

PLAN OF STUDY FOR EIA



**PLAN OF STUDY FOR
ENVIRONMENTAL IMPACT
ASSESSMENT (EIA) FOR THE
PROPOSED CONSTRUCTION
AND OPERATION OF THE
CAUSTIC SODA MAKE-UP
PLANT IN CHLOORKOP,
KEMPTON PARK, EKURHULENI
METROPOLITAN – GAUTENG
PROVINCE**



Report Prepared for:



4th Floor, The Central,
Rivonia Road Sandton
Republic of South Africa

Contact: +27 (0) 10 035 4249
Fax: +27 (0) 86 600 0317 2196
Email: info@africhemicals.co.za

Report Prepared by:



Batach Holdings Building No. 8, 1st Floor, Thornhill Office Park, 94 Bekker road, Vorna Valley, Midrand, 1686
Tel: + 27 (0) 61 358 8423 Fax: +27 (0) 86 679 6758 Email: info@batach.co.za

Reviewed by: BATACH HOLDINGS PTY Ltd

Lucky Msimanga (EAP)

Lead: Environmental Assessment Practitioner

Email: Lucky@batach.co.za

Authors:

Lucky Msimanga

Dr Thomas Gyedu-Ababio

Plan of Study for the Proposed Construction and Operation of the Caustic Soda Make-Up Plant in Chloorkop, Kempton Park, Ekurhuleni Metropolitan – Gauteng Province

Caustic Soda in solid flakes & lye form

Document Control

**ENVIRONMENTAL AUTHORISATION APPLICATION: PLAN OF STUDY FOR THE PROPOSED
CONSTRUCTION AND OPERATION OF THE CAUSTIC SODA MAKE-UP PLANT IN EKURHULENI
METROPOLITAN, CHLOORKOP, KEMPTON PARK – GAUTENG PROVINCE**

AUTHORITY REF NUMBER GDARD REF. NO	OUR REF NUMBER
GAUT 002/20-21/E2748	POS0046EBAT2021

DOCUMENT TITLE	ACTION	NAME	DESIGNATION	DATE	SIGNATURE
PoS	Prepared by	Lucky Msimanga	Lead Environmental Scientist	10 MAY 2021	
Vers. 1.0	Reviewed by	Dr. Thomas Gyedu Ababio	Scientist	10 MAY 2021	

TABLE OF CONTENTS

GLOSSARY OF TERMS	6
1. INTRODUCTION	7
2. PURPOSE OF THE PLAN OF STUDY FOR EIA	7
3. ENVIROMENTAL ISSUES IDENTIFIED DURING SCOPING	8
4. STAGES OF THE STUDY	9
4.1 EIA PHASE	10
5. PROPOSED APPROACH AND METHODOLOGY	11
5.1 MHI & HEALTH AND SAFETY RISK ASSESSMENT STUDY	12
5.2 AIR QUALITY IMPACT ASSESSMENT:	12
5.3 SURFACE AND GROUNDWATER IMPACT ASSESSMENT:.....	13
5.4 WASTE MANAGEMENT ASSESSMENT STUDY:	14
5.5 SOCIO-ECONOMIC IMPACT ASSESSMENT STUDY:.....	15
5.6 TRAFFIC IMPACT ASSESSMENT:.....	15
5.7 SPECIALIST STUDIES.....	16
1.1 DESCRIPTION OF THE AFFECTED ENVIRONMENT	16
6. PUBLIC PARTICIPATION	17
6.1 ADVERTISING.....	17
6.2 INTERACTION WITH GDARD, AND PROVINCIAL DEPARTMENTS AND MUNICIPALITY	18
6.3 DEVELOPING A STRATEGY AND RESOLVING KEY ISSUES.....	18
6.4 PUBLIC INPUT	18
7. IMPACT ASSESSMENT METHODOLOGY	19
7.1 CRITERIA USED FOR THE RATING OF IMPACTS.....	20
7.2 STATUS OF IMPACT.....	20
7.3 EXTENT OF THE IMPACT	21
7.4 DURATION OF THE IMPACT.....	21
7.5 MAGNITUDE OF THE IMPACT	21
7.6 PROBABILITY OF OCCURRENCE.....	21
7.7 SIGNIFICANCE OF THE IMPACT	21
7.8 IMPACT IDENTIFICATION AND ASSESSMENT	22
7.9 MITIGATION AND PREVENTION MEASURES	22
8. METHODS OF IDENTIFYING ALTERNATIVES	24
8.1 PROJECT ALTERNATIVES	24
8.2 TECHNOLOGY	25
8.3 LOCATION	25
8.4 SITE LAYOUT ALTERNATIVE.....	25
8.5 NO-GO ALTERNATIVE	26
8.6 COLLATING AVAILABLE INFORMATION AND IDENTIFYING KNOWLEDGE GAPS	26
9. CONCLUSION	27

GLOSSARY OF TERMS

EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMM	Ekurhuleni Metropolitan Municipality
EMP	Environmental Management Plan
EMSDF	Ekurhuleni Metropolitan Spatial Development Framework
GDARD	Gauteng Department of Agriculture and Rural Development
IDP	Integrated Development Plan
NEMA	National Environmental Management Act
SAHRA	South African Heritage Resources Agency
SIA	Social Impact Assessment

I. INTRODUCTION

African Chemicals has appointed BATACH HOLDINGS (PTY) Ltd as the independent environmental consultants to identify and assess the potential environmental impacts associated with the proposed construction and operation of the Caustic-UP Plant.

African Chemicals (Pty) Ltd (AC) is a South African based bulk chemicals production, marketing and distribution company focused on supplying products and services to the African industrial market. The company established in 2014 and after two years of preparation and structuring incorporated in 2016. It was born from years of market analysis of the global and domestic chemicals markets.

AFRICAN Chemicals (AC) proposes to construct and operate a Caustic-Make-up plant. The proposed construction and operation will be situated at **ERF No 198**, of the farm Chloorkop-IR, within the City of Ekurhuleni metropolitan in Gauteng Province. The proposed development aims to operate **autonomously with its own proposed two entrances, security access, weighbridge, warehouse, production facility, tank farm, staff and technology**. African Chemicals (AC) wishes to import dry caustic and transport it to the newly proposed facility in Johannesburg, Chloorkop where it can be dissolved into lye form and loaded into customer tanker trucks or Intermediate Bulk Containers (IBC). The dissolution, storage and loading will all form part of the **Caustic Make-up Plant**. . The aim of this operation is designed to be fully automated and the make-up tank will be fed through weigh feeders, which will ensure consistent product quality.

2. PURPOSE OF THE PLAN OF STUDY FOR EIA

This Plan of Study for EIA is intended to provide a summary of the key findings of the Scoping Phase and to describe the activities to be undertaken in the Impact Assessment Phase of the EIA process.

According to the Environmental Impact Assessment Regulations, 2014, published under Government Notice No. 982 in Gazette No. 3822 of 4 December 2014, in terms of sections 24(5) and 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998). The regulation as prescribed in Appendix 2 (2) (1)(h) of Government Notice, the document is required to provide the following: The EAP will ensure that the entire process is undertaken as dictated by the Regulations.

h) a plan of study for undertaking the environmental impact assessment process to be undertaken, including—		
(i)	a description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity	Section 8
(ii)	A description of the aspects to be assessed as part of the environmental impact assessment process;	Section 5
(iii)	Aspects to be assessed by specialists;	Section 5.7
(iv)	a description of the proposed method of assessing the environmental aspects, (including a description of the proposed method of assessing the environmental aspects) including aspects to be assessed by specialists;	Section 5.7 & 5.8
(v)	a description of the proposed method of assessing duration and significance;	Section 7.7
(vi)	An indication of the stages at which the competent authority will be consulted;	Section 4
(vii)	Particulars of the public participation process that will be conducted during the environmental impact assessment process; and	Section 6
(viii)	a description of the tasks that will be undertaken as part of the environmental impact assessment process;	Section 5
(ix)	identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.	Section 7-7.9

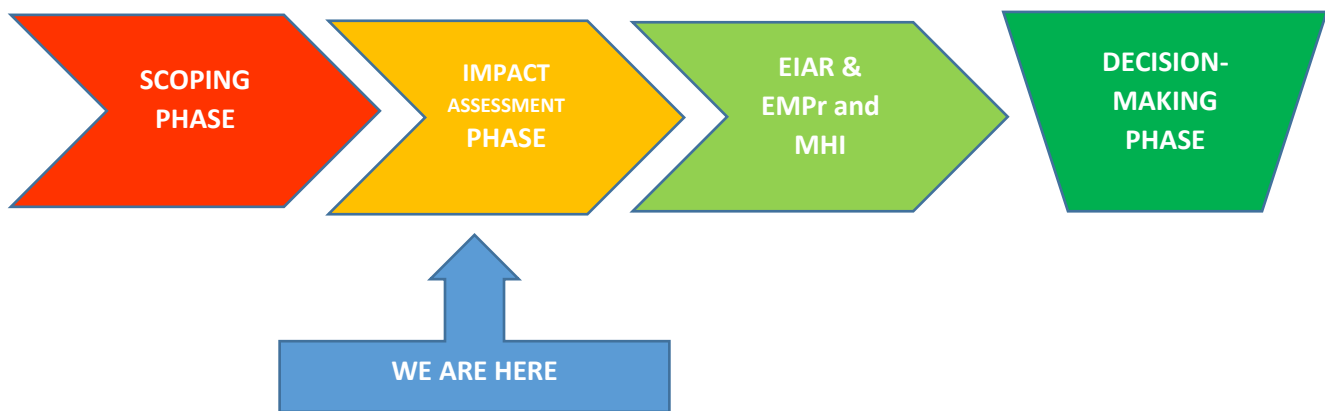
3. ENVIRONMENTAL ISSUES IDENTIFIED DURING SCOPING

The primary environmental issues identified during the Scoping Phase were determined through a process of analyzing the project scope of work (PSoW) and activities and the potential sources of impacts. The initial focus of the Scoping process was on the site alternatives that exist for the Proposed Construction and Operation of the Caustic Soda Make-Up Plant project. This culminated in a desktop analysis; revision of existing information; historical data; consultation with I&APs and various site visits with the EIA team as well as independent site visits undertaken by the specialist team. The site visits were aimed at getting a view of the study area, thereby enabling the specialists and the EAP to conceptualize the study area.

Preliminary discussions on the status quo of the study area are included in this Draft Scoping Report attached herewith, which serves as a guide to the exploration of the alternatives. The issues identified were grouped into broad categories including the physical, bio-physical and socio-economic. During the EIA phase, the specialist studies will need to further examine the key impacts of each of the alternative sites; following which the significance of these impacts will be assessed in the EIA Report.

4. STAGES OF THE STUDY

In line with the requirements of the NEMA EIA Regulations, the EIA report provides a detailed description of the pre-development environment, specifically in terms of the biophysical and socioeconomic environment of the study area. The report provides comprehensive description of the activities as well as numerous specialists studies undertaken for the EIA Phase and Public Participation Process (PPP), as well as the way forward in the form of conclusions, recommendations and a draft Environmental Management Programme (EMPr) and MHI.



The Environmental Impact Assessment phase will be required for this project; therefore this plan of study proposes the approach and methodology of undertaking this phase.

(vi) An indication of the stages at which the competent authority will be consulted.

The stages at which GDARD will be consulted are:

- ❖ Pre-application meeting – October 2020
- ❖ Application stage
- ❖ Consultation during the comment period on the Draft Scoping Report – March-July 2021
- ❖ Consultation during the comment period on the Draft EIA Report – June-August 2021

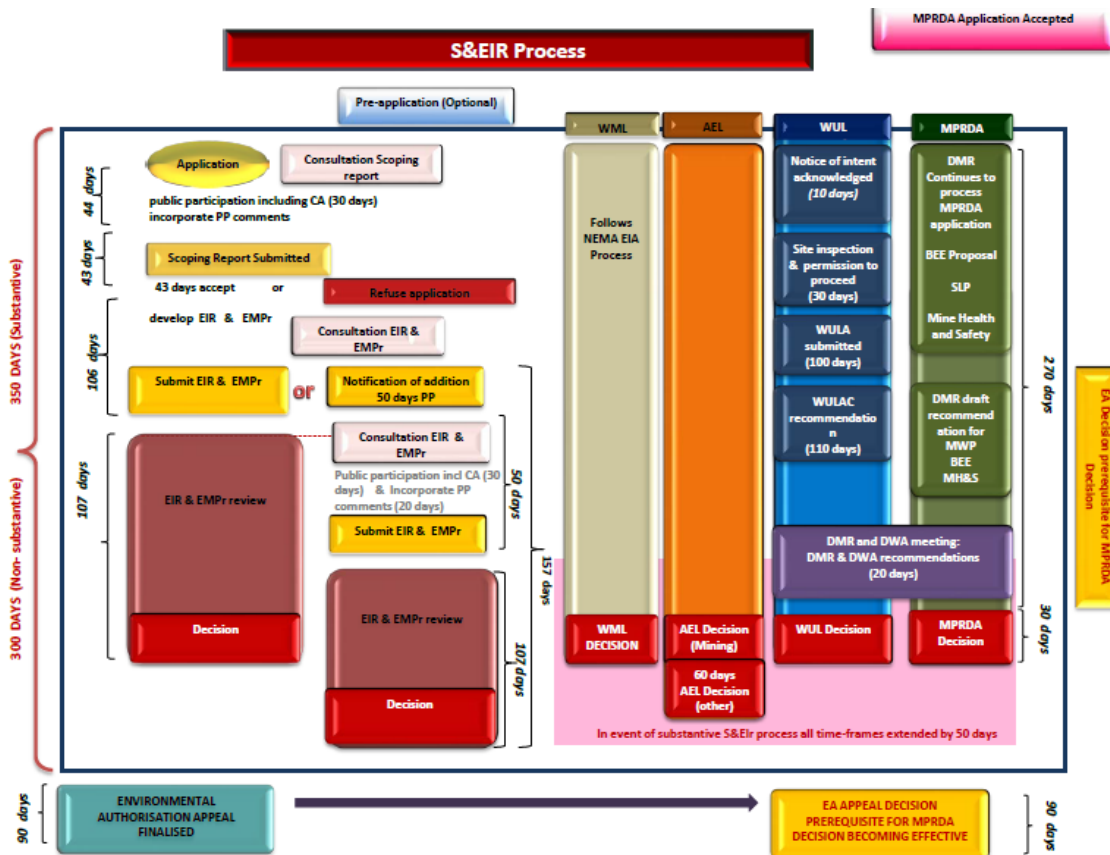
The EIR will be developed in the next stage and reviewed by the I&AP's, authorities and key stakeholders. The Report is to be submitted and distributed to:-

- ❖ GDARD (Gauteng Department of Agriculture & Rural Development)
- ❖ City of Ekurhuleni Metropolitan Local Municipality (EMM)

- ❖ Public Places such as Library; selected school
- ❖ South African Heritage Resources Agency;
- ❖ Department of Health
- ❖ Department of Transport
- ❖ Registered Interested & Affected Parties
- ❖ Department of Water and Sanitation; and
- ❖ Batach Holdings website.

4.1 EIA PHASE

The EIA process will be undertaken as set out in the EIA Regulations of December 2014 as depicted in Figure below. The sections that follow will describe the purpose and procedure behind each phase. The following are the terms of reference for the completion of the EIA study and the purpose thereof:



The Environmental Impact Assessment procedures set out by the EIA Regulations (December 2014) will be followed in carrying out the application process with the relevant authorities.

- ❖ Conduct consultation with the Authorities, Interested and Affected Parties through a social facilitation process;
- ❖ Find mechanisms for addressing in more detail, issues raised during the Public Participation Process;
- ❖ Evaluate concerns and prioritize important and detrimental issues which need to be addressed;
- ❖ Address issues that were raised during the Scoping Phase;
- ❖ Assess alternatives to the proposed activity in a comparative manner;
- ❖ Assess all identified impacts and determine the significance of each impact;
- ❖ Develop an EMP and MHI with associated mitigation measures; and
- ❖ To evaluate the suitability of the site for the proposed works.

5. PROPOSED APPROACH AND METHODOLOGY

The identification and assessment of environmental impacts during the Scoping phase reveals the following potentially significant environmental aspects which require further detailed assessment. A description of the tasks that will be undertaken as part of the environmental impact assessment process will be undertaken as part of the Technical EIA process as well as Public Participation studies:

- ❖ Air quality impact assessment.
- ❖ Health and safety risk assessment (MHI)
- ❖ Waste Management
- ❖ Surface and groundwater impact assessment.
- ❖ **Services report and storm water management** - The purpose of this study is to determine the impacts associated with the proposed development on the sewer and water system and the required infrastructure needed to service the proposed development. The study will also focus on Storm water releases from the site.
- ❖ Socio-economic impact assessment.
- ❖ Traffic impact assessment.
- ❖ Prepare the Draft EIA Report and Draft EIR.
- ❖ Distribute the Draft EIA Report and Draft EIR for review and comment.
- ❖ Notify registered I&APs of the availability of the Draft EIA Report and Draft S&EIR for review and comment.

- ❖ Undertake consultation with I&APs as required.
- ❖ Prepare a Comments and Responses Table for inclusion in the Final EIA Report.
- ❖ Finalise the EIA Report and S&EIR based on the comments received.
- ❖ Submit the Final EIA Report and S&EIR to GDARD for a decision on the application.
- ❖ Notify registered I&APs of the availability of the final report for review and comment.
- ❖ Notify I&APs of GDARD for decision and the appeal process.

5.1 MHI & Health and Safety Risk Assessment Study

The health and safety risk assessment specialist MHI study will be undertaken by a specialist in conjunction with Dept. of Labour that will include the following

- 1) Review of preliminary designs of proposed processing units, inventories, routing and transport conditions for all alternatives.
- 2) Development of accidental spill and fire scenarios for the facility. Incident scenarios and emission rates will be calculated such as oil, chlorine, hydrogen and hydrochloric acid for both individual and societal risk.
- 3) Using generic failure rate data (for tanks, pumps, valves, flanges, pipework, gantry, couplings and so forth), determination of the probability of each accident scenario.
- 4) For each incident developed in Step 3, determination of consequences (such as thermal radiation, domino effects, toxic-cloud formation and so forth).
- 5) For scenarios with off-site consequences (greater than 1% fatality off-site), calculation of maximum individual risk, taking into account all generic failure rates, initiating events (such as ignition), meteorological conditions and lethality.
- 6) Identification of any shortcomings and ranking of risks for possible risk reduction programmes.

5.2 Air Quality Impact Assessment:

The AQIA specialist study will be undertaken by Batach Holdings specialists and will include the following:

- 1) A detailed analysis of existing air quality monitoring data within the primary area
- 2) Indicate the topographical or meteorological conditions that may hinder the dispersal of air emissions.
- 3) Indicate the measures to be taken to control air emissions if any
- 4) Prepare meteorological data for inclusion in a suitable atmospheric dispersion model.

- 5) Prepare an emissions inventory, using calculated measurements, to include all potential emissions such as:
 - ❖ Chlorine (Cl₂).
 - ❖ Hydrogen chloride (HCl).
 - ❖ Hydrogen (H₂).
 - ❖ Particulate matter (PM).
 - ❖ Sulphur dioxide (SO₂).

- 1) Simulate dispersion of stack emissions and calculate ground level concentrations for various averaging periods, including hourly, daily and annual averages.
- 2) Prepare a comprehensive report to that will include the following:
 - ❖ A summary of all baseline monitoring data.
 - ❖ A list of assumptions and limitations.
 - ❖ Emissions inventory for the primary area if any
 - ❖ Model input parameter description.
 - ❖ Discussion of model results, with specific reference to the motivation for the AEL.
 - ❖ Provide recommendations for monitoring and management /mitigation plans.

5.3 Surface and Groundwater Impact Assessment:

The Hydrology for both the surface and groundwater impact assessment specialist study will be undertaken by J7 Group of specialists and will include the following:

- 1) Review of the existing geotechnical, geohydrological and hydrological information for the site
- 2) Describe the surface and groundwater regime for the proposed plant location.
- 3) Identify and assess potential impacts associated with the construction and operation of the proposed facility in terms of the quantity and quality of surface and groundwater resources, including potential increase in peak surface water flow and potential contamination from oil from heavy machinery.
- 4) Management and mitigation measures, including a Storm water Management Plan and a Water Quality Monitoring Plan for the site.

5.4 Waste Management Assessment Study:

A specialist for Waste Management to determine the waste and undertake the waste management assessment. The assumption that derived from the plant process design is that the waste streams that will be generated by African Chemicals are expected to be small in quantity. These streams will be disposed-off at commercial licensed facilities. The increased waste streams will be accommodated by such facilities if the proposed plant is in operation.

The specialist will undertake amongst other things the following

- 1) WASTE HANDLING AND TRANSPORTATION
 - 1.1 On-site facilities
 - 1.2 Off-site facilities

- 2) ANTICIPATED WASTE STREAMS FOR THE PROPOSED Plant
- 3) WASTE MANAGEMENT PRACTICES
 - 1.1 Solid waste management
 - 1.2 Liquid waste management
 - 1.3 Waste-water management
 - 1.4 WASTE MINIMISATION AND PREVENTION STRATEGIES
- 4) REGULATORY AUTHORISATIONS –
- 5) Waste Management Plan Report

- 6) Recommend practicable mitigation measures to avoid and/ or minimise/ reduce impacts and enhance benefits.

- 7) Register the I&AP's and develop and register

- 8) Address, as required, further social issues raised by stakeholders during the stakeholder engagement (I&AP's) process

5.5 Socio-economic Impact Assessment Study:

The socio-economic impact assessment specialist study will be undertaken by a specialist in Socio-economist and will include the following:

- 1) Define the socio-economic impact study area:
 - Describe the development site.
 - Research factors impacting on the economy of the surrounding area and primary beneficiaries.
- 2) Describe the socio-economic characteristics of the impact area:
 - Profile the demographic and economic characteristics of the area.
 - Review planning and Local Economic Development Frameworks, including spatial Development (LSDF) and economic development plans, as well as planned and proposed development projects.
- 3) Identify and assess the potential significant social and economic impacts associated with the project.
- 4) Recommend practicable mitigation measures to avoid and/ or minimise/ reduce impacts and enhance benefits.
- 5) Register the I&AP's and develop and register
- 6) Address, as required, further social issues raised by stakeholders during the stakeholder engagement (I&AP's) process and Social Impact study

5.6 Traffic Impact Assessment Study:

Even though the preliminary site traffic impact assessment study has been undertaken to determine traffic count. The specialist report will be undertaken by Oarona Consulting Engineers during EIA and will include the following:

- 1) Review available literature including the traffic impact assessment, site visit and identification of data requirements, including the commissioning of a traffic count at the access intersection, observing public transport, road safety and pedestrian flows along the road or roads passing the proposed access intersection (these will be visual assessments).
- 2) Liaise with the project team, local officials and the relevant road authorities if required.
- 3) Identify any existing road infrastructure, road safety or public transport related issues on the road or roads from which access will be taken for this development.

- 4) Assess the traffic likely to be generated by the proposed development during construction and during full operations and analyse the access intersection to establish the geometric layout required based on forecast traffic flows in accordance with the manual.
- 5) Assess whether any site-specific pedestrian, public transport or road safety interventions are required for this development for both construction and full operations.
- 6) Assess the road condition at the access to identify whether any rehabilitation is required by the municipality.
- 7) Liaise with the municipal and road authority officials if need required.
- 8) Prepare a report including layout drawings in the required format.
- 9) Assess the road condition at the access to identify whether any rehabilitation is required by the municipality.
- 10) Liaise with the municipal and road authority officials if need required.
- 11) Prepare a report including layout drawings in the required format.

5.7 SPECIALIST STUDIES

The specialists will outline their proposed methodology and assumptions and sources of information will also be clearly identified. The knowledge of local people should be incorporated in the study. The description of the study approach shall include a short discussion of the appropriateness of the methods used in the specialist study in terms of local and international trends with respect to the specific practice.

5.8 DESCRIPTION OF THE AFFECTED ENVIRONMENT

A description of the affected environment will be provided. The specialist will provide an indication of the sensitivity of the affected environment. Sensitivity, in this context, refers to the “ability” of an affected environment to tolerate disturbance, for example, if disturbance of the natural habitat results in the permanent loss of its biodiversity. The affected environment could be categorised as having a “low tolerance” to disturbance and is, therefore, termed a highly sensitive habitat. If a habitat is able to withstand significant disturbance without a marked impact on its biodiversity, the affected environment could be categorised as having a high tolerance to disturbance (i.e. “low sensitivity” habitat).

6. PUBLIC PARTICIPATION

Particulars of the public participation process that will be conducted during the environmental impact assessment process will be communicated to all the stakeholders.

The extensive database of stakeholders developed during the scoping process will be used as a basis to ensure that those stakeholders involved in the Scoping Phase also participate in the EIA phase. The database will also be expanded to include I&APs that wish to be involved in the process. Registered I&APs will be informed of the availability of the Draft EIA Report for review and will be given 30 days to provide their comment.

The comments received during the 30-day review period of the Draft EIA Report will be incorporated into an updated Comments & Response Report. Further public consultation will take place in the form of Public meetings and focus group meetings as appropriate. The outcome of the proposed PPP will reveal whether or not further public meetings are required. The purpose of the Public Meetings would be to present the findings of the Draft EIA Report and to present the alternative sites to the relevant stakeholders, registered I&APs and the affected landowners. Batach Holdings public participation office will use this forum to provide more background information about the proposed development including the specialist input, and also to provide the stakeholders with the opportunity to further comment on the proposed development.

In the event that the comments reveal information that changes or influences the impact evaluation provided in the Draft EIA, the necessary amendments will be made to the report. The Final EIA Report will be submitted to the relevant Authorities, subsequent to the second phase of public consultation and simultaneously made available for public review

6.1 ADVERTISING

In line with the EIA regulations, the commencement of the EIA process i.e. the Scoping Phase of the project was advertised in a local newspapers in English. The proposed project was announced publicly through the following forms of information sharing:

- ❖ Newspaper adverts providing a description of the proposed development and location, as well as contact details for where more information can be acquired;
- ❖ Notices (with descriptions as above) were placed in and around the vicinity of the proposed development;

- ❖ A2 notices were distributed in the immediate vicinity of the development;
- ❖ Letters were submitted to key stakeholders;
- ❖ BID Documents distributed to local surroundings and Public places.

Advertisements during the detailed assessment phase will follow the same process; however, effort will be made to advertise in other local languages as well. Further advertising will occur during the EIA phase and will relate to the availability of the reports for public review and announcement of public meetings that will be held at strategically located sites, which will allow for maximum attendance.

6.2 INTERACTION WITH GDARD, AND PROVINCIAL DEPARTMENTS AND MUNICIPALITY

Interaction with GDARD and the other Authorities was undertaken during the Scoping Phase and will continue into the EIA Phase of the project. Further interaction will occur in the following manner:

- ❖ Submission of the Final Scoping Report (FSR);
- ❖ A consultation meeting with various stakeholders as appropriate, to discuss the findings of the FSR and the issues identified for consideration in the EIA;
- ❖ Attendance at meetings in consideration of the Covid-19 regulations; and
- ❖ Submission of the Final EIA report, following a public review period.

6.3 DEVELOPING A STRATEGY AND RESOLVING KEY ISSUES

A strategy for addressing and resolving key issues is to be developed and will include:

- ❖ Details on all assessments and investigations carried out;
- ❖ Use of the Public Participation Meetings to present the findings of the reports and test the acceptability of priority issues and mitigations;
- ❖ Openly and honestly relating both positive and negative impacts of the proposed development during the Public Meetings; and
- ❖ Allowing the public to understand the consequences of the proposed development on the area.

6.4 PUBLIC INPUT

Comments and concerns from all stakeholders, interested and affected parties will be gathered, assessed and incorporated into the EIR. Public meetings and information sessions are to be organised where all concerns will be discussed and sound conclusions reached. Upon completion of the draft EIR, the

document is to be put out for public review for a period of 40 days. Further comments received will be addressed and incorporated into the final EIR that will be submitted to the authorities for decision making.

7. IMPACT ASSESSMENT METHODOLOGY

Identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored

The identification of suitable management and mitigation measures will be identified during the EIA and included in the EMPr together with the MHI. The final Environmental Impact Report will be submitted in hard copy and electronic version (CD) and will include the following: The assessment will consider impacts arising from the proposed activities of the project both before and after the implementation of appropriate mitigation measures as follows:-

CRITERIA	DESCRIPTION			
EXTENT	National (4) The whole of South Africa	Regional (3) Provincial and parts of neighboring provinces	Local (2) Within a radius of 2 km of the construction site	Site (1) Within the construction site
DURATION	Permanent (4) Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient	Long-term (3) The impact will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter. The only class of impact which will be non-transitory	Medium-term (2) The impact will last for the period of the construction phase, where after it will be entirely negated	Short-term (1) The impact will either disappear with mitigation or will be mitigated through natural process in a span shorter than the construction phase
INTENSITY/ MAGNITUDE	Very High (4) Natural, cultural and social functions and processes are altered to extent that they permanently cease	High (3) Natural, cultural and social functions and processes are altered to extent that they temporarily cease	Moderate (2) Affected environment is altered, but natural, cultural and social functions and processes continue albeit in a modified way	Low (1) Impact affects the environment in such a way that natural, cultural and social functions and processes are not affected

PROBABILITY OF OCCURRENCE	Definite (4) Impact will certainly occur	Highly Probable (3) Most likely that the impact will occur	Possible (2) The impact may occur	Improbable (1) Likelihood of the impact materialising is very low
----------------------------------	--	--	---	---

Significance is determined through a synthesis of impact characteristics. Significance is also an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The total number of points scored for each impact indicates the level of significance of the impact.

7.1 CRITERIA USED FOR THE RATING OF IMPACTS

TABLE 6:2: CRITERIA FOR THE RATING OF CLASSIFIED IMPACTS

Low impact (4 -6 points)	A low impact has no permanent impact of significance. Mitigation measures are feasible and are readily instituted as part of a standing design, construction or operating procedure.
Medium impact (7 -9 points)	Mitigation is possible with additional design and construction inputs.
High impact (10 -12 points)	The design of the site may be affected. Mitigation and possible remediation are needed during the construction and/or operational phases. The effects of the impact may affect the broader environment.
Very high impact (13 - 20 points)	Permanent and important impacts. The design of the site may be affected. Intensive remediation is needed during construction and/or operational phases. Any activity which results in a “very high impact” is likely to be a fatal flaw
Status	Denotes the perceived effect of the impact on the affected area.
Positive (+)	Beneficial impact.
Negative (-)	Deleterious or adverse impact.
Neutral (/)	Impact is neither beneficial nor adverse.
It is important to note that the status of an impact is assigned based on the status quo – i.e. should the project not proceed. Therefore not all negative impacts are equally significant.	

The suitability and feasibility of all proposed mitigation measures is included in the assessment of significant impacts. This was achieved through the comparison of the significance of the impact before and after the proposed mitigation measure is implemented. Mitigation measures identified as necessary will be included in an EMP.

7.2 Status of Impact

The impacts are assessed as either having negative effect (i.e. at a 'cost' to the environment), Or positive effect (i.e. a 'benefit' to the environment), or Neutral effect on the environment.

7.3 Extent of the Impact

- (1) Site (site only),
- (2) Local (site boundary and immediate surroundings),
- (3) Regional (within the City of Johannesburg),
- (4) National,

7.4 Duration of the Impact

The length that the impact will last for is described as either:

- (1) Short term (1-5 years),
- (2) Medium term (5-15 years),
- (3) Long term (ceases after the operational life span of the project),
- (4) Permanent.

7.5 Magnitude of the Impact

The intensity or severity of the impacts is indicated as either:

- (1) Low,
- (2) Moderate (environmental functions altered but continue),
- (3) High (environmental functions temporarily cease), or
- (4) Very high / Unsure (environmental functions permanently cease).

7.6 Probability of Occurrence

The likelihood of the impact actually occurring is indicated as either:

- (1) Improbable (unlikely to occur),
- (2) Possible (probability very low due to design or experience)
- (3) Highly Probable (distinct probability that the impact will occur),
- (4) Definite. (most likely to occur), or

7.7 Significance of the Impact

Based on the information contained in the points above, the potential impacts are assigned a significance rating (S). This rating is formulated by adding the sum of the numbers assigned to extent (E), duration (D) and magnitude (M) and multiplying this sum by the probability (P) of the Occurrence.

$$S = (E+D+M) P$$

The significance ratings are given below

- ❖ **(<6)** low (i.e. where this impact would not have a direct influence on the decision to develop in the area),
- ❖ **(7-9)** medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- ❖ **(10-12)** high (i.e. where the impact must have an influence on the decision process to develop in the area).
- ❖ **(13-20)** Very High Impact - Permanent and important impacts. The design of the site may be affected

7.8 IMPACT IDENTIFICATION AND ASSESSMENT

The specialist will make a clear statement, identifying the environmental impacts of the construction, operation and management of the proposed development. As far as possible, the specialist must classify the potential environmental impacts identified in the study and assess the significance of the impacts according to the criteria set out above. Each impact will be assessed and rated as per the methodology described. The impact assessment will provide an evaluation of the significance of each of the three phases of the project (i.e. design, construction and operational and decommissioning and closure phases). The assessment of the data must, where possible be based on accepted scientific techniques, failing which the specialist must make informed judgements based on his/her professional expertise and experience.

Preliminary specialist studies have been conducted, however, detailed specialist investigations and quantification of impacts identifies are yet to be conducted. The findings of each field of study will be presented to stakeholders as well as Interested and Affected Parties. Further studies and assessments in the following areas of specialization will be conducted (in addition to any studies required by the authorities):

7.9 MITIGATION AND PREVENTION MEASURES

Feasible, practical mitigation, impact prevention and project optimisation measures would be recommended in order to minimise negative impacts and to enhance the benefits of positive impacts.

The mitigation measures should further address the following:

- ❖ Mitigation objectives- Level of mitigation being targeted

For each identified impact, the specialists will provide mitigation objectives, which would result in a measurable reduction of the impact. Where limited knowledge or expertise exists on such mitigation, the specialists must consult with other specialists on the team failing which the specialists must make a judgement call based on his/her professional experience.

- ❖ Recommended mitigation measures

For each impact the specialist must recommend practicable mitigation actions that can measurably affect the significance rating. The specialist must also identify management actions, which could enhance the

condition of the environment. Where no mitigation is considered feasible, this must be stated and reasons provided.

❖ Effectiveness of mitigation measures

The specialist must provide quantifiable standards (performance criteria) for reviewing or tracking the effectiveness of the proposed mitigation actions, where possible, as this will be utilised when drafting the monitoring component of the EMPr.

❖ Recommended monitoring and evaluation programme and MHI

The specialist is required to recommend an appropriate monitoring and auditing programme, which would be able to track the efficacy of the mitigation objectives. Each environmental impact will be assessed before and after mitigation measures are implemented in order to show how effective or ineffective will be. The management objectives, design standards etc., which, if achieved, can eliminate, minimise or enhance potential impacts or benefits must, wherever possible, be expressed as measurable targets. National standards or criteria are examples, which can be stated as mitigation objectives.

Once the above objectives are stated, feasible management actions, which can be applied as mitigation, must be provided. A duplicate column in the impact assessment tables should indicate how the application of the proposed mitigation or management actions has reduced the impact. If the proposed mitigation is of any consequence, it should result in a measurable reduction in impacts (or, where relevant, a measurable benefit).

8. METHODS OF IDENTIFYING ALTERNATIVES

The identification of alternatives is an important component of the EIA process. The various alternatives have been identified and will be assessed in terms of both environmental acceptability as well as economic feasibility during the EIA phase of the project. The preferred option will be highlighted and presented to the authorities. As with the majority of developments, finding alternative sites and design methods is a requirement. It is important to note that identification of alternatives during the Scoping have taken the following forms:

- ❖ Site alternative;
- ❖ Design alternative;
- ❖ Planning alternative; and
- ❖ No-go alternative.

Site and design alternatives have been identified and will be further assessed against the No Go Alternative in the EIA phase. In addition, the potential environmental impacts associated with the proposed Proposed Construction and Operation of the Caustic Soda Make-Up Plant will be investigated and evaluated in further detail within the EIA phase of the study.

8.1 PROJECT ALTERNATIVES

In terms of the EIA Regulations, feasible alternatives are required to be considered as part of the environmental investigations. An alternative in relation to a proposed activity refers to the different means of meeting the general purpose and requirements of the activity. Item 2(1) (g) in Appendix 2 of GN 326 stipulates that the Scoping Report must provide a full description of the process followed to reach the preferred activity, site and location of the development footprint within the site. This chapter meets the requirements of Items 2.(1)(g)(i) and 2.(1)(g)(x), by providing details of all the alternatives considered and a motivation where alternatives were not considered.

The following alternatives are discussed in the sub-sections below:

- ❖ The property on which or **Location** where it is proposed to undertake the activity;
- ❖ The type of activity to be undertaken and **Technology**
- ❖ The design or **Layout** of the activity;
- ❖ The **No-go** aspects

All identified feasible alternatives are required to be evaluated in terms of social, biophysical, economic and technical factors.

8.2 TECHNOLOGY

African Chemicals supplies caustic soda in solid flake as well as in lye form. The caustic flakes and water in the Caustic Dissolution Tank are mixed by the Caustic Dissolution Tank Agitator, to ensure homogenous dissolution. The caustic flakes dissolution is exothermic, causing heat generation during dissolution. The Caustic Dissolution Tank Fan draws out the hot water vapours that form in the Caustic Dissolution Tank due to the heat of dissolution. Removing the water vapour which allows dry air to be pulled through the Caustic Metering Screw Feeder opening. This prevents the caustic solids in the Caustic Metering Screw Feeder from getting wet, preventing blockages. The excess heat is removed by circulating the liquid caustic solution (caustic lye) through an external plate heat exchanger, the Caustic Dissolution Cooler, to maintain a temperature in the Caustic Dissolution Tank of 120 °C. ‘

8.3 LOCATION

The site location was selected based on the following factors:

- ❖ Proximity to similar chemical producing industries
- ❖ Proximity to the OR Tambo and other logistic such as N1/N3 corridors
- ❖ Allows for lower logistics costs when transporting raw materials to site.
- ❖ Allows access to other provinces shipping and international shipping routes for product export.
- ❖ Product demand in Gauteng and surrounding such Mpumalanga and North West
- ❖ Allows AC to service markets more cost-effectively than producers in the other areas
- ❖ Benefits associated with being situated within an Industrial zone
- ❖ Any other vacant land nearby and alternatives were considered

8.4 SITE LAYOUT ALTERNATIVE

Alternative site layouts were considered in terms of a preliminary risk and logistics assessment as part of the scoping / feasibility study. Two layout alternatives will be further investigated and assessed within the Environmental Impact Assessment. The health and safety risk assessment (MHI) which is ongoing as a specialist study will in the next phase of the EIA process be undertaken. The modelling to consider the risk levels with respect to processes such as liquefaction and caustic & lye storage and recommendations

from the study may result in further amendments to the layout to mitigate potential risks to an acceptable level.

8.5 NO-GO ALTERNATIVE

The no-go alternative implies the continuation of the status quo in terms of development potential, zoning and management. In the case of the AC site, this would mean leaving the land as is i.e. vacant. However, the site has been zoned for industrial use (INDUSTRIAL Type I), and is in line with the Local SDF. The site is extensively disturbed and is partially transformed and without any environmental sensitivity. It seems likely that industrial development would have taken place on the site at some stage in the future

The site is not a sensitive area from an environmental resources point of view. Potential negative risks and impacts associated with the proposed development would not apply in a no-go situation. The potentially highly significant positive socio-economic impacts would also not be realised if the area is not developed. . By not developing the site, the site will be anomalous in the context of the surrounding urban land uses, and some of the direct and indirect socio-economic benefits (i.e. job creation will not materialize

The benefits associated with the development currently outweigh the potential negative impact associated with the project. As such, the no go alternative is not preferred by the EAP. The “no-go” alternative is therefore not considered the preferred alternative.

All the different preferred alternatives will be used to determine the final layout of the proposed development so that it has the least environmental impact on the environment.

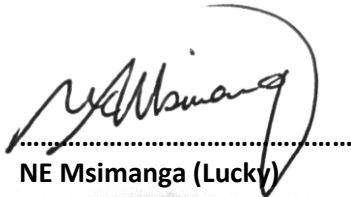
8.6 COLLATING AVAILABLE INFORMATION AND IDENTIFYING KNOWLEDGE GAPS

Site specific data will be gathered through detailed site investigations. Information on any previous studies in the area will be collated and all available information evaluated to determine gaps in the data. The following methodology above will be used to acquire completed specialists reports (previous studies) and site-specific information to assist in the compilation of the Environmental Impact Report.

9. CONCLUSION

Batach Holdings recommends that the proposed project proceed to the EIA phase. Batach Holdings will ensure that the EIA phase of the project complies with the Regulation as comprehensive as possible. Furthermore, recommends that this Plan of Study (Chapter 15) be accepted, with or without conditions, and that the applicant be allowed to continue with the tasks contemplated in the Plan of Study. Batach Holdings will ensure their independence throughout the project.

Batach Holdings (Pty) Ltd

A handwritten signature in black ink, appearing to read 'NE Msimanga', is written over a horizontal dotted line. The signature is fluid and cursive.

NE Msimanga (Lucky)
Lead: Environmental Assessment Practitioner