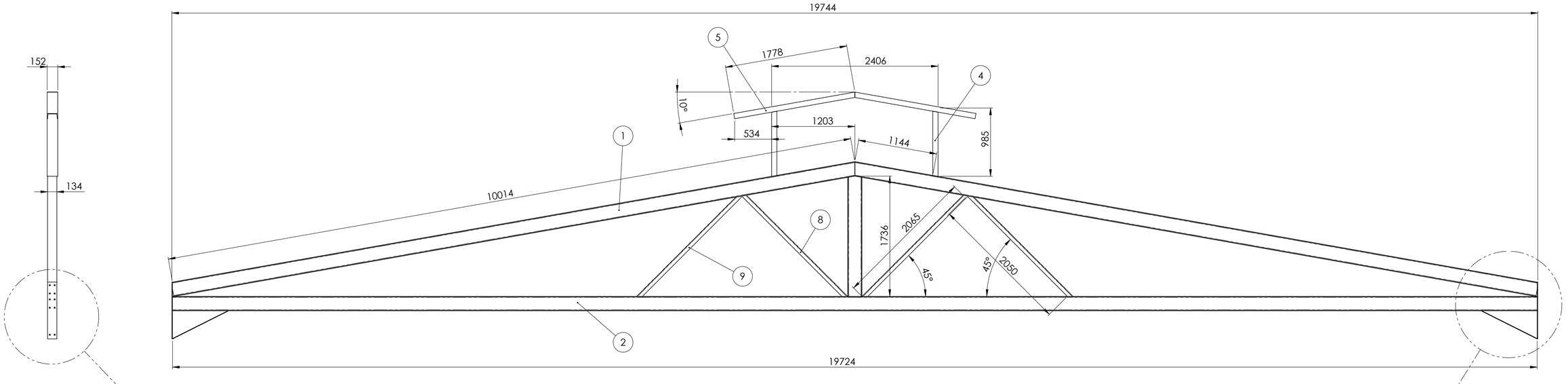

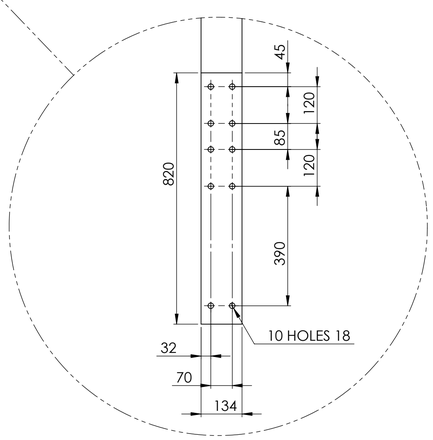

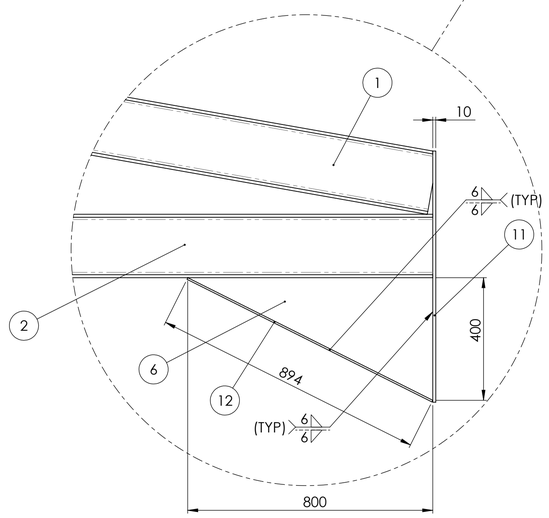

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REFERENCE DRAWING NO		A	2020/09/11	ISSUED FOR INTERNAL REVIEW	EvH	RvZ	JJ	JJ	RvZ

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South Africa 0060

DRAWN	E VAN HEERDEN	DATE	2020/09/11
CHECKED	R VAN ZYL	DATE	2020/09/11

APPROVAL

PROJ. ENG.		DATE	
LEAD ENG.	J JACOBS	DATE	
PROJ. MNG.	J JACOBS	DATE	
D.O. MNG.	R VAN ZYL	DATE	

SCALE: 1:30 | A1 | 3RD ANGLE PROJECTION

CLIENT: **NEW HORIZON**

PROJECT: **WITVLEI**

TITLE: **ROOF TRUSS**

PROJECT No	SUB DIV	SUBJECT	SERIAL	SHEET	REV
X047	H130	S000	0003	2 / 2	A

DRAWING NO: X047-H130-S000-0003

Appendix C: Specialist Studies

1. Air Quality
2. Socio-Economic

Scoping Report: Social and Economic Assessment

[Project Name]
Proposed Copper Smelting Plant at Witvlei]
[Proponent]
New Horizon Investment Group
Date : 13 – May – 2021

1. BACKGROUND & INTRODUCTION

New Horizon Investment Group cc (NHIG) proposes to establish a copper smelting plant at Witvlei (Omaheke Region, Namibia). The smelting technology developed by XRAM, is non-electric, requiring only electrical auxiliary power. Successful smelting tests campaigns have been conducted on Namibian oxide copper in our pilot facility in South Africa. It can deliver modular units of 1 or 5 ton per hour. It is environmentally friendly and can handle oxides and sulfides, but preferably oxide ore. The total project budget is estimated at U$2,200,000.00. The financial resources are to serve the twelve (12) months research and development phase. The proposed project site falls within an industrial area with a spatial foot print of 4.4 hectares. The project investment will be realized through a public private partnership (PPP) of which NHIG has 95% shareholding and 5% share for the Witvlei Village Council.

Understanding the potential socio-economic impacts of project proposed is key to improving the business environment within which the company operate. The project presents an avenue **for redressing** social and economic challenges by focusing on community empowerment, promotion of social and economic integration, building social capital through participative processes and addressing the broader social needs of communities.

During the Research and Development Phase (construction phase), **15 jobs** will be created. Job preference will be given to the unskilled or semi-skilled and youth. The operation phase require **+- 65 permanent** employees. Indirect jobs will manifest due to the out-sourcing of short-term services (maintenance, transportation) to sub-contractors.

"Social impacts" is understood as the consequences to human populations of any public or private actions -that alter the ways in which people live, work, play, relate to one another, and organize to meet their needs. The term also includes cultural impacts involving changes to the norms, values, and beliefs that guide and rationalize their cognition of themselves and their society.

2. PURPOSE OF THIS REPORT

This report preliminarily sets out socio-economic variables significantly associated with the project. The report further serve to detail and guide NHIG on measures that can be adopted in dealing with the potential socio-economic impacts that may arise.

The main objectives of the social and economic assessment are to:

4.1 Make reference to statutory environmental requirements and obligations;

4.2 Identify potential significant socio-economic environmental impacts;

4.3 Set out management approach or recommendations in managing these impacts ;

4.4 Clarify responsibilities of various parties that may be involved;

3. **Policy Statement-New Horizon Investment Group**

The New Horizon investment group firmly embraces and commits to the principles of socio economic development (SED). The group views this as an integral aspect of the development of a broader sustainability policy which includes job creation and skills development. The objectives of Socio Economic development are to provide initiatives that are

aimed at community and rural upliftment. Initiatives are aimed at alleviating poverty, providing education, health care and access to the economy for those individuals and communities that are most in need .In reviewing the Integrated Development Plan the group has identified that one of the priorities for the CoT are: ***Strategic Objective 3****: Sustainable communities with clean, healthy and safe environments and integrated social services*. The group intends achieving the target of 0,05% by addressing the priorities of the CoT as detailed above and will follow a set methodology when assessing the rollout of proposed Socio Economic Development initiatives.

4. Table 1: LEGAL FRAMEWORK: LEGISLATION, POLICIES & DIRECTIVES

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
The Constitution of the Republic of Namibia (1990)	The articles 91(c) and 95 (i) commits the state to actively promote and sustain environmental welfare of the nation by formulating and institutionalizing policies to accomplish sustainable development	The construction and operation of the copper smelting plant can interfere with the ecosystem and overutilization of natural resources like water. Attention should be given to the state of water and other natural resources to avoid over exploitation. By developing and implementing the Environment Management Plan, NHIG is promoting sustainable development.
Environmental Management Act No. 07 of 2007	The Act provides a definition to the term "Environment" broadly interpreted to include biophysical, social, economic, cultural, historical and political components Section 3 (2) (e) states that "assessments must be undertaken for activities which may have a significant effect on the environment Requires for adequate public participation during the environmental assessment process stakeholders to give their opinions about a project (Section 2(b-c)) and issues that may affect them. Environmental justice must be pursued so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons;	The nature of the proposed Witvlei copper smelter plant and interrelated activities potentially causes environmental impacts to the surrounding human population. The development of the copper smelter requires the assessment of all possible environmental and social impacts.

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
EIA Regulations GN 57/2007 (GG 3812)	Details requirements for public consultation within a given environmental assessment process (GN No 30 S21). Details the requirements for what should be included in an Environmental Scoping Report (GN No 30 S8) and an EIA report (GN No 30 S15).	The implementation of the project triggers the need for consultation of all affected and interested stakeholders. A socio-economic assessments should lead and advise the project proponent before implementation. The public participation process is a mechanism for the identification of issues of social and economic concern. A public consultation meeting was held in respect to this and all the concerns and issues were noted and addressed in this report.
	Section 55 "(1) No person may produce, collect, transport, sort, recover, treat, store, dispose of or otherwise manage waste in a manner that results in or creates a significant risk of harm to human health or the environment."	Contractors of the civil works of the project should make it mandatory that they manage their waste in a manner that do not cause environmental threat and risk both to the surroundings and the local communities.
Atmospheric Pollution Prevention Ordinance 11 of 1976	The law regulates and prohibit pollution from industries particularly smoke and dust from various activities. The ordinance considers air pollution from point sources but does not address air quality,	Construction, operational and fugitive dust from processes will most likely affect ambient air quality and affect health of workers at plant.
National Solid Waste Management Strategy	The Strategy listed priorities for the strategy to address for effective solid waste management. The strategy facilitate co-operation between stakeholders	The construction and operation of the copper smelter can potentially generate significant amount of solid waste that might need proper management by contractors to avoid pollution. Waste management plans should be generated and implemented prior the commencement of civil works and during operations.

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
		Waste generated should be stored and disposed in an environmental friendly. The proponent should limit the exposure of waste that present a risk to public health.
Labour Act 11 of 2007.	Empowers the minister responsible for labour to publish regulations pertaining to health and safety of labourers (S135). Details requirements regarding minimum wage and working conditions (S39-47).	The construction and operation of the smelter plant will invite significant amount of laborious work. Therefore, there is need to ensure that proponent without charge to employees provide a working environment that is safe, has adequate facilities for the welfare of employees. Good housekeeping practices are key to preventing fugitive emissions and occupational injuries.
Namibia Development Plan (NDP 5)	NDP5 revolves around the pillars of: 1) economic progress, 2) social transformation, 3) environmental sustainability, and 4) good governance. The current development plan **(NDP5)** emphasizes the need for skills training and tackling youth unemployment. **Social Transformation Pillar:** The Goal for this pillar is to build capable and health human resources. Quality human capital is crucial to optimizing productivity and associated socioeconomic benefits to citizens.	Ensuring workers access to quality health care. In consultation with community, it's imperative that youth participation be mainstreamed in the project.
Health and Safety Regulations GN 156/1997 (GG 1617)	Details various requirements regarding health and safety requirements of the smelter plant.	-Occupational health and safety provisions during construction and operational phases should be clearly outlined. -Compliance monitoring and assigning responsibilities for compliance monitoring is a pre-requisite for managing an industrial installation.

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
Public Health Act 36 of 1919	Section 119 states that "no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health."	Compliance to the Public health Act will be ensured in relation to the following: -Provision of adequate sanitation -Provision of personal protective clothing -Prevention of Communicable diseases -Emergency healthcare provision
Public and Environmental Health Act 1 of 2015.	To provide a framework for a structured uniform public and environmental health system in Namibia; and to provide for incidental matters.	
National Action Plan on Health Security (NAPS) 2021 TO 2025	The Plan aim to facilitate multi-sectoral engagement using the One Health approach and to guide implementation of activities for progress towards the attainment of the International Health Regulations (IHR) 2005 core capacities for the country.	Engagement on Community Health and Partnerships

5. **HISTORICAL CONTEXT**

Witvlei is historically significance as it is the place where the first battle (*Battle of Witvlei*) took place during the Herero-Nama War in March 1864. Witvlei is a village council and district capital of the Okarukambe Constituency. The modern Witvlei came into existence in 1952.Today the Council of the Village constitute five (5) members representing the local residents.

6. DEMOGRAPHICS & CULTURE & LITERACY

Based on the National Housing Census of 2011, the Witvlei population is estimated at 1683. It is estimated that there are about 800 households at Witvlei. Given the growing households population, it is projected that there are about 3440 residents, assuming a household size of 4.3 people (NHIES,2015). Farm workers from surrounding farms frequent Witvlei regularly with the hope of settling there.

Witvlei is a multi-ethnic place with people of many cultures living together with a variety of lifestyles and intercultural affiliations (Klocke-Daffa, 2012. Most of the inhabitants of Witvlei are of Damara descent, but there are Ovambo, Herero, Kavango, and inhabitants of mixed ethnicity. The literacy rate for the age group between 15 and above is estimated at 71.8%. The literacy rate for the age group between 15 and above is estimated at 71.8%.

7. ECONOMIC CONTEXT

The Omaheke regional contribution to the National GDP cannot be underscored. The regional economy continues to be dominated by three (3) economic drivers i.e. livestock production, transportation and logistics. Economic growth in the region creates a positive feedback loop. The Draft Omaheke Regional Development Plan (2017/2018 to 2021/2022) place emphasis on the need economic advancement. Increasing economic opportunities is pivotal to economic advancement. The latter objectives is imperative given the regions severe poverty rate which is above the national average of 10.7%.

The economically active population in Omaheke is estimated at 65 percent, 42.3 percent of which is unemployed. About 45 percent of the employed population is in the agriculture sector. Tourism accounts for 5 percent of the employed population in the region, while manufacturing and logistics each account for 2 percent. Construction is a key sector, yielding about 7 percent of the region's employment.Also, National labour Survey (2018) revealed a 46.6 percent unemployment rate amongst the youthful age group (15 to 34 years).

Major employment is primarily tied to the public service sector such as Education (primary school, Fig 8), Health (clinic), and Policing (police station, adult education office, Social Protection (Ministry of Gender Office), postal services (NamPost) and local administration (Witvlei Village Council). Significant investments made in the in the past at Witvlei includes the Witvlei Abattoir), Leap clothing factory, Taxidermy, Charcoal processing plant which provides employment for the betterment of local community. The closure of abattoir in 2014 resulted in significant number of jobs being lost. Prior to closure, the abattoir employed 165 people, which made it the biggest employment provider at the time. A large segment of residents have permanent and seasonal employment at farms adjacent to Witvlei.

The monetary resources people have at their disposal are extremely small such that little or nothing is left for investment. Most Witvlei residents have to manage with extremely small amounts of cash of less than 5 N$ per day for most days of the month. Many persons prefer to buy on credit as a means of bridging temporary financial difficulties or postponing their expenses for groceries in favor of other financial obligations (Klocke-Daffa 2012). Unemployment, housing and HIV and Aids are issues the Council has to deal with at the settlement. The Village Council is ready to take on any challenge but will need more assistance in terms of capacity and skills development for the implementation of policies like HIV & gender.

8. CIVIC INFRUSTRUCTURE- LEVEL OF SERVICES

8.1 Housing

There are 400 serviced erven with formal housing units and 500 erven comprising of semi-formal housing and informal structures. Table 1 below depict the extend of land delivery and housing

Table 2: Development of services of erven

Name of Township	No. of Erven	Service
1. Witvlei Proper	400	Serviced
2. Mataura	250	Partly Serviced
3. Informal Area	250 (est)	Un-serviced

8.2 Water supply

Water supply at Witvlei can be prescribed as secure. Three (3) boreholes serve Witvlei. An existing water reservoir with a capacity of 3000 m³ is situated south of the proposed smelter. Safe drinking water is available to most households. The water requirement for the smelting plant would requires potable water for cooling 33 m³ litres daily assuming a 22 hour cycle. The proposed development is not expected to threaten water security at the settlement. About 66.4 % of households have water inside the yard. Electricity and water supplies are often cut for noncompliance to payments. In this case women are most affected.

8.3 Sanitation

The provision of adequate sanitation remain a challenge especially in the informal area (Section 72 and Section 77). No full sewer reticulation system exist. Sanitary provision take the form of septic tanks and pit latrines. Approximately 49 % of households are not covered with toilet facilities. Sewage removal services area primarily confined to two areas, namely Witvlei Proper and Mataura. A new sewer reticulation system is being constructed on the southern side of Witvlei (Mataura) and will be linked with the formal area. Access to basic sanitation is primarily associated with the formal housing segment.

8.3 Energy

Energy access at Witvlei can be equated to that of the Region. According to the National Census Report (2011), approximately 73% of the communities in the Omaheke use wood/charcoal for cooking and heating and only 33% use electricity. Firewood (Fig 1) is a common source of energy especially amongst the low income groups. A 66kv Nampower substation and line (Fig 2) is situated north of proposed site with electrical connections linked to formal housing. The electricity demand for the copper smelting plant is 380 V 3 phase. The process plant requires 67 kWh during and will operate 22 hours daily.

Fig 1: Wood harvesting

Fig 2: Powerline adjacent to proposed project site

8.5 Roads

The only road segment of bitumen standard is the Trans Kalahari Highway (Fig 7&8) on the B6 National Road passing through Witvlei. The predominant and remaining road network at Witvlei is gravel.

8.6 Health Facilities

Health services are available with one (1) clinic (Fig 3) serves the local populace. With interacting with the locals, it was found out that respiratory related disease and blood pressure is common. The latter is consistent with the broader regional data (NHIES, 2015) as chronic illness likely to be most prevalence rate include high blood pressure followed by respiratory diseases. Witvlei does not have any doctors and no general pharmacy.

Fig 3: Witvlei Health Clinic

Table 3: Types of chronic illness in the population by region and urban/rural areas

Region	Type of chronic illness															
	Diabetes	High blood pressure	Joint inflammation	Cancer	Cardiac / Heart	Epilepsy	Respiratory disease (asthma, etc.)	Stomach ulcer	Chronic kidney disease	Anaemia	Chronic mental/ psychological illness	Other	Does not have a chronic illness	Not stated	Total	Population
	Percentage															
Namibia	**0.8**	**6.1**	**0.9**	**0.2**	**0.8**	**0.5**	**1.0**	**0.3**	**0.1**	**0.1**	**0.4**	**0.6**	**88.2**	**0.0**	**100**	**2 280 716**
Urban	**1.3**	**6.4**	**0.6**	**0.2**	**0.7**	**0.4**	**1.2**	**0.2**	**0.1**	**0.2**	**0.2**	**0.7**	**87.6**	**0.1**	**100**	**1 068 625**
Rural	**0.4**	**5.8**	**1.1**	**0.1**	**0.8**	**0.7**	**0.7**	**0.3**	**0.1**	**0.1**	**0.6**	**0.5**	**88.6**	**0.0**	**100**	**1 212 091**
!Karas	1.8	7.9	0.5	0.1	0.4	0.8	0.9	0.3	0.0	0.1	0.2	0.4	86.5	0.0	100	84 077
Erongo	1.6	7.7	0.5	0.2	0.4	0.3	1.9	0.1	0.1	0.1	0.2	0.5	86.2	0.0	100	175 853
Hardap	1.9	8.1	1.0	0.4	0.7	0.7	1.7	0.3	0.2	0.0	0.2	1.1	83.5	0.0	100	85 629
Kavango East	0.2	4.1	0.6	0.1	1.9	1.1	0.7	0.5	0.1	0.2	0.7	0.4	89.4	0.1	100	146 151
Kavango West	0.3	5.2	1.0	0.1	1.0	0.6	1.1	0.5	0.4	0.3	1.3	0.6	87.5	0.1	100	88 705
Khomas	1.0	6.4	0.6	0.3	0.8	0.3	1.3	0.3	0.2	0.2	0.1	1.0	87.5	0.1	100	400 191
Kunene	0.8	5.2	1.1	0.2	0.8	0.8	0.8	0.3	0.1	0.2	0.6	0.9	88.2	0.0	100	95 610
Ohangwena	0.4	4.7	1.1	0.1	0.5	0.4	0.3	0.3	0.0	0.2	0.7	0.1	91.3	0.0	100	253 348
Omaheke	1.5	9.1	0.7	0.1	0.7	0.5	2.2	0.1	0.0	0.0	0.1	0.5	84.3	0.2	100	74 040
Omusati	0.4	5.6	0.8	0.2	0.5	0.9	0.6	0.3	0.0	0.1	0.6	0.7	89.3	0.0	100	248 490
Oshana	0.5	5.2	1.1	0.2	0.5	0.4	0.4	0.3	0.1	0.0	0.6	0.6	90.1	0.1	100	186 634
Oshikoto	0.4	6.1	1.5	0.1	0.7	0.4	0.4	0.2	0.1	0.2	0.5	0.4	88.9	0.0	100	192 469
Otjozondjupa	1.2	7.4	1.2	0.2	1.0	0.5	1.1	0.1	0.3	0.1	0.4	0.4	85.9	0.0	100	152 343
Zambezi	0.9	5.0	1.0	0.2	0.8	0.7	1.1	0.2	0.4	0.2	0.3	0.2	88.9	0.0	100	97 176

9. STUDY METHODOLOGY

9.1 Issue identification

Consultation with Interested and Affected Parties (I&APs) is an integral element of socio-economic study .The public participation process served to provide I&APs with an opportunity to raise concerns and issues relating social and economic. Social and Economic issues were collected through the public consultation meeting held on the 16 March 2021 at Witvlei (Minutes Annexed). At the said meeting, CPC cc and NHIG provided feedback on issues and concerns raised by I&APs. This was further achieved through personal interviews held political leaders, residents and representatives of state agencies. A questionnaire was also to garner stakeholder views. Informal consultations occurred with personnel of the Witvlei Village Council. Based on the consultations held the following impact variables were deemed significant.

9.2 Significance of impact

Significance of the identified ***Socio Economic Impacts*** for the proposed development was assessed using the criteria discussed in Table 4 below.

Table 4: Criteria used to determine the significance of impacts and their definitions.

CRITERIA	DESCRIPTION
NATURE	This criteria indicates whether the proposed activity has a **positive** or **negative** impact on the environment (environment comprises both socio-economic and biophysical aspects).
EXTENT	This criteria measures whether the impact will be site specific; local (limited to within 15 km of the area); regional (limited to about 100 km radius); national (limited to within the borders of Namibia) or international (beyond Namibia's borders).
DURATION	This criteria looks at the lifetime of the impact, as being short (days, less than a month), medium (months, less than a year), long (years, less than 10 years), or permanent (more than 10 years).
INTENSITY	This criteria is used to determine whether the magnitude of the impact is destructive and whether it exceeds set standards, and is described as none (no impact); low (where the environmental functions are negligible affected); medium (where the environment continues to function but in a noticeably modified manner); or high (where environmental functions and processes are altered such that they temporarily or permanently cease).
PROBABILITY	Considers the likelihood of the impact occurring and is described as improbable (low likelihood), probable (distinct possibility), highly probable (most likely) or definite (impact will happen regardless of prevention measures).
DEGREE OF CONFIDENCE IN PREDICTION	This is based on the availability of information and knowledge used to assess the impacts.

The significance of the potential impacts identified for this project were determined using a combination of criteria discussed on the above table.

The level significance of impacts is described in the table below.

Table 5: Definition of the various significance ratings

SIGNIFICANCE RATING	CRITERIA
Low	Where the impact will have a negligible influence on the socio-environment and no mitigations are required.
Medium	Where the impact could have an influence on the socio-economic environment, which require some modifications on the proposed project design and/or alternative mitigation.
High	Where the impact could have a significant influence on the socio-environment and, in the case of a negative impact, the activity causing it, should not be permitted.

10. ASSEMMENT OF POTENTIAL IMPACTS

10.1 Demography

Witvlei is generally characterized as having a low migration effects. This can be attributed to a slow development trend and economic growth over time. The tourism potential is relatively small given the limited amenities found in Witvlei. The project may trigger a slight increase in tourism related activities due to the influx of job seekers, their families and experts during various phases of project. People interested in the new development will travel to Witvlei. With the influx, a 30% population growth is expected. With Witvlei being on the Trans Kalahari, it is expected that some of these travellers can be attracted by investments driven by the operation of smelter. However the surrounding farms present an opportunity for growth in tourism sector given the anticipated rise.

As a response, fast tracking tenure rights can enhance the concept of local citizenship, incorporating both rights and obligations locals. With the Smelter, its least expected that there will be balance between of inbound and outbound migration. The **impact** of project on migration (regional level) is regarded to be of high **significanc**

Table 6: Expected significance of the project on migration

Criteria	Health
Extent	*local*
Duration	*long to permanent*
Intensity	*medium*
Probability	*definite*
Significance before mitigation	*high*
Significance after mitigation	*high*

10.2 Impact: Health

.Potential impacts on public health can possibly be attributed to atmospheric emission from project related activities. Also, there are some potential health risk to employees which requires attention, mitigation, and management. During the construction phase dust will be generated onsite by earth moving equipment and also on the gravel road by trucks and mini- vehicles. On site, overburden materials will be removed and dust generated could be inhaled by the workers. Epidemiological studies indicate that workers exposed to dust stand an increased risk of suffering from asthma symptoms, chronic bronchitis, nasal inflammation and impairment of lung function (Camici et al., 1978; Angotzi et al., 2005; Leikin et al., 2009). Affected workers can have body problems like headache, backache and stress. Also long period of chronic exposure to dust induce progressive atrophic changes in the alveoli (Gammal et al, 2011).

Vehicular emission in relation to an increase in traffic volume may impact the community negatively placing a burden on the health systems due to the concentration of people in the area. Negative impacts due to an increase in traffic volume are expected not to arise, as traffic (directly linked to smelter) will largely be limited to service road (Fig 1) which currently remain underutilized by a large segment of the Witvlei population and other public road users.

Noise levels in areas proximate to smelter are likely to increase. Key activities that are highly likely to generate noise and adversely affect occupational health and safety include site preparation, earth works and an increase in vehicle movement. Noise exposure to general public is anticipated to be minimal and confined to those working at the smelter plant. The HIV prevalence rate is expected to change due to immigration. The HIV prevalence rate of 8.4 % is expected amongst adults of the age group 15 to 64 years.

To prevent respiratory or other problems caused by exposure to dust, engineering control methods and the use of tools that minimize the generation of dust should be introduced. The overall primary health care system will not be negatively affected as the proponent plans to construct a health facility (clinic) to take care occupational injuries and primary health care needs of workers and their respective families. Altogether the balance of positive and negative impacts can be regarded to be non- neutralizing, thus rendering health impact to be regards as **highly** significant.

Table 7: Expected significance of the project on public health

Criteria	Health
Extent	*local*
Duration	*long to permanent*
Intensity	*medium*
Probability	*definite*
Significance before mitigation	*high*
Significance after mitigation	*medium*

10.3 Impact: Human capital development/skill transfer

The presents of high level experts during the initial phase of project holds great potential for facilitating skill transfer as a major share of those to be employed will be unskilled. Broadly, the level of education is expected to increase via on the job training for those in full time employment and those in direct employment of contractors. Hence a diverse skill set of workers is projected e.g. plumbers, electricians, bricklayers. Growth in the local housing sector is anticipated due to increase demand for housing amongst those in direct employment. A broad skill base can a positive impact on formal housing and upgrade of informal settlement and servicing of erven. The proponent provisionally secured an erf for a housing development from the WVC. The latter would thus trigger a demand for construction material (bricks. The contribution of proposed development towards skill enhancement represents a positive impact that can be characterised as of **high** significance.

Table 8: Expected significance of the project on skill transfer

Criteria	Skill transfer
Extent	*local*
Duration	*long to permanent*
Intensity	*medium*
Probability	*definite*
Significance before mitigation	*high*
Significance after mitigation	*high*

9.4 Impact: Employment creation

Highly skilled workforce may be sourced from the broader region. An increase in number of those employed is anticipated with a corresponding rise in income levels for those involved in informal trading activities, as well as those involved with various businesses that sell products and services as a result of smelting plant and associated activities. Under the assumption that the lifetime of the Smelter will be around **25 years.** Approximately **500 residents** are expected to benefit incrementally (directly or indirectly) and over various phases of project. The **positive impact** of job creation is assessed to be of **high significance** due to the high unemployment rate at Witvlei and particularly amongst the youthful group of the population.

Table 1: Expected significance of the project on employment

Criteria	Employment
Extent	*local*
Duration	*Short to permanent*
Intensity	*medium*
Probability	*definite*
Significance before mitigation	*high*
Significance after mitigation	*high*

10.3 Local Development & Social Upliftment

The Witvlei Village Council has a 5% share in NHIG. These shares are for the benefit and upliftment of the Witvlei community. A board will be created to oversee the implementation of social uplifment plan (socio-economic development plan). Board members will ensure that the funds received from the 5% net profit are not mismanaged. The location of project at close proximity to Witvlei community can have far reaching impacts on improving household income and reduction of poverty.

10.4 Impact: Informal Economy & Diversification

The development offers an opportunity in effecting growth of the informal economy. The impact is largely to be felt amongst the poor population segment of community or those who cannot find steady jobs. When compared to all other Regions of Namibia, informal unemployment in Omaheke is ranked lowest i.e 6,964 people, NLS (2018). Growth predicted can excite Witvlei economic policy reforms. Policy reforms adopted at local level can influence the behavior of the informal economy as informal enterprises upgrade to formal enterprises. The impact of development on the growth of informal businesses is thus anticipated creating a favorable environment for transforming informal business into formal and sustainable micro enterprises.

Witvlei ranks low and falls within the category of least of developed local authorities in Namibia. Past investments made in developing local infrastructure is conducive for investments and growth. Establishing the smelter plant can stimulate the Witvlei economy. Further positive output of the project is the improvement of societal welfare. It is estimated that the positive effects of the project will increase the revenue collection ability of the local authority and capacity of household's to pay for utilities and services offered by the Village Council. Enhanced standards of living are expected to be felt at household level.

Fig 4: Informal Trading

Changes in the industrial landscape are anticipated as a result of support industries and supply chain networks. For example enterprising initiatives that can be embarked upon is commercialization of slag for use in geotechnical, building and industrial applications. Already, the use of slag in the road construction industry is gradually gaining significance world wide. The **positive impact** of smelter and its contribution towards informal economy and economic diversification is regarded to be of medium significance.

Table 2: Expected significance of the project on <u>Income diversification</u>

Criteria	Income diversification
Extent	*local*
Duration	*Short to permanent*
Intensity	*medium*
Probability	*definite*
Significance before mitigation	*medium*
Significance after mitigation	*medium*

10.5 Pressure on Community Resources

The smelter would not warrant the expansion of auxiliary infrastructure besides the already existing electric, roads and water infrastructure.

11. List of Socio-Economic Variables

Table below list socio-economic variables that were identified during various levels of consultation with stakeholders and comments registered during the commentary period (March 16, 2021 to 31 March 2021). The variable are anticipated to be directly or indirectly related to the proposed project.

Table 11. Matrix Relating Project Social Impact Assessment Variables

Impact Matrix				
	Project Phase			
Social Impact Assessment Variable	**Planning**	**Implementation/ Construction**	**Operation/ Maintenance**	**Decommissioning/ Abandonment**
Population Characteristics				
Population Change	M	M	H	M
Ethnic and racial distribution	M	M	M	M
Relocated populations	M	M	M	M
Influx or outflows of temporary workers	H	H	H	M
Seasonal residents	H	H	H	M
Community and Institutional Structures				
Voluntary associations	M	N	N	M
Interest group activity	M	N	N	M
Employment/income characteristics	M	H	H	M
Employment equity of minority groups	M	H	H	M
Local/regional/national linkages	M	M	H	M
Industrial/commercial diversity	M	H	H	H
Presence of planning and zoning activity	M	M	M	M
Political and Social Resources				

Distribution of power and authority	N	N	H	H
Leadership capability and characteristics	N	N	N	N
Individual and Family Changes				
Perceptions of risk, health, and safety	H	H	M	M
Trust in political and social institutions	N	N	M	N
Residential stability	N	N	N	
Attitudes toward policy/project	H	H	N	H
Family and friendship networks	M	M	M	
Concerns about social well-being	M	M	N	H
Community Resources				
Change in community infrastructure	N	N	N	H
Land use patterns	N	N	N	N
Effects on cultural, historical, and archaeological resources	N	N	N	N

12. MANAGEMENT RECOMMENDATIONS

In response to the socio-economic impacts anticipated, it is recommended that NHIG adopts a myriad of measures aimed at redressing the socio-economic challenges. These measures shall be governed within a framework. The following management recommendations (Table 8) are deemed significant for the effective redress of socio-economic issues and impact identified during the environmental impact assessment process.

Table 12: Proposed Management Recommendations

The following management recommendations are proposed. They are however not exhaustive.

Impact Variable	Stakeholder Comments /Queries/Concerns	Actualization Phase	Action Proposed
Perceptions of risk, health, and safety	• What guarantees are there that the community won't be exposed to air emissions? • What is the negative Impacts on the environment-in Dust and which Technology is used to solve this? • There are negative effects of the project and this should not be allowed if the negative impacts are present, such as pollutants, acid rain and unclean water.	Planning, Construction & Operation	• Medical Surveillance • Occupational Health & Safety Plan • Built Health Facility for workers and families • Promote environmental hygiene • Provide occupational therapy • Establish dust monitoring framework • Make efforts to collaborate with various stakeholders(District Health Teams to jointly achieve desired results outcomes on community health • Coordinate Emergency Drills in-conjunction with Local Service Providers(Police, Ambulance Services)
Attitudes toward policy/project	• Are there other parties who can independently verify all the information on the project? • I would suggest that the proponent create a trust account to cater for the health needs of the workers • Are there other parties who can independently verify	Planning, Construction, Operation	Implement Socio-Economic Development Initiatives

	all the information on the project? • It will be good for the community		
Employment/income characteristics Employment equity of minority groups	• It is the first time such a project of Smelter is being heard in the town, so it is welcomed indeed and it will surely bring opportunities in the town and it shall reduce theft and unemployment • How many people from Witvlei shall be employed? • We need jobs	Planning, Construction, Operation, Decommissioning	• **Stakeholder Engagement**: Ensure that representative committees are formed and that they create performance in relation to local employment creation • Community Liaison
Local Initiatives	NHIG aims to retain the Socio Economic Development Commitment by supporting and developing community initiatives based in Witvlei.	Construction, Operation, Decommissioning	Initiate project and programmes in consultation with the Witvlei Village council and implement to achieve the following Socio Economic Development obligations: • Health and Wellness Programmes • Education, Training and Youth Development • Environmental initiatives • Sustainability programmes • School and community centre programmes

NHIG shall adopt a coherent approach for the management of social risks identified.. Continual improvement shall remain an integral and fundamental principle in the development and implementation of social development plan. A generic or conceptual approach that can be followed is outlined below:

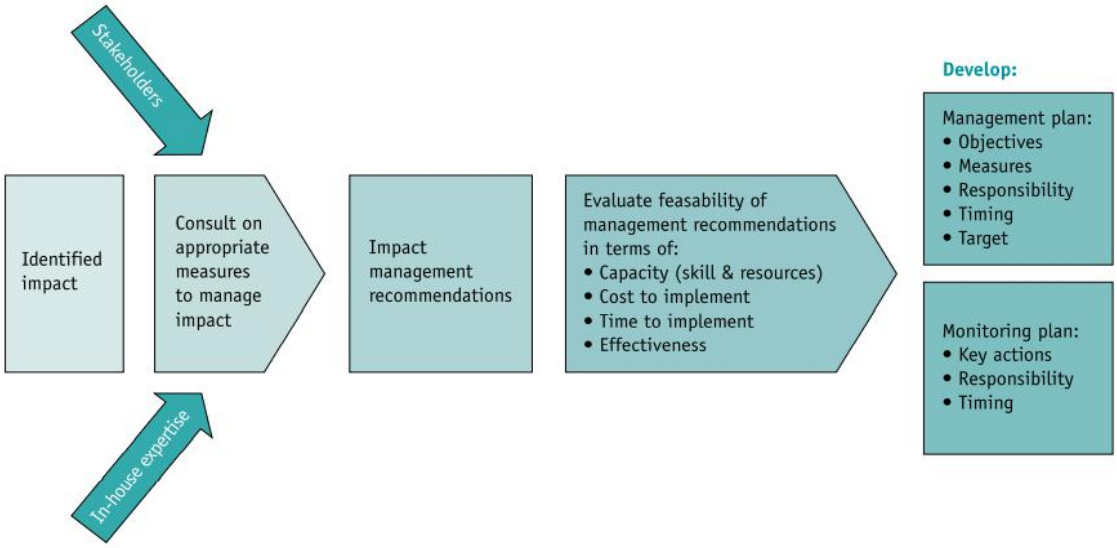


Fig 5: Flow Diagram: Social Development Plan Development: Source Anglo American Socio-Economic Assessment Toolbox (SEAT

The development and implementation of social development plan or framework shall encompass the following elements.

COLLECTION OF BASELINE INFORMATION

Demographic: Determine the following:

- Age of population
- Skills level and educational levels (school attendance by youth)
- State of health (prevalence of HIV/AIDS and related diseases)
- Rates of employment, unemployment and economically active population
- Number of people per household and average income

Geographic

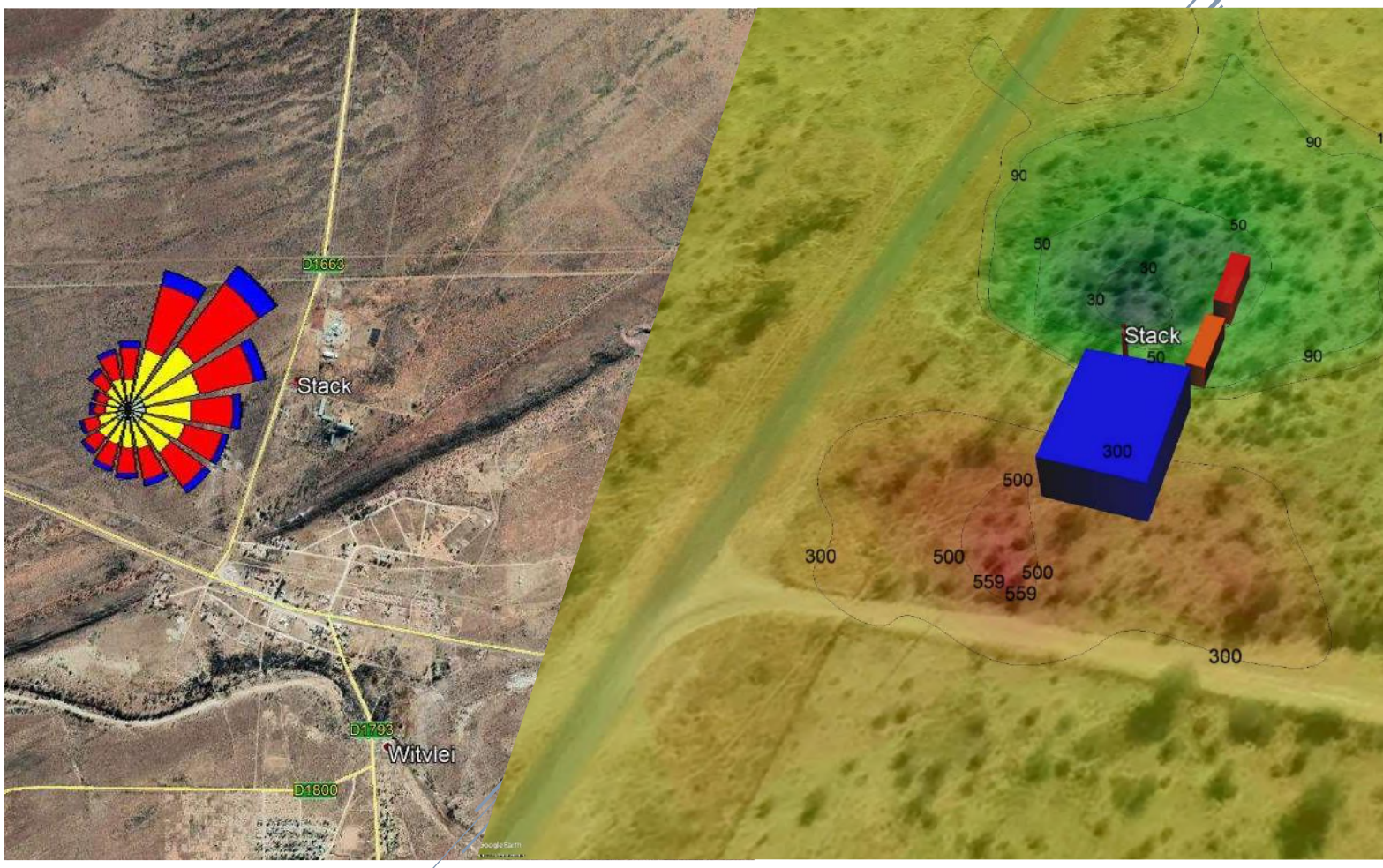
- Determine the state of infrastructure developments
- Access to running water (communal taps, taps in houses etc.)
- Access to housing (types of housing available- RDP or traditional structures)
- Sewerage and sanitation
- Access to roads and transport facilities
- Electricity and communication lines (Telkom vs. Cellular Usage)
- State of educational facilities (# of Schools, Colleges, Universities etc.)

STAKEHOLDER ENGAGEMENT:

Engage the following stakeholders and determine their goals:

- Ministries (Public Works, Transport, Health, Education etc.)
- Regional Government and National Government
- Community Leaders, NPOs and NGOs

Report on
Atmospheric Dispersion Modeling of Proposed Construction and Operation of Copper Smelter Plant at Witvlei – Omaheke Region



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PROJECT INFORMATION

Document Title	Atmospheric Dispersion Modeling of Proposed Construction and Operation of Copper Smelter Plant at Witvlei – Omaheke Region		
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1. INTRODUCTION

1.1 Project Overview

The air quality dispersion modelling study is undertaken to assess air emissions from 667 ton/year capacity of Witvlei Copper Smelter Plant – Omaheke Region. The proposed copper smelter plant is designed for non-electric smelting of copper oxide ore and is a low-cost alternative to smelting copper in an arc furnace. The raw materials are sized prior to deliver to site. Air emissions are expected during the smelting processes such as charging and tapping. Therefore, emission control technologies have been applied at smelter plant to minimize air emissions as well as capture and remove emissions.

The main objectives of the study were to establish the expected emissions from the plant and assess the air quality impacts of the emissions on the surrounding areas. Consequently, the study involves the following tasks: 1) Emissions Inventory Development, 2) Background Air Quality Analysis, 3) Meteorological and Air Dispersion Modelling.

1.2 Project Location

The proposed smelter is sited at Portion A of Farm Okatjirute No. 155, Witvlei - Omaheke Region: Namibia. The proposed plant will be built on an empty block between Abattoir and abandoned Charcoal Processing Plant.

The plant is situated at the UTM location (34 K, 241824.00 m E, 7520906.00 m S). The corner coordinates of the plant site are shown in the Table 1.1 with a total area of approx. 47,406 m^2.

A satellite image of the site obtained from Google Earth is shown in Figure 1.1 to 1.3.

Table 1-1: Co-ordinates of the Copper Smelter Plant Witvlei

Point	Easting	Northing
A	241838.00 m E	7521042.00 m S
B	242098.00 m E	7520989.00 m S
C	242027.00 m E	7520816.00 m S
D	241783.00 m E	7520865.00 m S

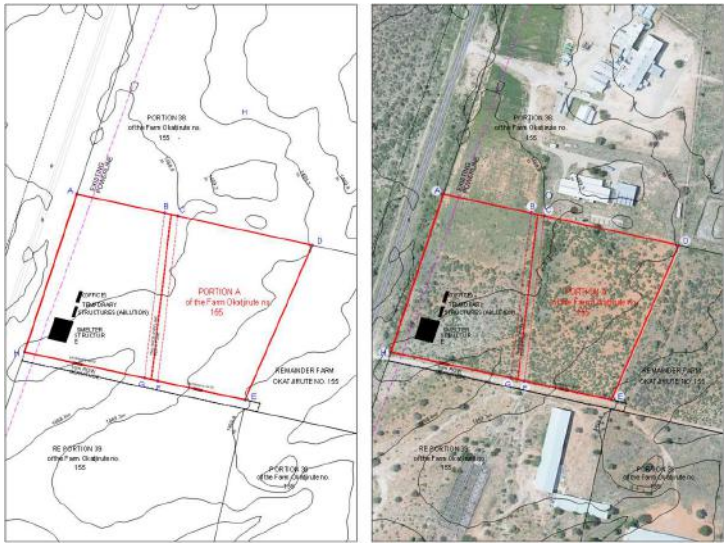


Figure 1-1 The Site Plan of Witvlei Copper Smelter Plant

Figure 1-2: Project Area of Witvlei Copper Smelter Plant

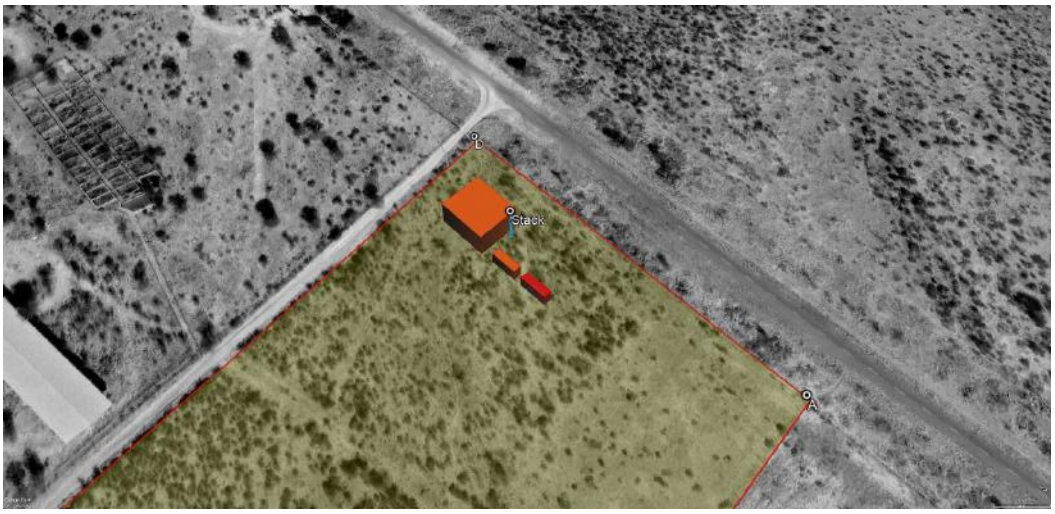


Figure 1-3: Arial View of the Site Plan of Witvlei Copper Smelter Plant

1.3 Project Overview

1.3.1 Site Infrastructure Auxiliary Infrastructure

Auxiliary infrastructure includes services and potable water availability. Services include electrical power supply for auxiliaries (380V, 3-phase) and potable water for evaporative cooling injection. Site infrastructures include portable offices and change houses, mechanical workshops and stores, security, and on-site laboratory.

1.3.2 Ore Supply

New Horizon is a private mining company, owning an indicated copper ore resource of 3.8Mt in Phase 1. The predominate oxide copper minerals include: Malachite, Cuprite, Chrysocolla and Azurite. The intension is to beneficiate these copper oxide resources to produce blister copper of a high purity.

The Sub-surface ore is recovered from the ore body. The selected mining technique is top removal and box cutting by means of dosing and excavation. The ore processing plant is designed for 10,000 t/month Run-of-Mine (ROM) ore recovery. The ore recovered contains 1.35% Cu with a size distribution less than 300 mm. The ROM low grade ore is loaded by means of a Frontend Loader (FEL) and the low-grade ore is stockpiled. The ore splitting ratio is 10%, resulting in 9000 t/month low grade ore to the low-grade stockpile. The 1000 t/month ore for smelting purposes by the cupola smelter. Crushing and Screening of the mined ore for a product of -150mm and + 50mm to liberate the high-grade ore from the ROM product.

After crushing, the ore is screened to obtain the desired size range. Rocks between 50 and 120 mm is transferred to the Belt Picking Lines for further processing whilst rocks less than 50 mm will be sent for low grade stockpile leaching / future electrowinning plant. An estimated 9000 t/month is sent to stockpiling for future

leaching. The leach pile contains approximately 0.5% Cu. Ore containing 12-14% Cu is transferred from the picking lines to the Cu smelter

1.3.3 Production Estimates

Feed materials (copper oxide ore and metallurgical grade coke nuts) will be stockpiled on site to allow for a 1-month buffer capacity as follows:

- Screened and sorted lumpy ore from mine - 576 ton (10% Cu grade)
- Metallurgical coke nuts - 200 ton

The production capacity of the 1-ton shaft furnace will be 56 ton per month of copper blister ingots.

1.3.4 Design Parameters/Technical Specifications

The plant is designed for non-electric smelting of copper oxide ore and is a low-cost alternative to smelting copper in an arc furnace. The raw materials are sized prior to deliver to site. Copper oxide ore and metallurgical grade coke nuts are stockpiled to provide a buffer between raw material deliveries and the continuous process. First, the coke nuts are batched and charged into the Shaft to form a coke bed. The coke nuts and copper oxide ore are then batched to the correct predetermined recipe and sequentially layered into the Shaft furnace. Heat to melt the ore is generated by blowing preheated blast air through the bed at the coke bed level. Slag is tapped continuously, and the blister copper (matte) is tapped in batches to fill the ingots. The off gas produced during the process in treated and cleaned before released into the atmosphere. The off gas will pass through a slip gap, acting as a secondary combustion chamber to combust CO gas to CO_2 gas. This hot air will pass through a heat exchanger to the cyclone, to recover energy, where the matter/dust will be removed from the off gas before passing to the stack.

1.3.5 Air Emission Control- includes Emission data, Emission Monitoring

A high efficiency cyclone is used for dedusting of the off gas. The unit is capable of dedusting to ensure a particulate emission of less than 50mg/Nm^3 of particulate matter.

2. REGULATORY FRAMEWORKS

Air quality guidelines and standards are fundamental to effective air quality management, providing the link between the source of atmospheric emissions and the recipient of that air at the downstream receptor site. The ambient air quality guideline values indicate safe daily exposure levels for most of the population throughout an individual's lifetime. Air quality guidelines and standards are normally given for specific averaging periods. These averaging periods refer to the timespan over which the air concentration of the pollutant was monitored at a location.

Generally, three averaging periods are applicable in terms of ambient air quality standards, namely a 1-hour average, 24-hour average, and Annual average. The application of these standards varies, with some countries allowing a certain number of exceedances of each of the standards per year.

2.1 Namibia Legislation

In general, Namibia has adopted the South African Air Pollution Legislation for air quality control in the form of the Atmospheric Pollution Prevention Act (Act No 45 of 1965) (APPA). Therefore, the National Ambient Air Quality Standards notified by South Africa under National Environmental Management: Air Quality Act 2004 (Act no. 39 of 2006) dated December 24, 2009 and June 29, 2012 were applied in this study. The ambient air quality standards are set at levels, which are determined by the threshold of observable health effects on humans.

The Ambient Air Quality Standards for the concerned air pollutants from proposed plant are summarized in Table 2-1.

Table 2-1: National Ambient Air Quality Standards

Pollutant	Averaging Period	Concentration	Frequency of Exceedance
Sulphur Dioxide (SO_2)	1 Hour	350 µg/m³	88
	24 Hours	125 µg/m³	4
	1 Year	50 µg/m³	0
Nitrogen Dioxide (NO_X)	1 Hour	200 µg/m³	88
	1 Year	50 µg/m³	0
	24 Hours	75 µg/m³	4

Pollutant	Averaging Period	Concentration	Frequency of Exceedance
Particulate Matter (PM_{10})	1 Year	40 µg/m³	0
Particulate Matter ($PM_{2.5}$)	24 Hours	40 µg/m³	4
	1 Year	20 µg/m³	0

Source: National Environmental Management: Air Quality Act 2004 (Act no. 39 of 2006) dated December 24, 2009 and June 29, 2012, South Africa

3. EMISSIONS INVENTORY FOR THE PROPOSED COPPER SMELTER

An emissions inventory comprises the identification and quantification of sources of emissions. An emissions inventory forms the basis for assessing the impact of pollutants from operations on the receiving environment. The nature and significance of air quality impacts associated with proposed activities at Witvlei Copper Smelter Plant forms the focus of the current section. The approach typically followed includes:

- Identification of sources of emissions
- Identification of types of pollutants being released
- Determination of pertinent source parameters and
- Quantification of each source's emissions.

The main source of emissions due to the proposed smelter consists of:

- Emission from the smelter plant stack
- Materials handling.

Meanwhile, based on the project implementation, the overall emission inventory of air pollutant may be divided into phases – a) Construction and b) Operation.

3.1 Construction Phase

The construction phase will comprise land clearing and site development operations. To determine the significance of the potential for impacts it is necessary to quantify atmospheric emissions and predicted airborne pollutant concentrations and dust fall rates occurring because of such emissions. The construction phase will comprise a series of different operations including land clearing, material loading and hauling, stockpiling, grading, bulldozing, compaction, (etc.).

Meanwhile, the proposed site of Witvlei Copper Smelter Plant is flat and no major civil construction activities is envisaged on site. The main working fabrication of MS structure and the entire commissioning is supposed to be completed within a few months. Therefore, no significant emission is anticipated during the construction phase and the impact assessment is bypassed for this stage.

3.2 Operational Phase

During the operation phase of Witvlei Copper Smelter Plant, air emissions will be generated from the processes including charging, melting, refining, tapping, and dumping slag. These processes produce participate matter and gaseous emissions.

The emissions released from smelter include Particulate Matter (PM), Carbon Dioxide (CO_2), Nitrogen Oxide (NO_x), Sulphur Dioxide (SO_2) and numerous trace metals.

The detailed parameters of stack and emissions from the smelter plant for dispersion modelling purposes were provided by the Client (Table 3-1 and 302). Emissions were provided for Controlled and Uncontrolled operations. One stack height was assessed in the impact assessment viz. 14m. For dispersion modelling purposes, the highest value was selected from the range of emissions provided to assess the worst-case impacts.

Table 3-1: Parameters of Smelter Stack

Location	Stack Height, m	Stack Diameter, m	Flue Gas Temperature, °C	Volumetric Flow, Nm^3/Hr	Exit Velocity, m/s
241824.00 m E, 7520906.00 m S	14	0.3	150	3,832.45	23.32

Table 3-2: Controlled and Uncontrolled Emissions from Smelter Plant

Operational Conditions	Pollutant	Emission Rate, g/s	Concentration, mg/Nm^3
Controlled	PM_{10}	0.0284	22.76
	$PM_{2.5}$	0.0243	26.72
	SO_2	0.1959	184.00
	NO_x	0.2874	27.00
	CO_2	0.2330	218.83
Un-Controlled	PM_{10}	1.8931	1,781.25
	$PM_{2.5}$	1.6186	1,517.37
	SO_2	0.1959	184.00
	NO_x	0.2874	27.00
	CO_2	0.2330	218.83

In Table 3-2, under un-controlled emission scenario, the change in emission rate reflects in terms of particulate matter only, because of the high efficiency cyclone (para 1.3.5). No other control measure has been proposed at this stage.

4. AIR QUALITY IMPACT ASSESSMENT - DISPERSION MODELLING

Air dispersion modelling is mathematical simulation of the movement, dispersion, and transformation of pollutants in the atmosphere. It is a means of estimating downwind concentration of air pollution by using given data about the pollutant sources and the nature of surrounding atmosphere. Air dispersion models are computer programs based on mathematical equations established by US EPA and other environmental authorities that calculate the pollutant dispersion using the following parameters:

- Contaminant emission rate
- Characteristics of the emission source
- Local topography
- In-depth raw data of the Meteorology of the area
- Ambient emissions
- Information of surrounding civil structures for downwash calculations

Air dispersion models can estimate downwind concentrations of pollutants over varying averaging periods either short term (one-hour/24-hr) or long term (annual). These estimates are valuable for assessing the impacts of emissions from new activities or estimate likely changes resulting from process modifications.

The objectives of this air dispersion modelling are:

a) To predict the maximum Ground-Level Concentrations (GLC) of Particulate Matter (PM), SO_2, NO_x and Carbon Dioxide (CO_2) emitted from the smelter.
b) Compare the results with the ambient air quality standards adopted by the Namibian Environmental Authorities.
c) Determine the location of air pollution hotspots.

4.1 Selection of Dispersion Model

The gaussian based US EPA air dispersion model i.e., AERMOD has been selected method for Air Dispersion Modelling of this project. AERMOD can predict more realistic results and more accurate concentration values in this scenario. The dispersion results generated by AERMOD would prove to be closer to the actual concentration values after the smelter starts its operations in future.

4.2 Limitations of Dispersion Models

Like any other scientific procedure, there are off course limitations on the accuracy of the results. Although using capable air dispersion models and following the

guidelines and best practices set by EPA reduce the level of uncertainty to a great extent, but even the most sophisticated atmospheric dispersion models cannot predict the precise location, magnitude, and timing of ground-level concentrations with 100% accuracy.

Errors are introduced into results by the inherent uncertainty associated with the physics and formulation used to model dispersion, and by imprecise input parameters, such as emission and meteorological data. The most significant factors that determine the quality and accuracy of the results are:

- The suitability of the model for the task
- The availability of accurate source information
- The availability of accurate meteorological data
- The availability of accurate background concentration data

4.3 Site Description

This section describes, in detail, the meteorological and geological conditions of the project site and its surrounding environment that determine the dispersion behaviour of the emissions from stacks at the smelter plant.

4.3.1 Terrain

The project site is situated at (22°23'54.72"S, 18°29'32.29"E) in Witvlei, which is in the Omaheke region of central-eastern Namibia. It is situated on the B6 150 kilometres from Windhoek on the way to Gobabis.

The contour of the study area over a map of 10 x 10 km^2 grid shown in Figure 4.1. As it is clear from the image that the terrain is mostly flat within the boundary of the modelling domain, and elevation is approx. 1466 m above mean sea level.

However, travelling towards the north direction there is a gradual increase in altitude reaching as high as 1520 meters above mean sea level whereas towards south altitude decreases as low as 1430 meter. There is elevated terrain between proposed smelter site and Witvlei village which acts as natural barrier within the proposed smelter plant and Witvlei village located in the south.

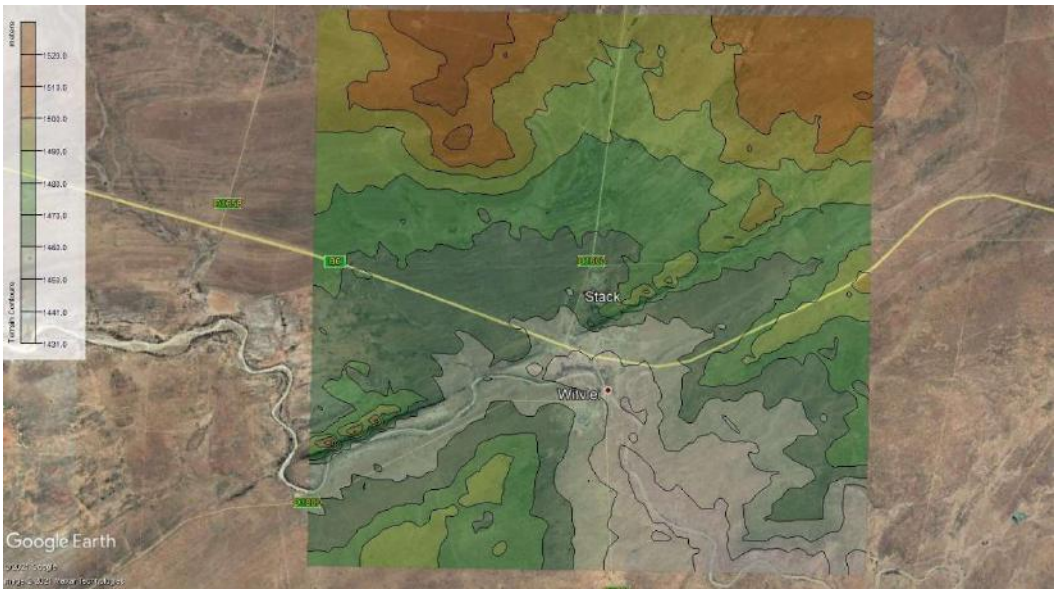


Figure 4-1: Terrain Contour Map

The contour map shown above portray the range of terrain heights in the region by the transition of fill colour from green to red as shown in the scale.

4.3.2 Terrain type

According to the AERMOD guidelines, terrain divided into three categories, simple elevated and complex.

- When the terrain height does not rise above the base elevation of the source(s), it is termed as simple terrain.
- When the terrain height rises above the base elevation of the source(s) but it remains below the total height of the stack, it is termed as elevated terrain.
- When the terrain height rises above the total height of the stack, it is termed as complex terrain.

The elevation contours of the site shown in Figure 4-1 clearly display that the surrounding area is elevated above the stack height, therefore, the terrain selection option is set to be complex terrain in the modelling software.

4.4 Air Pollution Meteorology

The meteorology governs the dispersion, transformation, and eventual removal of pollutants from the atmosphere (Pasquill and Smith, 1983; Godish, 1990). The extent to which pollution will accumulate or disperse in the atmosphere is dependent on the degree of thermal and mechanical turbulence within the earth's boundary layer. Dispersion comprises vertical and horizontal components of

motion established through the convective current and standards deviations ($\sigma\theta$) in wind direction.

The vertical component is defined by the stability of the atmosphere and the depth of the surface mixing layer. The horizontal dispersion of pollution in the boundary layer is primarily a function of the wind field. The wind speed determines both the distance of downwind transport and the rate of dilution because of plume 'stretching'. The generation of mechanical turbulence is similarly a function of the wind speed, in combination with the surface roughness. The wind direction, and the variability in wind direction, determine the general path pollutants will follow, and the extent of crosswind spreading (Shaw and Munn, 1971; Pasquill and Smith, 1983; Oke, 1990).

Pollution concentration levels therefore fluctuate in response to changes in atmospheric stability, to concurrent variations in the mixing depth, and to shifts in the wind field. Spatial variations, and diurnal and seasonal changes, in the wind field and stability regime are functions of atmospheric processes operating at various temporal and spatial scales (Goldreich and Tyson, 1988). Therefore, the atmospheric processes at micro, macro and meso scales need to be considered to accurately parameterise the atmospheric dispersion potential of a particular area.

The analysis of meteorological data observed for the site provides the basis for the parameterisation of the ventilation potential of the site, and to provide the input requirements for the dispersion simulations. Parameters that need to be considered in the characterisation of ventilation potentials include wind speed, wind direction, extent of atmospheric turbulence, ambient air temperature and mixing depth.

A comprehensive data set for at least three year of detailed hourly average wind speed, wind direction and temperature data are needed for the dispersion simulations. In this present study meteorological data for the year January 2018 to December 2020 was obtained for the site.

The vertical dispersion of pollution is largely a function of the wind field. The wind speed determines both the distance of downward transport and the rate of dilution of pollutants. The generation of mechanical turbulence is similarly a function of the wind speed, in combination with the surface roughness.

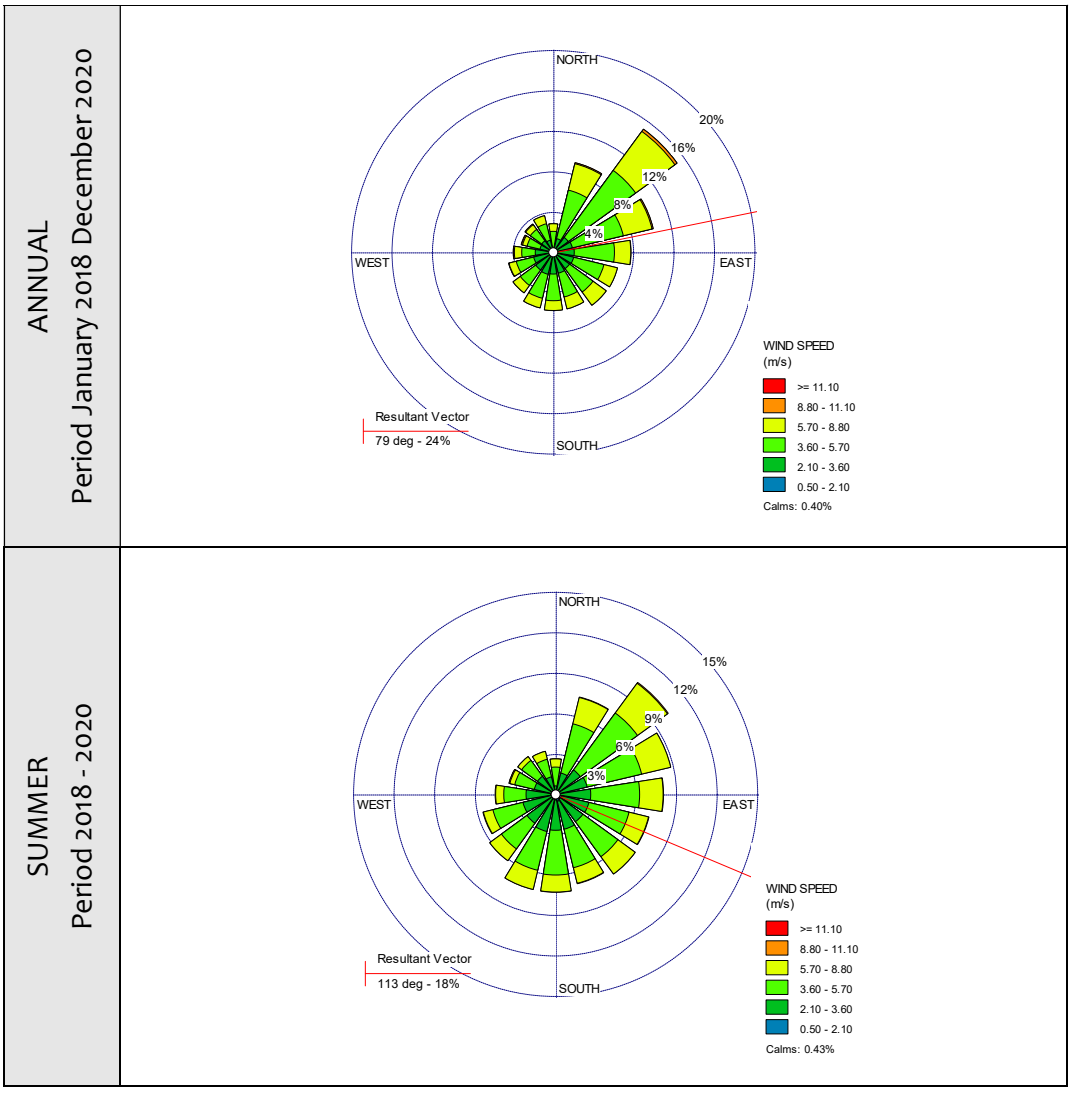
4.4.1 Wind Rose (Wind Speed and Direction)

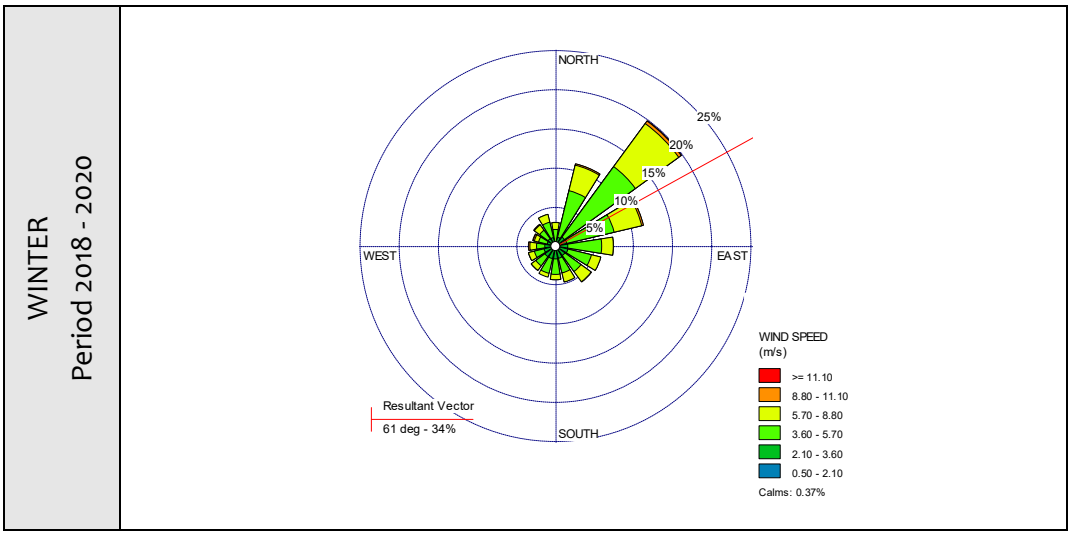
A wind rose gives a very concise but information-laden view of how wind speed and direction are typically distributed at a particular location. Presented in a circular format, the wind rose shows the frequency of winds blowing FROM the specific

directions. The length of each "spoke" around the circle is related to the frequency of time that the wind blows from a particular direction. Each concentric circle represents a different frequency, emanating from zero at the center to increasing frequencies at the outer circles. The wind roses show contain additional information, in that each spoke is broken down into discrete frequency categories that show the percentage of time that winds blow from a particular direction and at certain speed ranges. All wind roses shown in this report uses 16 cardinal directions, such as north (N), NNE, NE, etc.

The wind rose plots from the project site are shown below. These plots are prepared on a standard 16-point compass to show the wind speed and direction from which the wind blows during the year, seasons (Figure 4-2), and each month (Figure 4-3) of the year 2018-2020. Each wind rose plot also displays the resultant vector to indicate prevalent speed and direction of wind during that specific period.

Figure 4-2: Annual and Seasonal Wind Roses

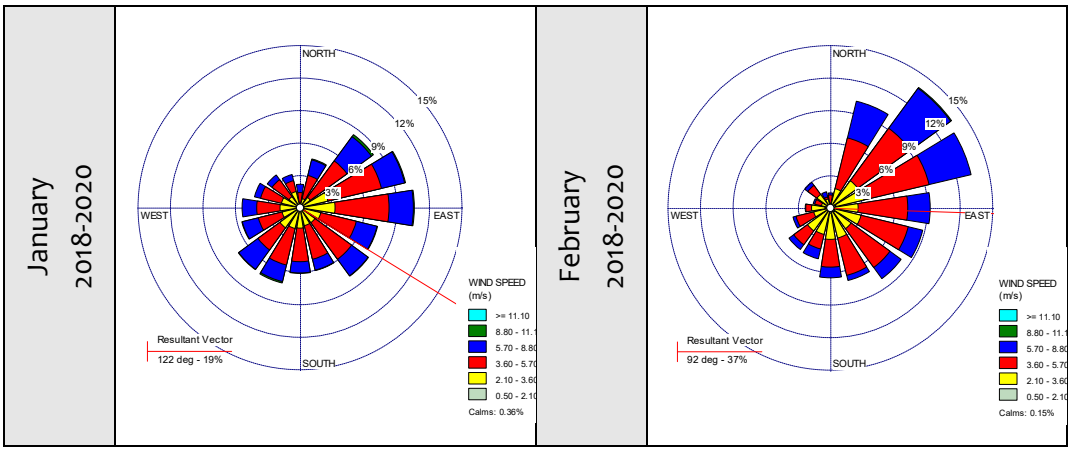




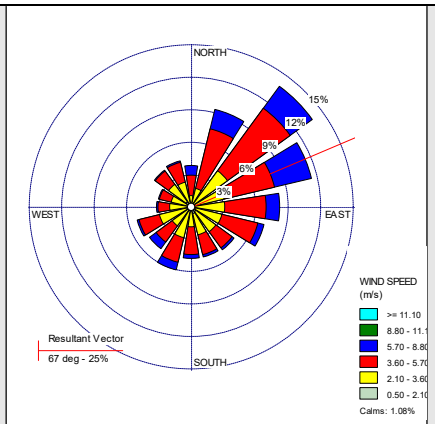
The prevailing wind direction based on the resultant vector of annual wind rose at Witvlei for the three-year period is from the ENE (34% of the time) and average wind speed were 4.38m/s. The seasonal wind roses indicate the predominate wind direction from SSE (18%) and NNE (34%) during Summer and Winter respectively. The average wind speed during Summer and Winter were 4.12m/s and 4.62m/s respectively.

Further, seasonal average wind roses reflected distinct shifts in the wind field between the summer and winter. During the summer winds are coming from all directions attributed towards better dispersion (in all direction) whereas, in the winter months, wind is predominately blowing from NE which, may limit the dispersion in SW direction and cause elevated ground level concentration of pollutant.

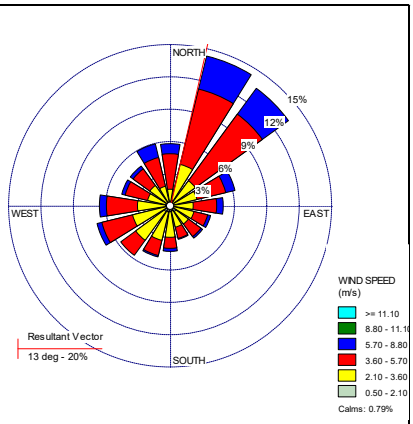
Figure 4-3: Monthly Wind Roses



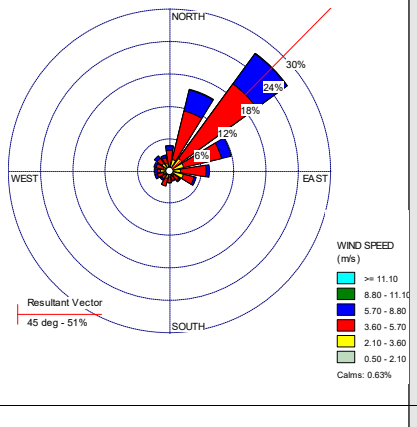
March 2018-2020



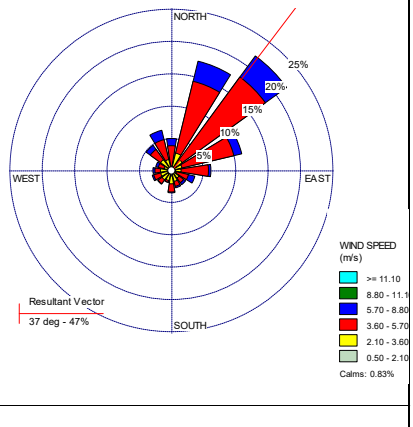
April 2018-2020



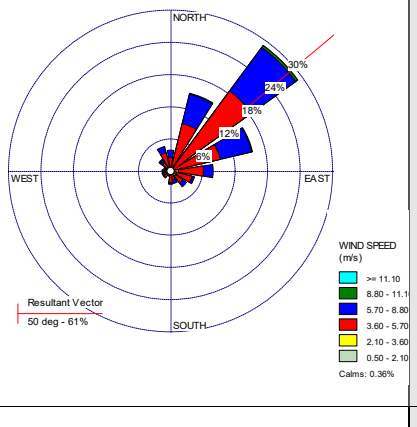
May 2018-2020



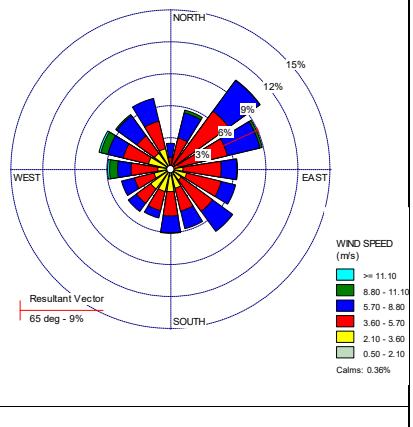
June 2018-2020



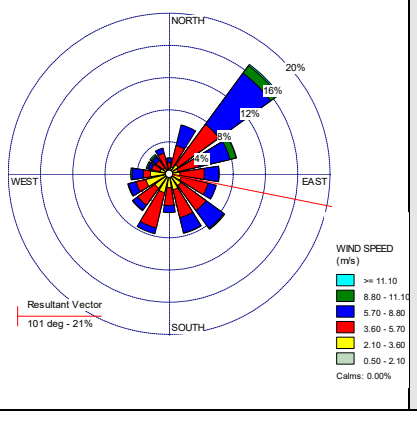
July 2018-2020



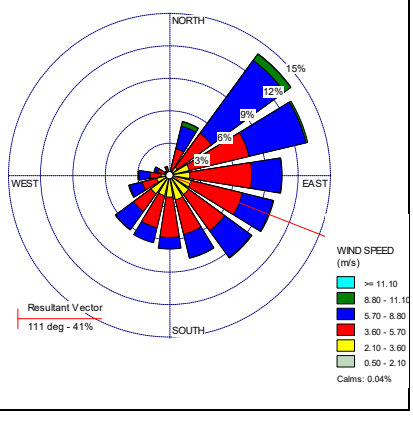
August 2018-2020

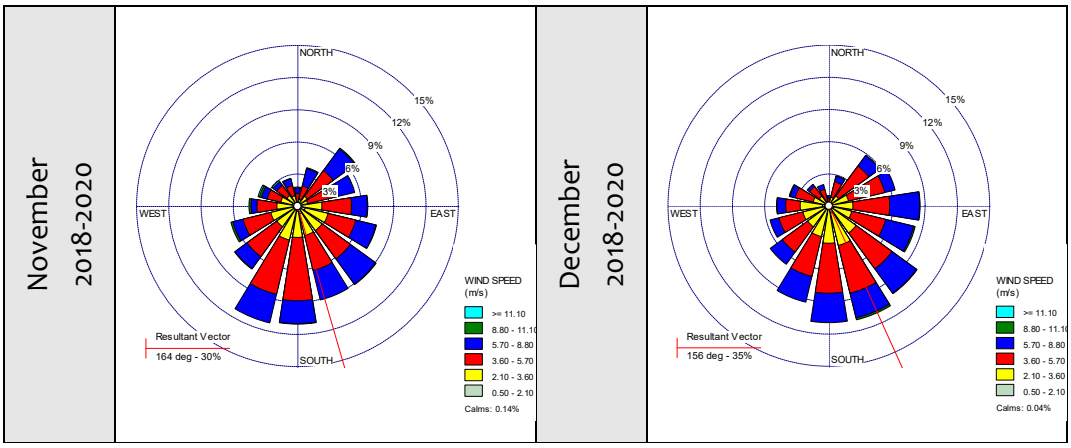


September 2018-2020



October 2018-2020





The summary of month wise Wind rose plots presented in Figure 4-3 above is presented in Table 4-1. This shows that wind blows mostly from East ± North/South Sector throughout the year. The months of January and August display the mixed pattern depicting the transition in the direction of wind patterns of summer and winter months. The calm wind remained ≤ 1% throughout the year indicates better transportation of pollutant in the study area.

Table 4-1: Summary of Monthly Wind Rose

Months	Average Wind Speed, m/s	Calm, %	Vector, deg.	Occurrence, %
January	4.49	0.36	122	19
February	4.15	0.15	92	37
March	3.81	1.08	67	25
April	3.77	0.79	13	20
May	4.28	0.63	45	51
June	4.12	0.83	37	47
July	4.89	0.36	57	61
August	4.71	0.36	65	9
September	4.80	0.00	101	21
October	4.88	0.04	111	41
November	4.42	0.14	164	30
December	4.32	0.04	156	35

4.4.2 Albedo, Bowen ratio and Surface Roughness Parameters

AERMOD – US EPA's most advanced model, no longer uses the Pasquill stability classes to categorize atmospheric turbulence. Instead, it uses the parameters like Albedo, Bowen Ratio and Surface Roughness which yield far more accurate results for the modelling of a project. These three parameters vary for each type of land like Urban, Rural, Forest, Desert Shrubland and Coastal land. For this project, these values are shown in the Table 4-2.

Table 4-2: Surface Parameters

Parameter	Value (Summer)	Value (Winter)
Albedo	0.28	0.45
Bowen Ratio	4	6
Surface Roughness	0.3	0.15

4.5 Meteorological Data Preparation

AERMET is a meteorological data pre-processor for AERMOD, which were used to processes surface and upper air meteorological data and creates two files: a surface data file (sfc) and a profile data file (pfl). The hourly surface observation of meteorological data was obtained from nearby. The data was available as excel file. The following recorded meteorological parameters were considered for further processing:

- Wind Speed m/s at 10m
- Wind Direction at 10m
- Ambient Temperature, ℃
- Station Pressure, millibar
- Solar Radiation, Langley
- Relative Humidity, %

The meteorological data processing occurs in three distinct stages that are unrelated to the type of data being processed, each required to be run separately.

The first stage extracts the surface and upper air data from files in which the data are stored in specific archive formats. In this project, the required data were no available in the specific archive formats, thus the first step towards the AERMET run was to prepare available meteorological data into AERMET supported format.

4.5.1 Surface Data file

AERMET can extract surface hourly weather observations from several standard formats, but our data was available in non-standards format i.e., Excel File. Therefore, the data in excel sheet was converted into Solar And Meteorological Surface Observation Network (SAMSON) format.

While preparing data in SAMSON format, parameters like Ceiling Height was estimated from the existing parameters, to complete the requirements.

4.5.2 Upper Air Data file

AERMET can extract upper air sounding data from two formats including: TD-6201 and the former Forecast Systems Laboratory (FSL) format. Since, upper air data was not present, estimator was used to generate upper air data file from the surface observation.

4.5.3 Missing Data Treatment

Regulatory analyses for the short-term ambient air quality standards (1 to 24-hour averaging) involve the sequential application of a dispersion model to every hour in the analysis period (one to five years); such analyses require a meteorological record for every hour in the analysis period.

Substitution for missing or invalid data is used to meet this requirement. Since the missing surface data where less than 1% which is way less than the permissible regulatory modelling analyses limit which allow to substitute for up to 10 percent of the data.

In present case, data bases with isolated one-hour gaps were filled with estimates based on linear interpolation. In case if the gaps where more than one-hour, substitution procedures which are “best estimators”, “Persistence” is the use of data from the previous time (hour). This procedure was used for most meteorological variables to fill extended periods gaps.

4.5.4 Quality Assessment

The data quality assessments were carried out at two stages. In the first stage SCREENING were performed to confirm data within the THRESHOLD and within the possible rage of local conditions.

In stage two, the quality assessment performed through inbuild QA module of AERMET. Further, specific to sounding data, MODIFY keyword is used for Adjusting

sounding data. MODIFY keyword in AERMET has been designed to check for other problems with the upper air data and correct them if the MODIFY keyword is used. The MODIFY keyword directs AERMET to 'turn on' the process and perform some preliminary quality control as the data are extracted. This keyword does not have any parameters associated with it. By specifying this keyword, the following actions occur: - Some mandatory levels are deleted from the sounding; - A nonzero wind direction is set to 0 if the wind speed is 0; - Missing ambient and dew point temperatures are replaced by interpolated values.

The wind speed and wind direction at each level are checked to ensure that there are no levels with a zero-wind speed and a non-zero wind direction. If one is found, the wind direction is set to zero to represent calm conditions. However, it is important to note that the winds from the soundings are not used in any boundary layer parameter estimates.

Before, looking into the QA Audit summary of AERMET, please note that a few default quality control thresholds were modified to meet the site-specific requirements. Those changes are mentioned in the summary sections.

5. DISPERSION MODELLING SIMULATIONS

The AMS/EPA Regulatory Model (AERMOD) was specially designed to support the EPA's regulatory modelling programs. AERMOD is a regulatory steady-state plume modelling system with three separate components: AERMOD (AERMIC Dispersion Model), AERMAP (AERMOD Terrain Pre-processor), and AERMET (AERMOD Meteorological Pre-processor). The AERMOD model includes a wide range of options for modelling air quality impacts of pollution sources, making it a popular choice among the modelling community for a variety of applications. AERMOD contains basically the same options as the ISCST3 model.

AERMOD requires two types of meteorological data files, a file containing surface scalar parameters and a file containing vertical profiles. These two files are generated by the U.S. EPA AERMET meteorological pre-processor program.

5.1 Model Configuration

Detailed information about inputs and model setup is presented in the coming pages.

5.1.1 Building downwash

The effect of building downwash, due to the factory buildings, has been included in the model. The coordinates of factory building considered in the modelling is presented in Table 5-1 and Figure 5-1.

Table 5-1: Coordinates of Smelter Shade

Corner	Easting, m	Northing, m	Height, m
#1	241817.00	7520904.00	12
#2	241836.00	7520900.00	12
#3	241829.00	7520875.00	12
#4	241810.00	7520880.00	12

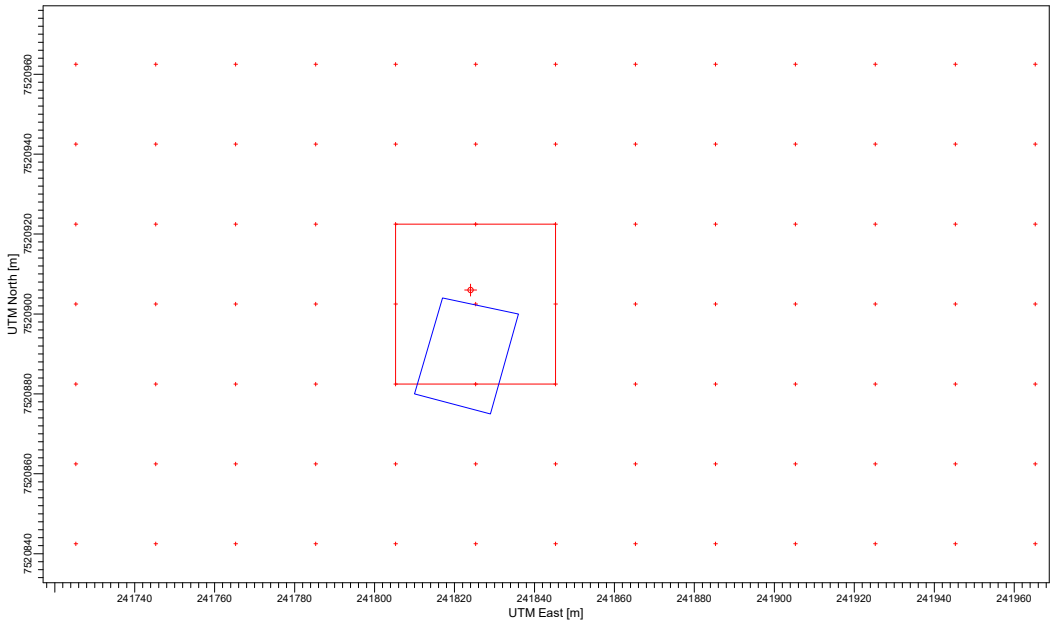


Figure 5-1: Layout of Factory Building and Emission Stacks

The smelter shade and stack were mapped into the models to create a three-dimensional visualisation of the site and its emission points as show in Figure B. Building can influence the passage of airflow over the emission stacks and draw plumes down towards the ground (termed building downwash). The stacks themselves can influence airflow in the same way as buildings by causing low pressure regions behind them (termed stack tip downwash). Both building and stack tip downwash were incorporated into the modelling.

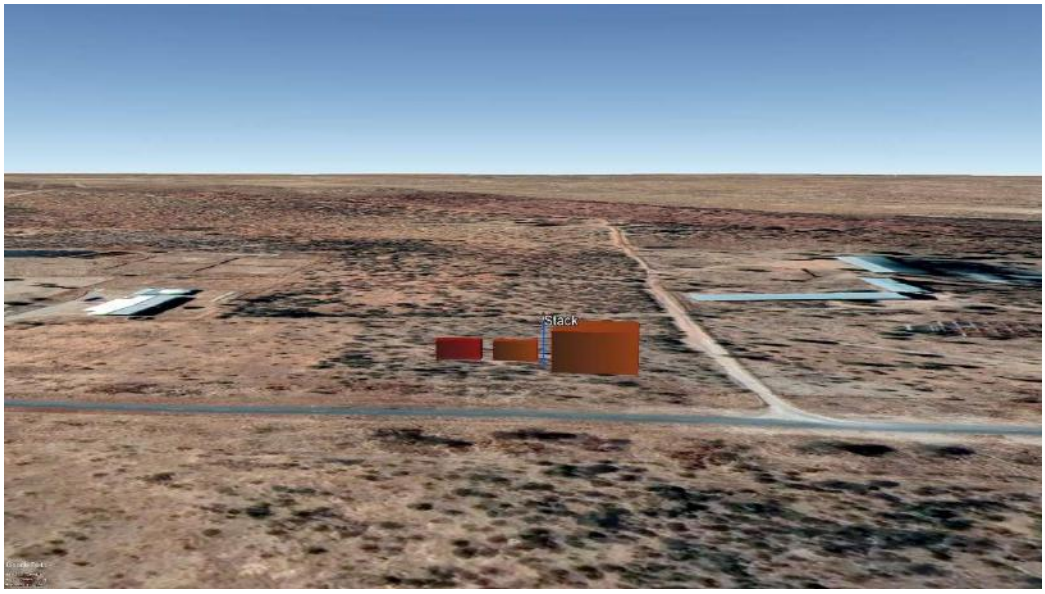


Figure 5-2: 3-dimensional Visualisation of the Building and Stack

Due to the proximity to factory building, the PRIME (Plume Rise Model Enhancements) building downwash algorithm has been incorporated into the model to determine the influence (wake effects) of these buildings on dispersion in each direction considered. The PRIME algorithm considers the position of the stack relative to the building in calculating building downwash. In the absence of the building, the plume from the stack will rise due to momentum and/or buoyancy forces. Wind streamlines act on the plume leads to the bending over of the plume as it disperses. However, due to the presence of the building, wind streamlines are disrupted leading to a lowering of the plume centreline.

5.1.2 Receptors and Spatial Resolutions

Specific sets of receptors spacing are required to assure that maximum impacts from sources are captured in the model. However, each receptor point requires computational time. Consequently, it is not optimal to specify a dense network of receptors over a large modelling area; the computational time would negatively impact productivity and available time for proper analysis of results. Therefore, a multi-tier grid approach that combines aspects of coarse grids and refined grids in a modelling application is recommended when specifying receptor locations. The multi-tier grid approach strives to achieve proper spatial definition of points of maximum impact while maintaining reasonable computation times without sacrificing sufficient resolution.

It is recommended to use Cartesian grid to define the receptor grids with the facility under consideration as close to the centre of the grids as possible. Whereas Polar grids are not recommended for regulatory air dispersion modelling. This is because polar receptor spacing from the facility under consideration becomes too large too quickly as the distance increases, making interpretation of results difficult.

The multi-tier Cartesian grid with pre-defined grid spacing as defined in Table 5-2 is adopted in the current modelling exercise. A total of 1932 gridded receptors were generated for assessing ambient air quality, with relatively five nested resolution near the proposed plant and coarse resolution away from the plant, as shown in Figure 5-3.

Table 5-2: Grid Spacing for Receptor Grid

Distance from Bounding Box, m	Receptor Spacing, m
200	20
500	50
1000	100
2000	200

Distance from Bounding Box, m	Receptor Spacing, m
>5000	500

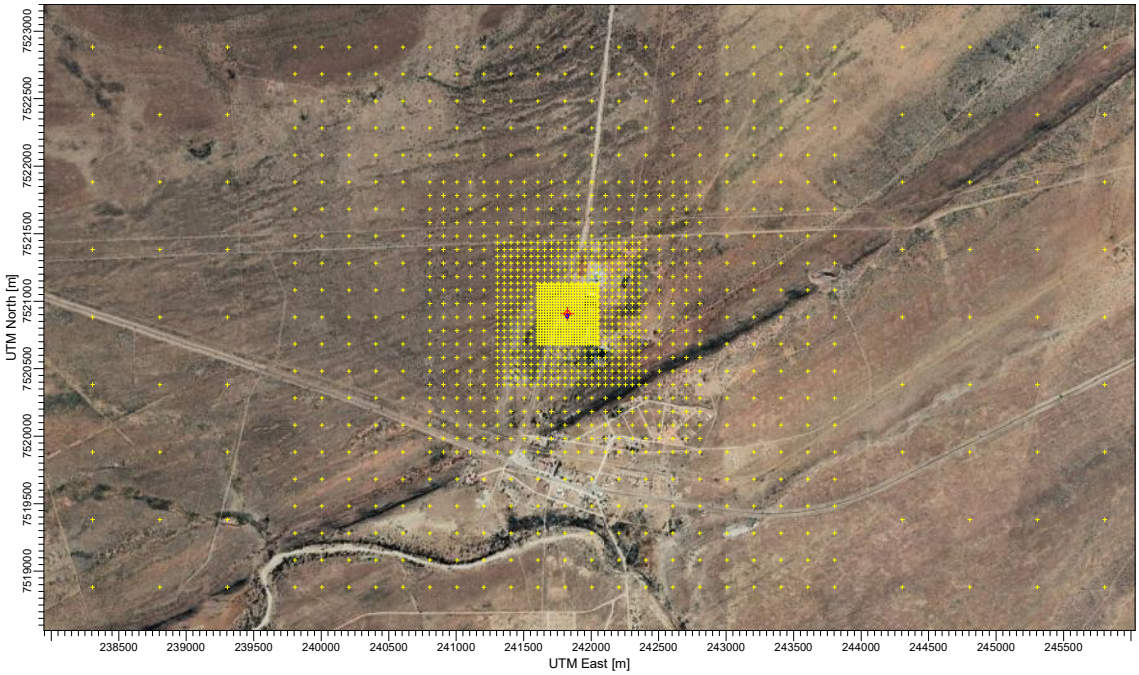


Figure 5-3: Gridded Receptor Network for AERMOD

Further, discrete receptors are defined in areas of concern as per the circumstances which include the presence of hotspots and sensitive receptors within the modelling domain, e.g., schools, residential zones, or hospitals (Table 5-3).

Table 5-3: Discrete Cartesian Receptors

Name	Easting, m	Northing, m	Elevation, m
Abattoir	242050.5	7521212	1465.03
Council	241111.5	7519698	1450.29
Charcoal Plant	242039.6	7520621	1462.01
Health Clinic	241652.9	7518461	1458.56
School	241626.9	7518184	1460.08
Primary School	241752.1	7518204	1458.20
Community Center	242031.4	7518342	1454.72
Soccer Field	242126.7	7518458	1454.11

6. MODEL RESULTS AND CONCLUSIONS

6.1 Dispersion Model Results (Study Area)

Results obtained by multiple executions by making different control settings explained in the previous chapter are presented ahead with brief commentary and conclusions in each case.

Simulations were undertaken to determine the impact of Particulate Matter (PM_{10} and $PM_{2.5}$), Sulphur Dioxide (SO_2) and Nitrogen Oxide (NO_x) from stack emissions of the proposed smelting activities. Due to the temporary nature of the construction phase, this was not simulated for the current study.

It should be noted that isopleth plots reflecting hourly/daily averaging periods contain only the highest predicted ground level concentrations for that averaging period, over the entire period for which simulations were undertaken. It is therefore possible that even though a high hourly/daily concentration is predicted to occur at certain locations, that this may only be true for one day during the entire period.

The following scenarios were assessed in the current study and the summary of the model run is presented in Table 6.1. The output isopleth is attached as Annexure 1.

- Scenario 1: Controlled Operation at the Smelter (for all pollutant)
- Scenario 2: Un-Control Operating conditions, failure of Cyclone (for Particulate Matter Only)

Table 6-1: Summary of Predicted Ground Level Concentration

Pollutant	Averaging Period	Ambient AQ Standards µg/m³	Maximum Predicted Concentration µg/m³	
			Controlled	Uncontrolled
PM_{10}	24-Hour	75	8.38	558.74
	Annual	40	2.52	167.72
$PM_{2.5}$	24-Hour	20	7.17	477.73
	Annual	40	2.15	143.39
SO_2	1-Hour	350	88.97	-
	24-Hour	125	57.82	-
	Annual	50	17.36	-
NO_x	1-Hour	200	130.52	-
	Annual	40	25.46	-

Note: Only particulate matters (PM) were modelled for controlled and uncontrol scenario because, the emission control device (cyclone) is proposed only for PM.

As summarised in Table 6.1, in case of all pollutant modelled the predicted concentrations were below the Ambient Air Quality Standards. However, it is important to note that this is impact assessed from the proposed smelter plant only, the actual impact would be known once the predicted value is added to the background concentration of respective pollutants.

6.2 Dispersion Model Results (Sensitive Receptors)

The ground level concentration of criteria pollutants at discrete receptors were also predicted and the summary of the results are presented in Table 6-2 and 6-3. The predicted GLC at the sensitive receptors around the plant indicates insignificant impacts because of the emissions from the proposed smelter plant. Relatively, Abattoir in the north and Charcoal Processing plant in the south are receiving some impact otherwise the Witvlei village remains unaffected most of the time.

Table 6-2: 24-Hourly Average Concentration Over 3 Years Sensitive Receptor Points

Location Name	X-Coordinate, m	Y-Coordinate, m	Predicted Concentration, µg/m³			
			PM_{10}	$PM_{2.5}$	SO_2	NO_x
Abattoir	242050.5	7521212	0.54	0.46	3.74	-
Head Office: Witvlei Village Council	241111.5	7519698	0.12	0.10	0.82	-
Charcoal Processing Plant	242039.6	7520621	0.72	0.62	5.00	-
Health Clinic	241652.9	7518461	0.03	0.03	0.21	-
School	241626.9	7518184	0.03	0.02	0.17	-
Primary School	241752.1	7518204	0.02	0.02	0.12	-
Community Hall	242031.4	7518342	0.03	0.03	0.23	-
Soccer Field	242126.7	7518458	0.04	0.03	0.26	-

Note: Since there are no ambient air quality standards of NOx for 24-hour average, the model was not run for this averaging time.

Table 6-3: Annual Average Concentration Over 3 Years at Sensitive Receptor Points

Location Name	X-Coordinate, m	Y-Coordinate, m	Predicted Concentration, µg/m³			
			PM_{10}	$PM_{2.5}$	SO_2	NO_X
Abattoir	242050.5	7521212	0.05	0.05	0.36	0.53
Head Office: Witvlei Village Council	241111.5	7519698	0.01	0.00	0.08	0.11
Charcoal Processing Plant	242039.6	7520621	0.04	0.04	0.29	0.43
Health Clinic	241652.9	7518461	0.00	0.00	0.01	0.02
School	241626.9	7518184	0.00	0.00	0.01	0.01
Primary School	241752.1	7518204	0.00	0.00	0.01	0.02
Community Hall	242031.4	7518342	0.00	0.00	0.01	0.01
Soccer Field	242126.7	7518458	0.00	0.00	0.01	0.01

6.3 Conclusions

In general, the predicted impact of all modelled pollutants emitted from Witvlei Smelter Plant was below the Ambient Air Quality Standards. Meanwhile, to assess the actual impact it is required add the predicted value with background concentration of respective pollutants.

Further, it is observed that predicted GLS is very localised closed to the proposed plan due to restricted dispersion because of lower stack height results into dominance of building downwash.

The modelling scenario of uncontrolled emission of particulate matter demonstrate very concentration of particulate matter of the order of >500 µg/m³ and >400 µg/m³ in the case of PM_{10} and $PM_{2.5}$ respectively. The failure of dust control system (in this case cyclone) not only attribute to high ground level concentration but also the building downwash effect due to low stack height, restrict the impacts close to the plan as shown in Figure 6-1.

Figure 6-1: Impact zone due to failure of cyclone and building downwash

7. RECOMMENDATION

- The present modelling report is based on the calculated emission rates of pollutants; therefore, it is recommended to conduct stack emission monitoring once the proposed smelter plant is commissioned and stablished to establish the actual emission rates of the pollutants of the interest.
- Establish and carryout ambient air quality monitoring stations at the selected locations before and after the proposed smelter become operational. This exercise is recommended to establish the background level (existing) of ambient air quality before the commissioning of the plant and assess the impact after the commissioning of the plant.
- It is recommended to carryout ambient air quality monitoring at minimum four locations i.e. "Abattoir", "Plant Site", "Head Office of Witvlei Village Council" and "Health Clinic".
- Once, actual stack monitoring and ambient air quality results are available, the air dispersion modelling study may be repeated to validate the predictions.

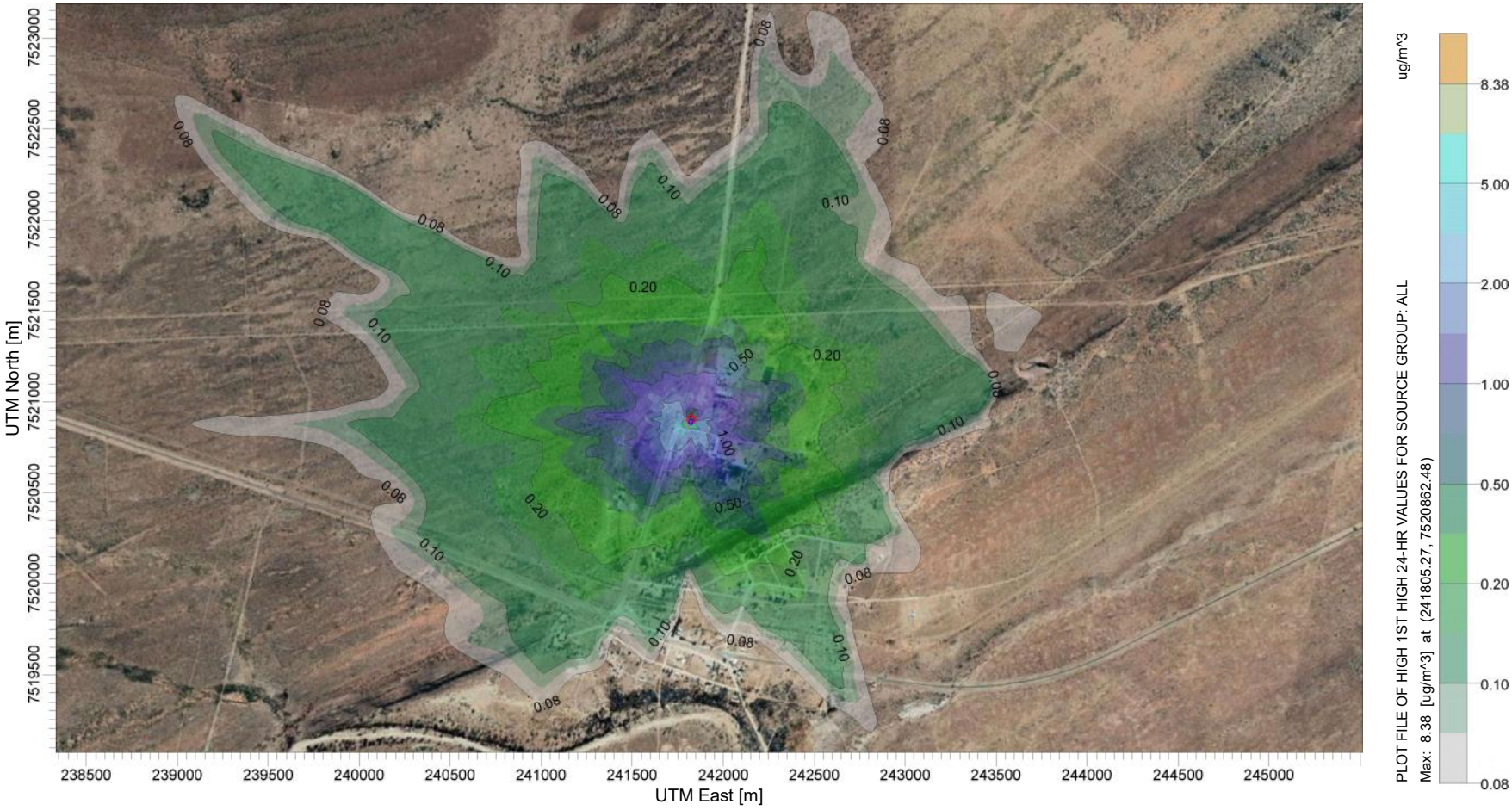


Figure 7-1: The Maximum Predicted 24-Hourly Average Concentrations of PM_{10} (Controlled)

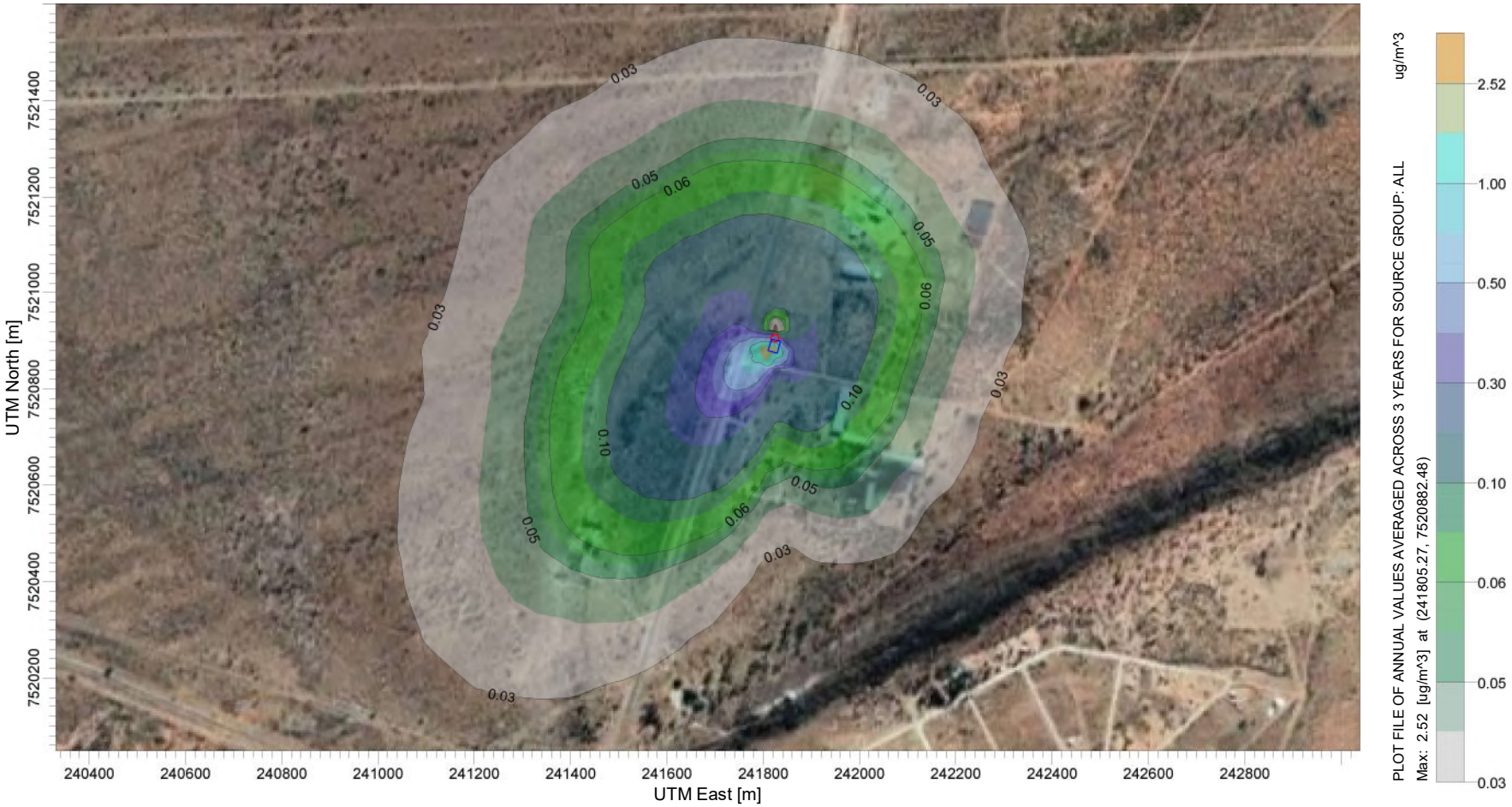


Figure 7-2: The Maximum Predicted Annual Average Concentrations of PM_{10} (Controlled)

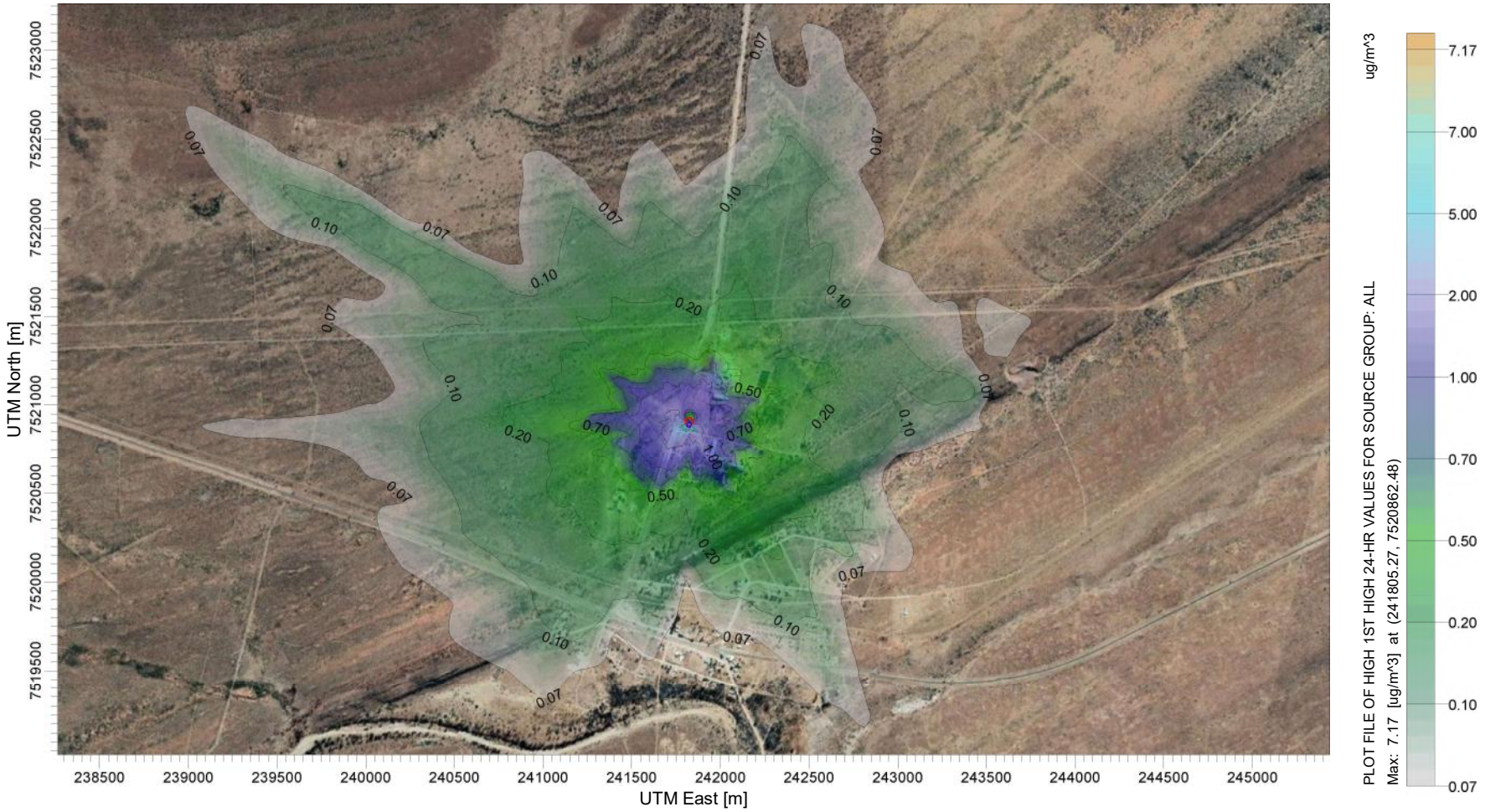


Figure 7-3: The Maximum Predicted 24-Hourly Average Concentrations of $PM_{2.5}$ (Controlled)

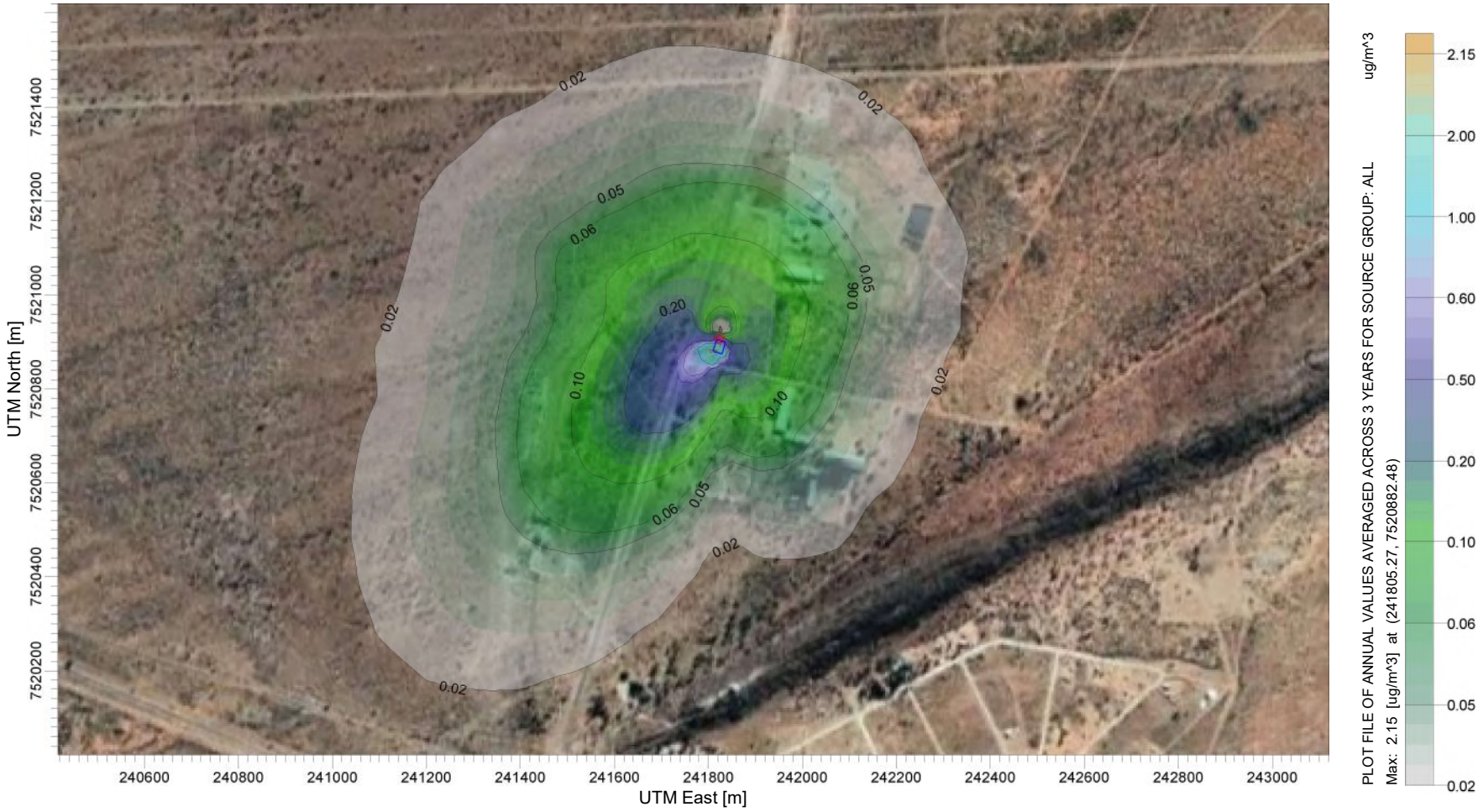


Figure 7-4: The Maximum Predicted Annual Average Concentrations of $PM_{2.5}$ (Controlled)

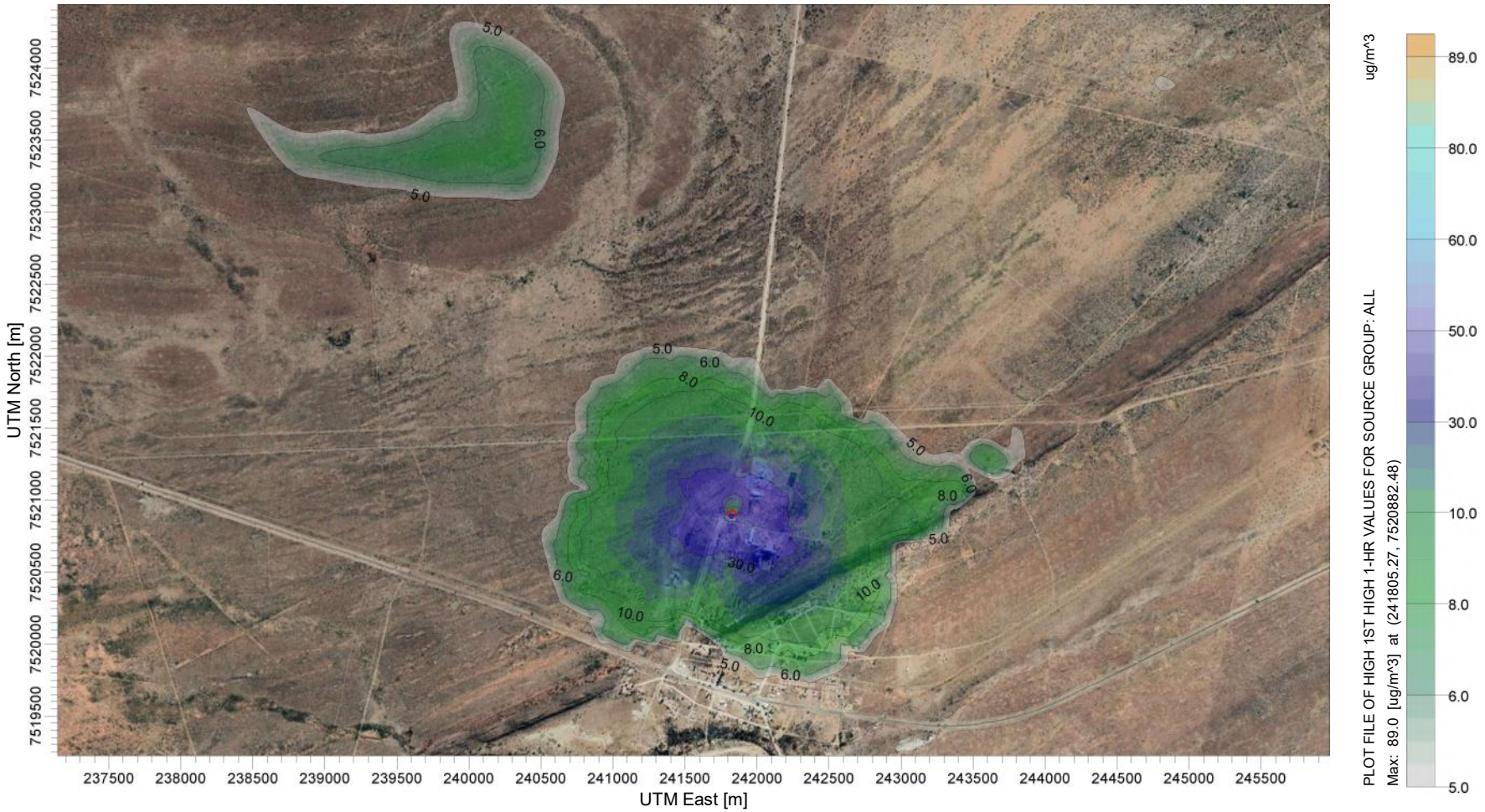


Figure 7-5: The Maximum Predicted 1-Hourly Average Concentrations of SO2

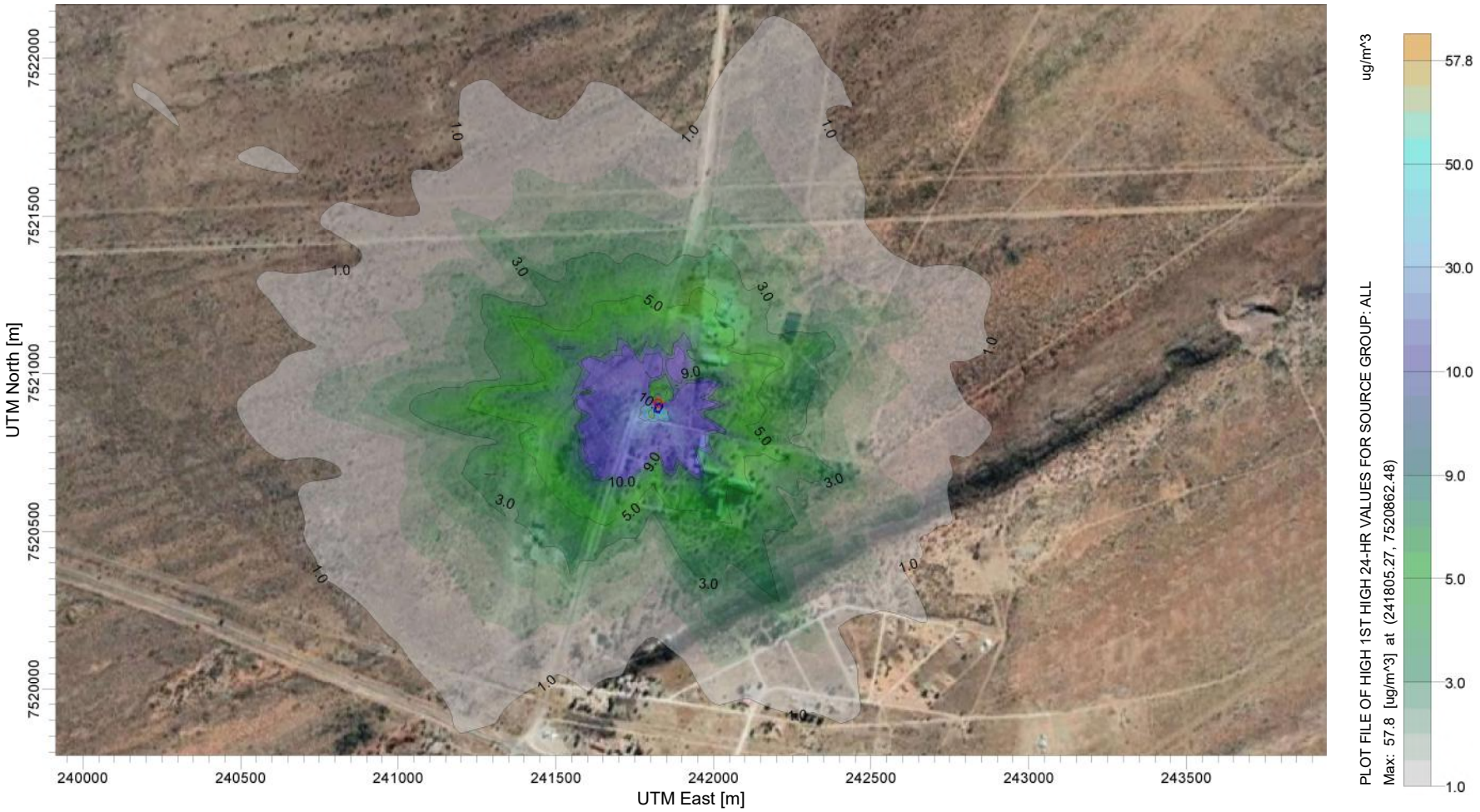


Figure 7-6: The Maximum Predicted 24-Hourly Average Concentrations of SO_2

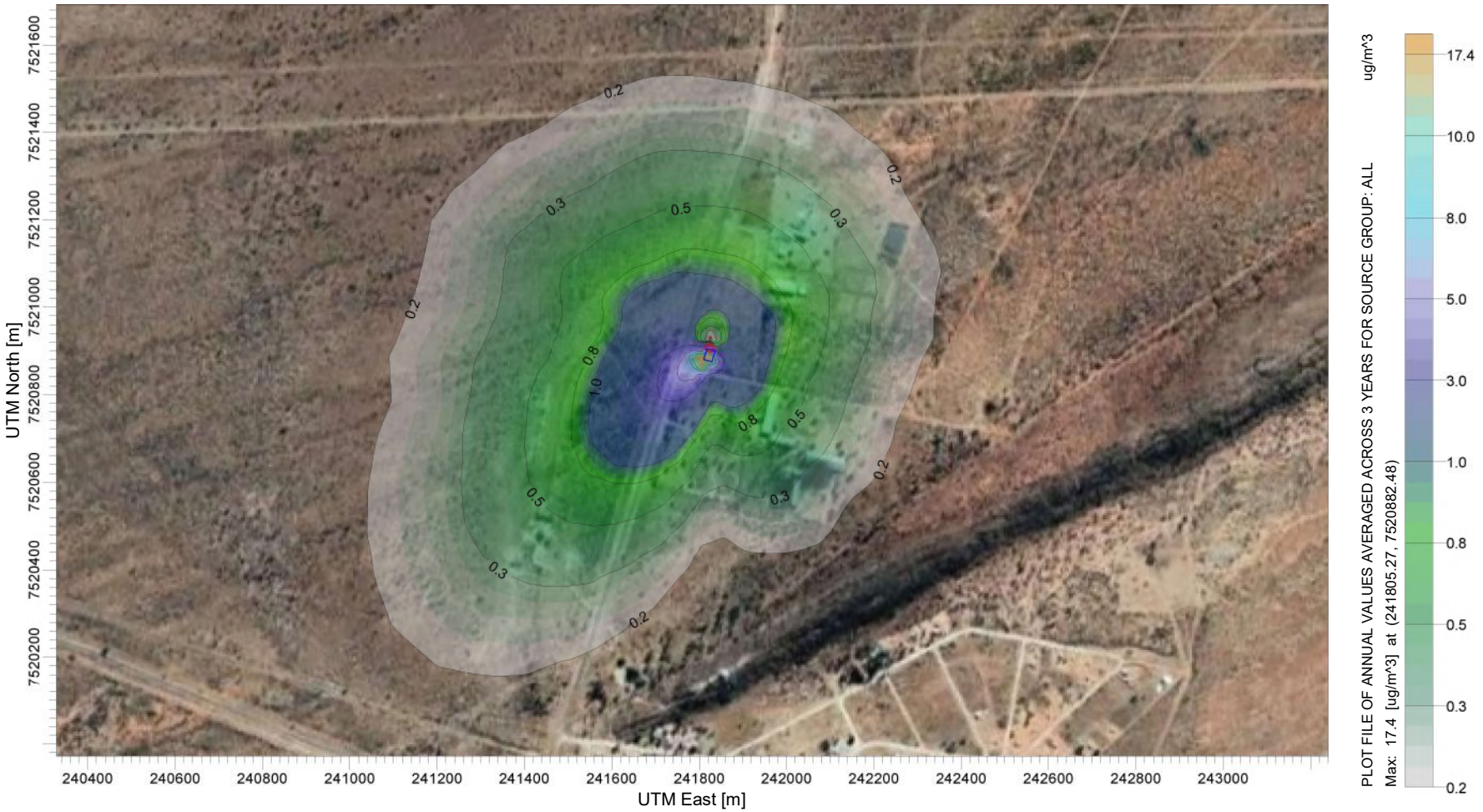


Figure 7-7: The Maximum Predicted Annual Average Concentrations of SO_2

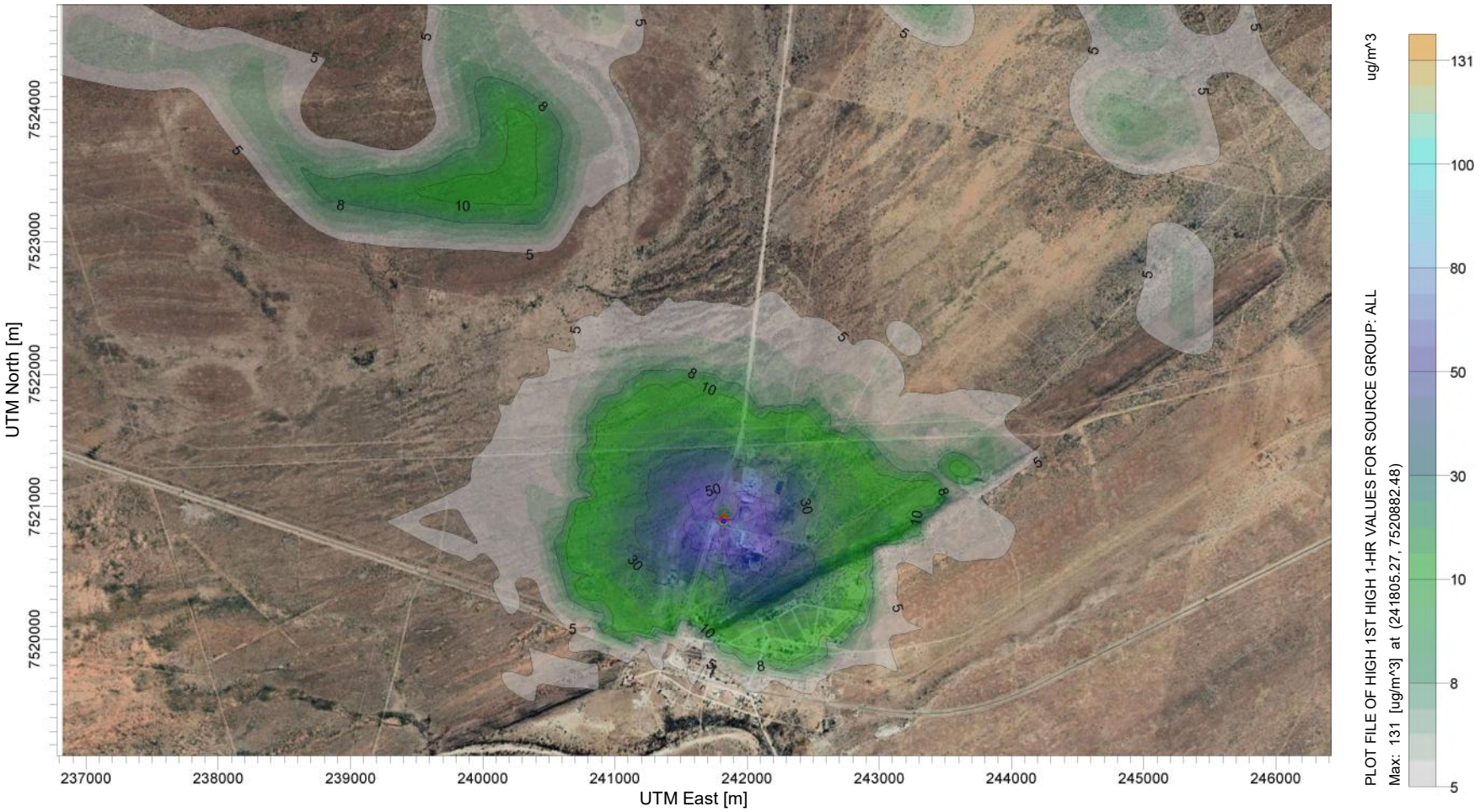


Figure 7-8: The Maximum Predicted 1-Hourly Average Concentrations of NO_X

Figure 7-9: The Maximum Predicted Annual Average Concentrations of NO_X

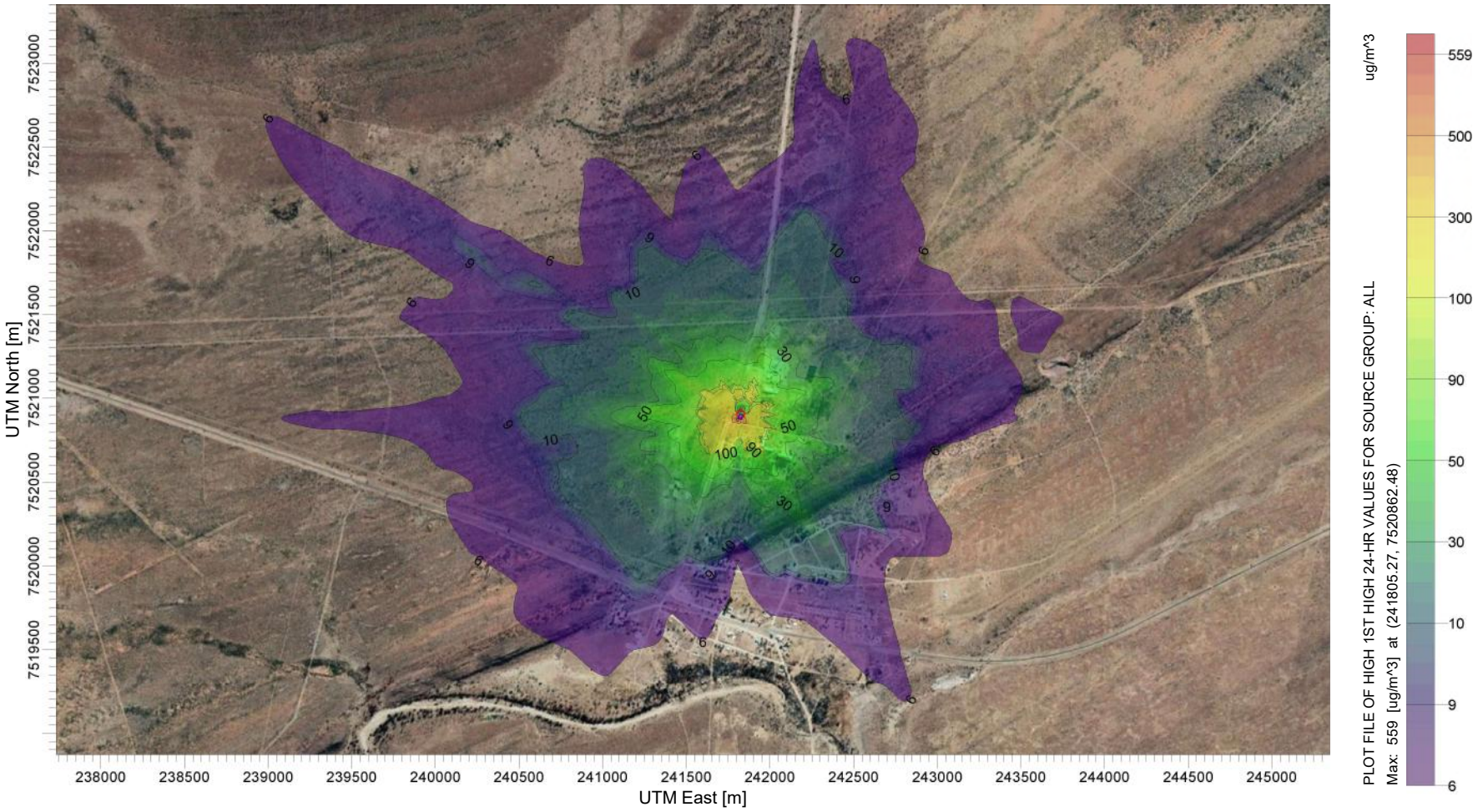


Figure 7-10: The Maximum Predicted 24-Hourly Average Concentrations of PM_{10} (Uncontrolled)

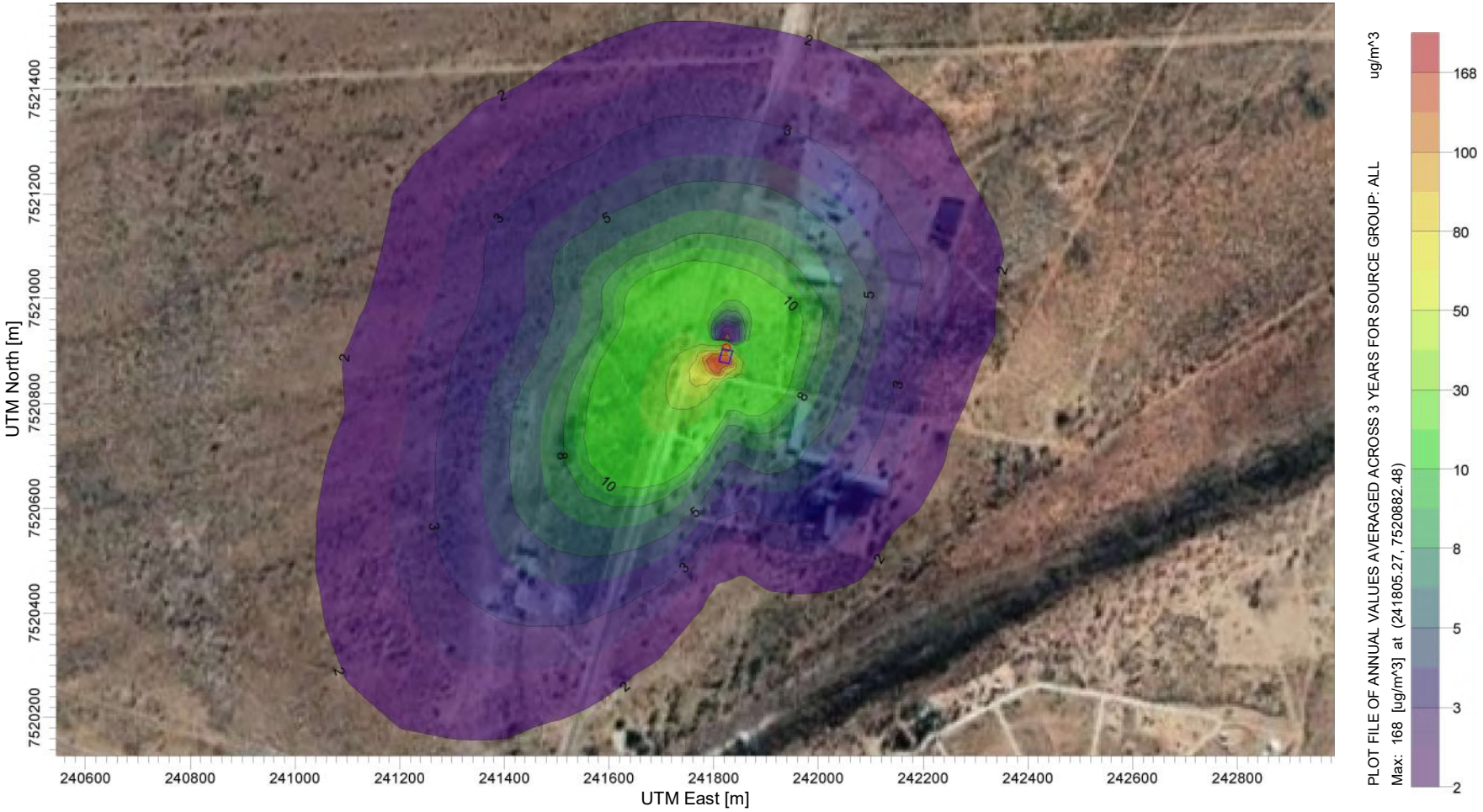


Figure 7-11: The Maximum Predicted Annual Average Concentrations of PM_{10} (Uncontrolled)

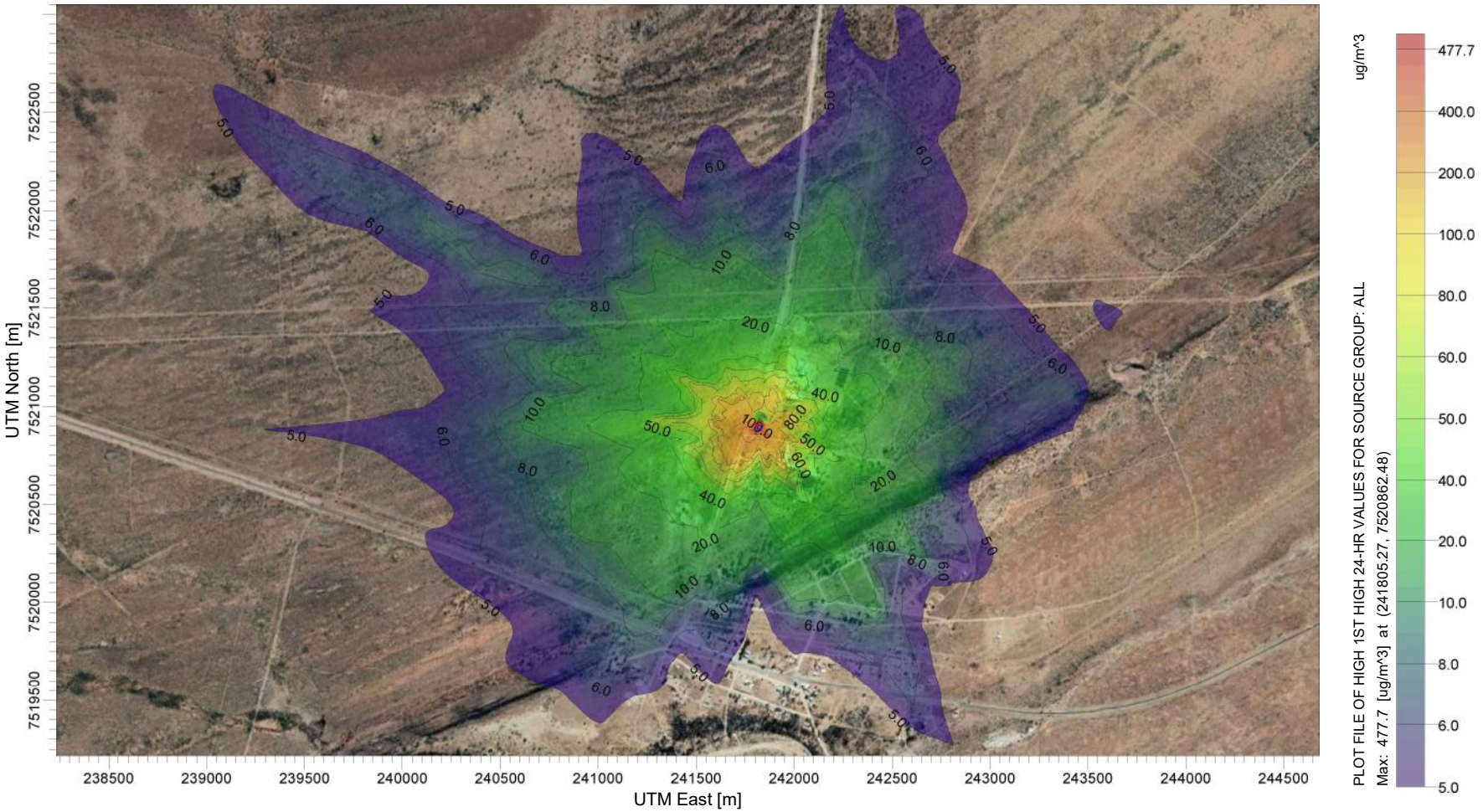


Figure 7-12: The Maximum Predicted 24-Hourly Average Concentrations of $PM_{2.5}$ (Uncontrolled)

Figure 7-13: The Maximum Predicted Annual Average Concentrations of $PM_{2.5}$ (Uncontrolled)

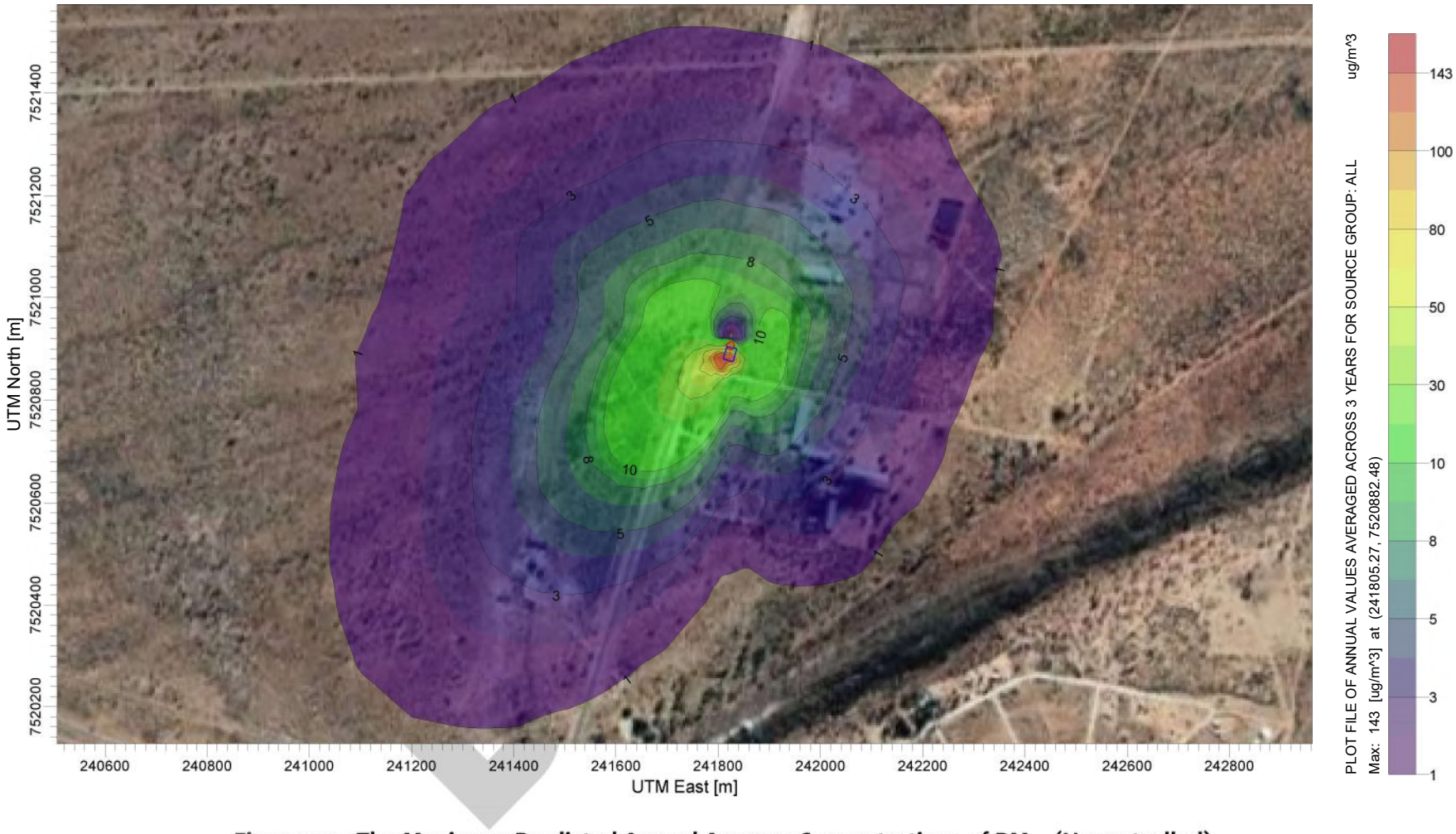


Figure 7-13: **The Maximum Predicted Annual Average Concentrations of $PM_{2.5}$ (Uncontrolled)**

Appendix D:
Land Tenure, Approvals and Licenses

1. **Proof of Land Ownership/ Authorisation for development/ Consent for Development**

WITVLEI VILLAGE COUNCIL

☎ (062) 570008 🖷 (062) 570375 ✉ P.O. Box 5, Witvlei secretary.witvleivc@iway.na

18 January 2021

The Managing Director
New Horizon Investment Group
3491 Amalek Street
Windhoek

E-Mail: berend@globalsmelters.com

Dear Sir,

PROVISIONAL ALLOCATION OF LAND FOR COPPER SMELTER

The Witvlei Village Council (WVC) at its Special Council Meeting cated 14 January 2021 and subsequent meeting on 18 January 2021 resolved as follows with Resolution Nr. CR 18/01/2021/01st SCM

The allocation is subject to you complying with the following:

1. WVC conditionally avails 4.6ha of land in the industrial area as per the attached plan.
2. WVC can unfortunately; not reserve the land indefinitely and would require realistic timelines from NHIG
3. NHIG to continuously update WVC with regards to the achievement of your set milestones
4. For WVC & NHIG to enter into a Public Private Partnership Agreement NHIG need to perform certain key aspects to meet the legal requirements to set-up the smelter and is subject to ministerial approval
5. NHIG to carry the costs associated with the surveying, planning and subdivision and servicing of said land with no liability towards Council

WITVLEI VILLAGE COUNCIL

☎ (062) 570008 (062) 570375 P.O. Box 5, Witvlei secretary.witvleivc@iway.na

6. NHIG to carry the costs for the environmental impact assessment to be conducted for the smelting project only
7. Residential land is available for inspection and satisfaction of NHIG

Please feel free to contact us should you need any further information in this regard.

Yours Faithfully,

Mr. Hendrik Muisoor
Chief Executive Officer

The Village Council
P.O. Box 5
19 JAN 2021
Witvlei

Appendix E:
EIA Team Resumes

1. Tendai E. Kasinganeti
2. Martin Shikongo

Environmental Assessment Practitioner

Curriculum Vitae

Name Martin K.L Shikongo

Tertiary Qualification
- Masters: Environmental Management(Stellenboch,2012),
- Bsc Honours , Environmental Management (UNISA,2009),
- Post Graduate Diploma: Development Finance (Stellenbosch,2016)
- Bsc Natural Resources (Unam, 2003).

Contact Information
P.O Box 41858 Ausspanplatz
Tel: +264 811225873, +264812595014
Email: ml26nam@gmail

PROJECT EXPIRIENCE

Project Name:	:	Construction of Trickle Filter Waste Water Treatment Plant
Project Summary	:	Environmental Impact Assessment (MRLGHRD)
Role and Responsibilities	:	Lead Environmental Specialist: Ecological and Social Impact Assessment
Involvement	:	2015
Project Name:	:	Improving Surface Water Quality in Windhoek Townships
Project Summary	:	Construction and Testing of small scale natural constructed wetland
Role and Responsibilities	:	Lead project coordinator: Project Design and Implementation
Involvement	:	2014
Project Name:	:	Sand Mining Baseline
Project Summary	:	Consulting service to conduct a Baseline survey of sand mining activities in Windhoek
Role and Responsibilities	:	Environmental Specialist : Project design and Contract administration
Involvement	:	2013
Project Name	:	Construction of Tourism Centre
Project Summary	:	Environmental Scoping Study for the Construction of Tourism Centre for the City of Windhoek
Role and Responsibilities	:	Environmental Impact Assessment Practitioner
Involvement		2008
Project Name	:	National Waste Management Audit
Project Summary	:	Data Collection: UNFCCC Green House Gas Inventory for the Ministry of Environment & Tourism
Role and Responsibilities	:	Waste Auditor (Walvisbay, Swakopmund , Arandis, Usakos, Windhoek)
Involvement	:	2014
Project Name	:	Environmental Impact Assessment for the Digital Terrestrial Television Infrastructure Rollout project for Namibia Broadcasting Corporation
Project Summary	:	Identification and assessment of potential environmental impact assessment
Role and Responsibilities	:	Visual Impact Specialist/
Involvement	:	2014
Project Name	:	Environmental Audit Project for NAMGEM Diamond Factory Okahandja
Project Summary	:	Health and Safety Compliance Audit

Role and Responsibilities	:	Auditor/Specialist Reviewer D& P Engineers
Involvement	:	2018
Project Name	:	Construction of Health Care Risk Waste Facility
Project Summary	:	Environmental Impact Assessment: City of Windhoek
Role and Responsibilities	:	Environmental Advisor. Develop Terms of Reference for Environmental Impact Assessment/BID Evaluation. Environmental Auditing
Involvement	:	2012
Project Name	:	Proposed Construction of //Oraseb Desert Camp Site (Erongo Region, *Dâures* Constituency) for Orabes developers cc
Project Summary	:	Environmental Scoping Report and Environmental Management Plan
Role and Responsibilities	:	Environmental Specialist.
Involvement	:	2011
Project Name	:	Feasibility Study for the BioSolids Project
Project Summary	:	Environmental Assessment for the proposed Bio Solids Garden Waste at Gammams Waster Care Works.
Role and Responsibilities	:	Project Environmental Auditor: Develop Terms of Reference for EIA consultants, Review of Specialist Studies & Environmental Impact Assessment Report.
Involvement	:	2010
Project Name	:	Establishment of Community Campsite for Otjimboyo Conservancy
Project Summary	:	Feasibility Study for Tourist Camp Establishment
Role and Responsibilities	:	Environment & Socio Economic Assessment
Involvement	:	2006
Project Name	:	Land Use Planning for Communal Conservancies
Project Summary		Development of Natural Resource Management Plans for the /Ganaseb(/Karas Region), Tsiseb (Uis,Erongo) , Sorris Sorris , Doro !Nawas(Khorixas, Kunene) , /Audi Conservancy (Fransfontein, Kunene) Conservancies
Role and Responsibilities	:	Natural Resource Coordinator. Natural Resource Mapping through the application of GIS, Community Mobilization
Involvement	:	2006
Project Name	:	Middel Ugab Basin Management
Project Summary	:	Baseline Assessment of Forestry Resources
Role and Responsibilities	:	Project Design and Coordination. Natural Resource Inventory
Involvement	:	2006

Evidence Tendai. Kasinganeti

Contact: Unit 19 Reinush Courts, Long Island Street, Rocky Crest, Windhoek
Emails: ekasinganetie@gmail.com
Skype I.D: Evidence Tendai Kasinganeti
Cell: +264813634904

Environmental Management and Spatial Analysis professional *(Environmental Assessment & Management, Nature Conservation and Climate, Spatial Analysis, GIS Mapping and Scientific Research)*

Career Objective: To acquire technical proficiency with all up-to-date competence, taking into cognisance, the ever-changing socio-economic environment and the justified need for technically, intellectually and sustainable founded personnel in the present-day firms operating under an ever-changing course of unpredictable activities. I believe in gradual development of personality, which shall not be compromised with workmanship and good citizenship. My main inspiration is to make History by shaping the future

Future Endeavors: To develop my career and participating in the achievement of sustainable development goals through research and education to the highest level possible in environmental Management, Pollution control, sustainable development, land management and Geographic Information Science and Remote Sensing

Area of Expertise:

- Environmental Assessment & Management
- GIS and Remote Sensing,
- Ecological mapping and assessment
- Water, air and Soil quality management

Professional Qualifications:

1. **Bachelor of Science in Geography and Environmental Studies Honors Degree** (Midlands State University, Zimbabwe, 2015). (2.1/ Upper Second Class)
2. **MSc Geographic Information Science and Earth Observation (Natural Recourses Management)** NUST-Namibia (Ongoing)
3. **Certificate on Going Green For Social Entrepreneurs** (Young African Leaders Initiative Network, USA, 2016)
4. **Fundamentals of Health and Safety in the Workplace** (Allison International, Ireland, 2016
5. **Introduction To Ecosystem Service Valuation And Policy Design** (RESMOB Namibia, 2018)
6. **Environmental Management Systems ISO 14001, 2014.** (Allison International, Ireland, 2020)

Key Competencies

- Experience in Environmental, Social Impact Assessment
- Marine and coastal areas management and monitoring
- Field baseline studies (Social, Fauna, Flora, Hydrology)
- GIS mapping and Remote Sensing Image Processing (Envi, ArcGIS, QGIS, Google Earth, Spatial databases, Python, R Statistica, Web mapping, GIS Programming)
- Environmental Quality monitoring, management and auditing (effluent, emissions)
- Project Planning and Management
- Able to work independently or as a member of multi-disciplinary and multicultural team.
- Good knowledge and understanding of Microsoft Office, SPSS, STATISTICA,

Available for:

Job opportunities

Consultancy

Research & Knowledge contribution

Highest Qualification:
BSc Honors Degree

Years of Experience:
5 years (hands on)

Languages:
English, Shona, Ndebele; Oshiwambo

Date of Birth:
27 November 1991

Sex: Male
Single

Driver's License
Class 4: Passenger vehicle (Code B)
(Own Vehicle)

Passport number CN022271(Valid Namibian Work Permit)

Professional Registration:
-(IAIA) South Africa 2016
-Environmental Economics Network of Namibia (EENN)
-Environmental Assessment Professionals Association of Namibia - EAPAN

Professional Experience

1. MAY 2018 TO DATE

Position: (ADHOC) Environmental Specialist – D& P Engineers and Environmental Consultants

Duties and Responsibilities
The role involves providing professional consulting services to clients in Namibia with particular focus on Environmental Impact Assessments, Environmental control and monitoring, Environmental Quality Management, Environmental Reporting, Spatial Planning through GIS, Training, Stakeholders engagement as well as Employee Health and Safety management. The Major roles included the following:

Coordinating and managing environmental management projects i.e.:
-Proposal writing, projects negotiations, public consultation, information collation, report writing and communication of findings.
-Traveling regularly to conduct site baseline investigations, public meetings, client liaison and workshops.
-Technical Compilation of Environmental Impact Assessments for different Projects.
-Environmental and Social Management Plans development, implementation, monitoring and updating
-Project Environmental control and monitoring (ESMP compliance, Induction, water and soil quality monitoring)
-Sensitivity mapping (fauna and flora)

Providing Spatial Planning support for land Planning projects i.e.:

-GIS mapping (hydrology, Geology, soils, vegetation, locations etc.)
- Remote sensing (base map acquisition, UAV launching and imagery processing)
-Sensitivity mapping for different sites for proposed developments
-Generate thematic maps on new projects proposed
-Generate maps on data imported from AutoCad

2. PART TIME: FROM APRIL 2017 TO APRIL 2018

Position: Environmental Consultant (Sub-Consultant) – Environmental Compliance Consultancy (ECC), Namibia

Position: Environmental Practitioner and Consultant

Duties and Responsibilities

- The role involves providing professional consulting services to clients in Namibia with particular focus on approvals, Environmental Clearance Certificates, reporting and environmental compliance facilitation for different clients in mining, agriculture, manufacturing and energy

- Providing professional consulting services to clients in Namibia with focus on EIAs, EMPs reporting and implementation and compliance advisory on the following:

  -Environmental Clearance Certificate (ECC) Approvals
  -Environmental Scoping studies
  - EMPs drafting and Implementation
  -Mine rehabilitation and ECC renewals
  -Environmental Auditing
  -Conducting field visits on assigned projects
  -Generation of GIS Maps for project sites and specialist studies.

3. PAST: JANUARY 2016 TO FEBRUARY 2017

Position: Environmental Planner-–Plan Africa Consulting cc (Namibia)

Duties and Responsibilities

- Coordinating and managing Environmental Impact Assessment Studies:
  -Proposal writing, projects negotiations, public consultation, information collation, report writing and Communication of findings.
  -Traveling regularly to conduct site baseline investigations, public meetings, client liaison and workshops.
  -Technical Compilation of Environmental Impact Assessments for different Projects.
- Implementation and Monitoring of the Environmental Management Plans
- GIS mapping (hydrology, Geology, soils, vegetation, locations etc.)
- Land Use Mapping and Zoning
- Conducting Bio-Physical Surveys for prescribed projects
- Attending to Issues raised by the MET concerning different EIA and EMP documents Submitted.
- Filing of EIA documentations (Questionnaires, communications, emails, maps, plans, etc.)
- Conducting project administrative tasks such as Clientele liaison and project budgeting
- Taking part in Specialist studies mainly hydro-geology and vegetation.
- Working together with supervisor in developing environmental assessment and management capabilities through developing networks, growing the business and building new competencies.

4. JULY 2013 TO DECEMBER 2015

Position: Junior Consultant (Environmental Assessment Practitioner)-New World Advisory Services (NWAS) Environmental Consultants (Zimbabwe)

Duties and Responsibility

- Baseline surveys for EIA projects (Social, ecological, economic and political impact Assessment
- Environmental Management Development and Implementation
- Conducting public and stakeholder consultation process
- Surface and Underground Water Modelling (GIS)
- Compiling Environmental and Social Impact Assessment Reports for different projects
- Environmental Compliance Auditing and Quarterly Reports
- Implementation and monitoring of ISO 14001 and ISO 18001 Systems
- Soil and water samples processing (Sample collecting, sending for lab tests and interpretation of results)
- Air emissions monitoring and testing
- Social Impact Assessment & Social Corporate Responsibility Plans
- Project Management for projects assigned to.

5. ENVIRONMENTAL IMPACT ASSESSMENT PROJECTS UNDERTAKEN

2015

1) African Distillers New production Plant Installation, Harare-Zimbabwe
2) Feruka Oil pipeline Upgrade Project, Beira, Mozambique to Mutare, Zimbabwe
3) Gwenyaguru 7 Mini Hydro Power plants installations, Manicaland Province-Zimbabwe
4) Pactser Cement Manufacturing Plant, Redcliff-Zimbabwe
5) Penhalonga Lead Mine establishment Penhalonga-Zimbabwe

2016

6) FKB Legacy Estate Township Establishment Project, Uukwangula-Namibia
7) King Nangara Lodge and Camp Sites establishment project, Rundu-Namibia
8) GeoNamib Minerals cc Stone Quarry and Crusher, Omakange-Namibia
9) Range Properties Acacia Park Township Establishment Project, Rehoboth –Namibia
10) Tses Glass Manufacturing plant and Silica processing Plant, Tses Village, Karas and Oshikango-Namibia

2017

11) BMNG Truckport and Service Station Establishment, Keetmanshoop-Namibia
12) Gobabis Extension 11 Township Establishment Project, Gobabis-Namibia
13) Kavango Country Lodge and Truckport Establishment Project, Rundu-Namibia
14) Keetmanshoop Private Hospital, Keetmanshoop Namibia

15) Kunene Regional Council Advanced Immobilized Cell Reactor Sewage Treatment Plant Establishment, Sesfontein-Namibia
16) Okahandja Sand Mining Project for Highway upgrade, Okahandja-Namibia
17) Onyika Oil and Energy cc Tyre Recycling Pyrolysis Plant-Groot Aub, Namibia
18) Engen Namibia, Environmental Management Plans for all Engen Service Stations (Nationwide), Namibia

2018

19) Rietoog 5MW Solar power Plant construction and operation, Rietoog-Namibia
20) Subdivision of ERF 2292 of Keetmanshoop Town, Keetmanshoop –Namibia
21) GCH Investments cc Construction of residential Flats in Okahandja, Okahandja Namibia
22) Le'Monte Village Township Establishment, Grootfontein Namibia
23) Okondjatu Truckport and Service Station, Okondjatu Namibia
24) Keetmanshoop dumpsite Integrated Solid Waste Management Project, Keetmanshoop-Namibia
25) Guantagab Tin and Tantalum mining project, Uis-Namibia

2019

26) Karasburg Town Council Landfill decommissioning Plan, Karasburg, Namibia
27) Karasburg Town Council, New Dumpsite Siting, Design Specifications, Construction & Operational Management Plan, Karasburg-Namibia
28) Otjiwarongo Municipality Dumpsite remodeling Environmental Management Plan and development of guidelines for Municipal Integrated Solid Waste Management Strategy
29) African Development Bank: Strategic Environmental and Social Assessment and development of an Environmental and Social Management Plan for the Namibia Water Sector Support Project, covering All Regions of the country (24 projects), Namibia
30) Buruxa Fuel Construction and Operation of Fuel Station in Sorris Sorris, Namibia
31) Walenga Poultry project, Ondangwa, Namibia
32) Maano and Onesmus Small Scale integrated farming project, Brakwater, Windhoek-Namibia

2020

33) Environmental Impact Assessment for the proposed Bukalo Meat Processing Facility, Katima Mulilo-Namibia
34) Environmental Impact Assessment for the proposed Feedlot at Katima Farm, Katima Mulilo-Namibia
35) Environmental Impact Assessment for the proposed Feedlot at Musese Green Scheme, Nkurenkuru-Namibia
36) Environmental Impact Assessment for the proposed Feedlot at Etunda Green Scheme, Omusati Region-Namibia
37) Environmental Impact Assessment for the Prospecting of Precious Stones On EPL 3218 (Informally Known As Block 3) – Along The Orange River – Karas Region
38) Environmental Impact Assessment for the prospecting of Base and Rare Metals, Industrial Minerals, Non-Nuclear Fuel Minerals, Precious Metals and Precious Stones Groups of minerals on EPLs 4941, 5296 and 5392 in Karibib, Namibia
39) Environmental Impact Assessment for the Proposed Mineral Exploration Activities on EPL 5846 In Omusati Region-Namibia

6. Other relevant information (e.g., Publications)

Publication:

Socio-ecological impact of telecommunication base transceiver stations across Mutare District, Eastern Zimbabwe: Environmental impact of cell phone towers, 2018- Annals of and Behavioral Sciences Journal Social Volume 3 (1) , 2018

REFEREES

Referee	Referee	Referee
Mr. Timo David **D&P Engineers and Environmental Consultants** Managing Director Project Management Division 17 Parsival Street, Office 9 & 10, Korrigan Building, Windhoek-Namibia Telephone: +264081299 8444 Email: tdavid@dpe.com.na	**Mr. Anderson Muchawona** **NWAS PVT (Ltd) Environmental Consultants** Director: Environmental &Spatial Services First Floor Manica Chambers Hebert Chitepo St, Mutare, Zimbabwe Mobile: +263772644040 Email: anderson@nwas.co.zw www.nwas.co.zw	**Mr. Henry Krone** **Plan Africa Regional and Town Planners** **Director-Planning** Number 8 Delius Street Windhoek West Namibia Mobile: +264812716189 Email: paffrica@mweb.com.na

Dr Sudhanshu Kumar, PhD

AREAS OF EXPERTISE

Air and Noise Environment
Environmental Impact Assessment
Environmental Management Planning
Environmental Information Management System Development and implementation
Meteorological Data Processing (WRF)

SECTORAL EXPERIENCE

Thermal Power Plants
Dredging and Reclamation
Petrochemical Refineries
Highways and Bridges
Mining
Urban/Township Developments and Construction Supervision

YEARS OF EXPERIENCE

26 Years

EDUCATION

PhD, Environmental Sciences,
Magadh University, **2007**
MSc, Environmental Sciences,
Magadh University, **1995**
BSc (Hons.), Botany
Ranchi University, **1991**

AFFILIATIONS

Member,
Indian Association for Air Pollution Control, New Delhi
Member, Indian Science Congress

COUNTRIES OF WORK EXPERIENCE

India, UK
Bahrain, Saudi Arabia
UAE and
Qatar

COMPUTER PROGRAMMING

VB, Fortran, C++
PHP,
JavaScript
Python,
MySQL

OVERVIEW

Dr Sudhanshu Kumar is Director of Technical Services and **Co-founder** of Envitrans®. At Envitrans he is leading the interdisciplinary team of professionals and looking after the environmental consultancy services and software development and conducting training program. He has **26 years' experience** in managing and conducting various Environmental Impact Assessment, Management Planning and Software Development Projects in India and abroad. As **accomplished trainer**, he has conducted several workshops on specialty air dispersion modelling topics in India.

He is **specialized in air pollution meteorology, air dispersion mathematical modelling**, and acoustic remote sensing of Planetary Boundary Layer (PBL) using SODAR technique. He is well experienced with U.S. EPA air dispersion models like AERMOD, CALINE, FDM and AERSCREEN *etc*.

He is the **lead author** in developing AERMOD Cloud®, FDMpro, CALINEpro and dhwaniPRO® software at Envitrans. AERMODCloud® is an integrated GUI for US EPA models AERMOD, AERMAP, AERMET and ISCST3.

He was an **Expert Member of State Expert Appraisal Committee**, Bihar, constituted by MoEF&CC, Government of India**.** He was also **NABET accredited Functional Area Expert** in Air Quality and Noise.

Dr. Kumar earned a **PhD in Environmental Sciences** for his research work relating to the impact on air pollutant dispersion due to the meteorological stratification in lower atmosphere, from Magadh University.

He served as a **Principal Environmental Consultant** in the **URS Scott Wilson India** (now **AECOM**) prior to joining Envitrans

ACHIVEMENTS

1. Appointment as Member of State Expert Appraisal Committee of Bihar by the Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India (http://ismenvis.nic.in/Database/Notification_13th_July_2018-SO3447E_19035.aspx)
2. Co-founding Envitrans, India's first private company, which
   a. Developed and commercially supports the graphical user interfaces for the environmental modelling software like AERMOD, CALINE, FDM.
   b. Provide meteorological data services - disseminate historical and forecast meteorological data using Weather Research Forecast (WRF) model
3. Lunching of https://www.indianclimate.com, a web portal which provide free meteorological data on demand of any coordinate in India.
4. Development of the project DIANA, which gained the Commendation Certificate in the British Expertise International Awards 2009/10. DIANA was an online Environmental Data Management System for Dredging and Reclamation Project, the first online environmental data management system in Gulf.

PROFESSIONAL EXPERIENCE

2013 – Present
Envitrans Private Limited, Ghaziabad, India
Director of Technical Services and Co-Founder

Leading the interdisciplinary team of professionals and looking after the environmental consultancy services and software development and conducting training programs. Besides responsible for the overall growth of the organization.

Developed atmospheric dispersion models GUI - AERMODCloud®, FDMpro, CALINEpro and noise model dhwaniPRO® software. AERMODCloud® is an integrated GUI for US EPA models AERMOD, AERMAP, AERMET and ISCST3 widely using for EIA studies in India.

Responsible for the setup of meteorological data processing and forecasting facilities at Envitrans, making India's first private organization to do so.

2018 – 2021
State Expert Appraisal Committee, Bihar
Member

State Expert Appraisal Committee is constituted by the Ministry of Environment, Forest and Climate Change, Government of India to appraise various project as per the Environmental Impact Assessment Notification 2006.

2017 – 2019
Adjunct Faculty, Anand International College of Engineering, Jaipur

Adjunct Faculty (Part-Time) of School of Basic & Applied Sciences at Anand International College of Engineering, Jaipur. Deliver lecture on the topic of ambient air and noise quality.

2012
URS Scott Wilson India Pvt Ltd, New Delhi, India
Principal Environmental Consultant

As Environmental Specialist, supervised ADB funded highways construction projects in Bihar and Madhya Pradesh. Completed various EHS, Environmental Compliance Audit and

CHWMEG Audits for various projects across India.

2007 – 2011
URS/Scott Wilson Limited, Bahrain
Environmental Team Leader

Co-supervised the first ever comprehensive environmental management plan in Bahrain at Diyar Al Muharraq. Gained appreciation for the development and implementation of online environmental information management system on several dredging and reclamation projects in Bahrain including the 24,000ha Diyar Al Muharraq development project.

Demonstrated the in-house ability at Bahrain Office to provide specialized services like Atmospheric Dispersion Modelling, Noise Propagation Modelling and Quantitative Risk Analysis. Besides, completed EIA and EMP studies for various dredging and reclamation projects.

2006 – 2007
DHV India Private Limited, New Delhi, India
Senior Environmentalist

Accomplished the environmental assessment task for the Japan Bank for International Cooperation funded project relating to the sewerage and drainage plans under Yamuna Action Plan II for the eight towns in Uttar Pradesh, India.

Coordinated and prepared the Initial Environmental Examination Report (IEER), Odour Assessment and Environmental Impact Assessment Reports (EIA) in compliance with JBIC requirements incorporating the Ministry of Environment and Forests (Govt of India) Guidelines and Honourable Court's directives for Yamuna Action Plan.

2004 – 2006
Scott Wilson Kirkpatrick (India) Pvt Ltd, New Delhi
Assistant Environmental Specialist

Managed and successfully implemented the environmental management plans on four World Bank funded Road Up gradation projects (total length 400km) in Uttar Pradesh, India which was appreciated by the Client and the World Bank.

Participated actively in the execution of social and Resettlement & Rehabilitation plan for the affected people along the roads with the NGOs. Organised training programme for Client's officials, Contractors and other Stockholders on Environmental and Social issues relating to highway projects.

2004
Intercontinental Consultants & Technocrats Private Limited, New Delhi, India
Manager (Environment)

Modelled the volume and flow of fresh air required to maintaining the safe CO level within the two new 7-8 km long tunnel proposed on National Highway 1A.

Coordinated among the NHAI, UP Pollution Control Board, Faizabad and three Forest Divisions for the Environmental and Forest Clearances for the proposed Ayodhya Bypass.

2001 – 2004
Mantec Consultants Pvt Ltd, New Delhi, India
Senior Environmental Consultant & Government Analyst

Managed a team of nine environmental professionals and the Ministry of Environment and Forests approved Environmental Laboratory. Appointed as Government Analyst at the Environmental Laboratory through Gazette Notification.
(http://envfor.nic.in/legis/env/so1174e.pdf)

Coordinated and presented quite a few Environmental Impact Assessment (EIA) Studies and Environmental Data Generation Projects for Super Thermal Power Stations, Petrochemical Refinery, Fertilizer Plant and Airport. Besides, carried out several Atmospheric Dispersion/Noise Modelling assignments for various industrial projects.

Supervised two Postgraduate students for their project dissertation on Medical Waste Handling and Management.

1997 – 2001
Envirotech Centre for Research & Development, New Delhi, India
Senior Environmental Scientist

Supervised and trained the air quality and meteorological data generation team, including a M.Tech student for his project dissertation on air quality study. Trained on Acoustic Remote Sensing of Lowe Planetary Boundary Lays and played a key

role into the development of Monostatic SODAR (SOund Detection and Ranging) though the field studies.

Coordinated and supervised a research project on air pollution load carrying capacity in Satna. Later, did my PhD thesis using the filed data of this project.

Derived an empirical relation to determine the mixing height from the interpretation of SODAR echograms in valley like conditions.

1995 – 1997
Central Fuel Research Institute, CSIR, Dhanbad, Jharkhand, India
Project Assistant

Worked in Environmental Laboratory and carried air, water and soil analysis. Trained on ambient air, source emission and noise monitoring. Trained on weather station installation, meteorological data recording and analysis

SOFTWARE DEVELOPMENT PROJECTS

AERMOD Cloud®: Development of Air Dispersion Modelling Software user interface for US EPA models ISCST3 and AERMOD, AERMET, AERMAP. (*https://aermodcloud.com*)

dhwani PRO®: Development of free field sound propagation model based on ISO 9613-2 General noise calculation model.

CALINEpro: GUI for vehicular traffic modelling software based on CALINE3 algorithm.

FDMpro: GUI for fusitive dust modelling software based on US EAP FDM model algorithm.

Pavanaarekh: Wind rose plotting software. (*https://pavanaarekh.com*)

Indianclimate.com: Web portal for coordinate specific meteorological data within India. (*https://indianclimate.com*)

DIANA: web based environmental monitoring data management software

PUBLICATIONS

- Sudhanshu Kumar, Monitoring Suspended Solid, Construction Week, pp14, December 2009.
- Bihari Singh, Sudhanshu Kumar and G.K.Singh, A modelling assessment of vehicular pollution in Satna, Paper accepted for 92nd Indian Science Congress, Environmental Section, January 3-7, 2005.
- S.P.Singal, R.Prasad, Rakesh Agrawal and Sudhanshu Kumar, Application of Sodar Data in Studies related to air quality of Satna region, India, Proceedings 10th International Symposium on Acoustic Remote Sensing of the Atmosphere and Ocean, Auckland, New Zealand, 27 November - 1 December 2000.
- Sudhanshu Kumar and S.P.Singal, Sodar Study of the complex boundary layer, Paper accepted for presentation, National Symposium on Acoustics (NSA-1998), December 18-20, 1998.
- S.P.Singal and Sudhanshu Kumar, Sodar studies of air pollution associated meteorological parameters in the hills of Assam, India, Proceedings 9th International Symposium on Acoustic Remote Sensing of the Atmosphere and Ocean, Vienna, pp 302-305, 1998.

CONTACT INFORMATION

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