Specialist Studies

- Traffic
  - Site inspection
  - Visual assessment of existing conditions
  - Sample traffic counts at selected intersections
  - Forecast future traffic conditions
  - Management measures to mitigate potential impacts

Synergistics Working Together

DISCUSSION AND QUESTIONS

Synergistics Working Together

Public Participation

- Public consultation process involves:
  - Notifying IAPs of the project
  - Provide opportunity for IAPs to comment
  - Maintain a register of IAPs and comments
  - Provide an opportunity for IAPs to review and comment on all reports;
  - Comments must be included in reports submitted to authorities

Synergistics Working Together

CONTACTS

ENVIRONMENTAL CONSULTANTS:

Synergistics Environmental Services:

Mari Wolmarans and Vivienne Vorster

Tel: 011 807 8225 Fax: 011 807 8226

PO Box 1822, Rivonia, 2128

Email: vivienne@synergistics.co.za

Synergistics Working Together

Way Forward

- Written comments from IAPs
- Scoping Report(s) for public review
- Draft IWULA Amendment Report for public review
- Submission of Scoping Report(s) and Draft IWULA Report to authorities
- Engineering designs to be completed
- Specialist studies to be completed
- IAPs to review final reports before submission
- Final EIA, EMP, IWULA, Atmospheric Emissions License and Waste Management License submission to authorities for approval

Synergistics Working Together

11 August 2010

PRESENTATION ENVIRONMENTAL:
PUBLIC INFORMATION AND PARTICIPATION MEETING
SINTEL CHAR EXPANSION

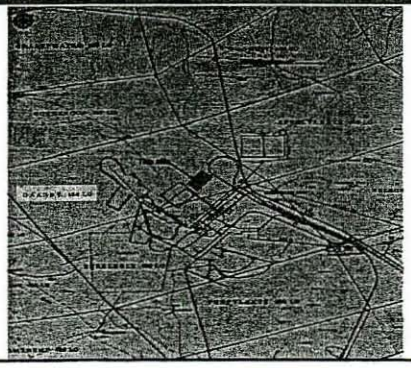
exxaro
POWERING POSSIBILITY

CONTENTS

- Char Plant Location
- Reductants
- Char Market & Logistics
- Char Plant Description & Layout
- Char Plant Expansion

SINTEL CHAR PLANT SITE

PLANT POSITION



REDUCTANTS

REDUCTANTS

- Used in the metals industry to reduce oxygen from ore to produce the basic metal
- Carbon is the essential component of a reductant
- Exxaro entered reductants market with existing char plant targeting the Ferrochrome (FeCr) market
- Reductants in use in FeCr industry is a blend of:
  - Coke
  - Char
  - Cosi
- Good quality char can replace imported coke to some extent

MARKET: Ferrochrome

- Ferrochrome - main constituent in Stainless Steel production
- Ferrochrome vs Chrome ore export = benefit to SA economy
- Exxaro Char clients:
  - HERNIC - RUSTENBURG
  - ASSMANG - MACHADODORP
  - ASA METALS - BURGERSFORT
- Char transported by road to clients
  - Limited rail capacity from Lephalale
  - No rail facilities available close to clients

CHAR PRODUCT OVERVIEW

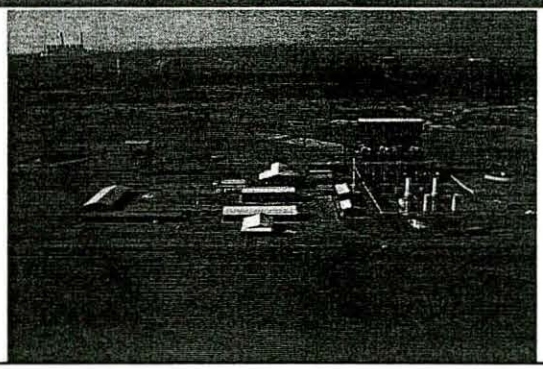
6

- What is Char?
  - Char is formed when coal is devolitised at temperature in the absence of oxygen
- Comparison between coal and char:

	COAL	CHAR
Fixed carbon	62.3%	84.2%
Ash	12.5%	14.4%
Volatiles	24.1%	1.3%

CHAR PLANT

9



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CHAR PLANT – AS BUILT

CHAR PLANT - CURRENT

10

- 140 ktpa Char production capacity
- 4 Retort units commissioned between June and November 2009
- Plant units:
  - Coal stockpile with plant feed conveyors
  - Product stockpile and handling area
  - Retorts with gas cleaning and cooling section
  - Tar storage and truck loading facility
  - Liquor destructor area with storage vessels
  - Excess gas flares
  - Utilities – Steam, Compressed Air, Diesel and LPG
  - Bunded areas for process and storage vessels
  - Pollution control dam
  - Buildings

CHAR PLANT LAYOUT - 2007

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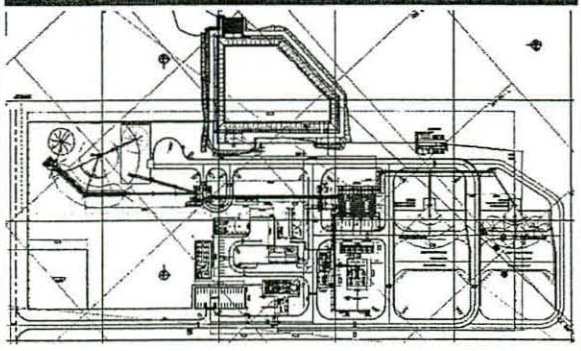


SINTEL CHAR PLANT PROCESS

11

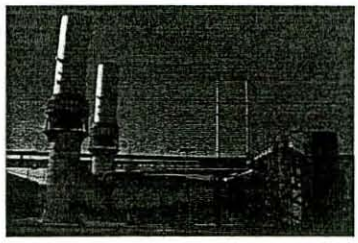
- CHAR PLANT
  - CHARACTERISTICS OF THE PROCESS
    - Feedstock is washed, sized and free of fines limiting the potential for coal dust generation.
    - Char process takes place in closed circuit
    - Involves the recycling of gaseous heat in the absence of oxygen which maximizes recovery of lumpy carbon
    - Gas from the retort system is passed through electrostatic precipitators, which removes tars and light oils from the gas
    - Water condensate (liquor) from the cooling systems and gas booster fans are disposed of through a liquor destructor that burns of the contaminants

SINTEL CHAR PLANT PROCESS (cont.)

- CHARACTERISTICS OF THE PROCESS (Cont.)
  - Char product and tar is transported to the various clients by road transport
  - Raw, potable and process water is supplied from the mine through a dedicated supply
  - Process water is used to quench the Char Product leaving the retort.
- RUN-OF-MINE FEEDSTOCK
  - Coal is washed, crushed and screened at the mine
  - Coal is then transported via overland conveyor and stockpiled at the CHAR PLANT Site.

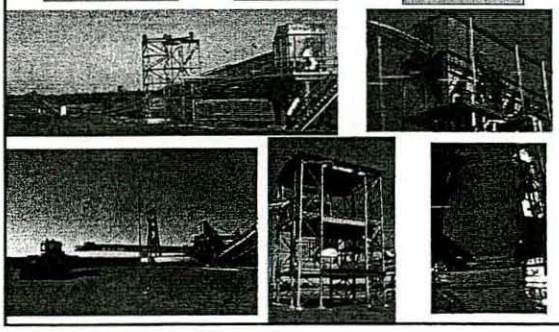
Waste liquor handling:

Waste liquor destruction ← Waste liquor storage



Coal handling & transportation:

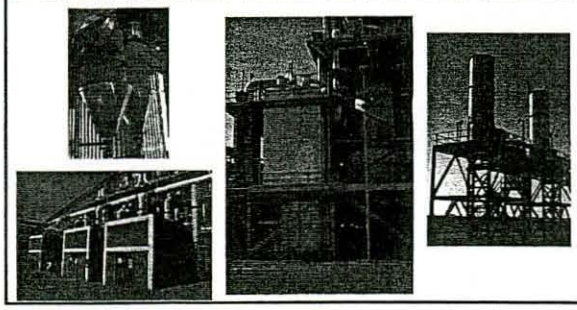
Coal transported on overland conveyor to char plant → Coal stockpile → Coal handling system



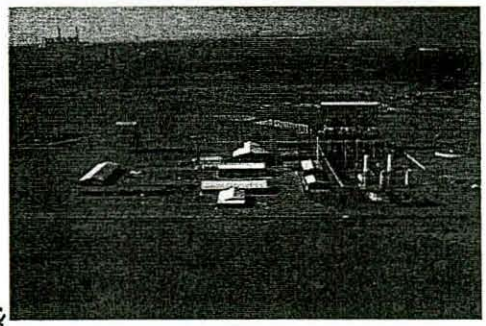
CHAR PLANT EXPANSION

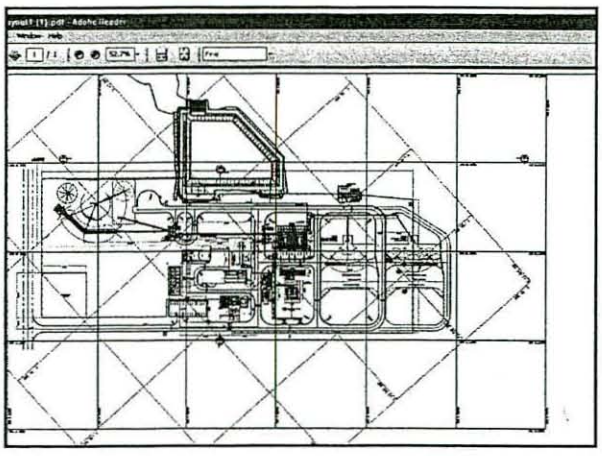
Gas handling system:

Cyclone → Electrostatic precipitators → Gas coolers → Gas booster → Flare



CHAR PLANT





PROCESS FLOW DIAGRAM

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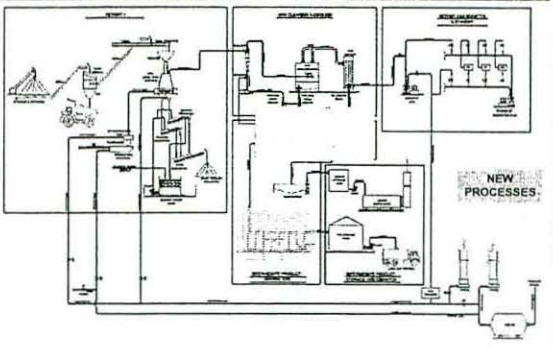
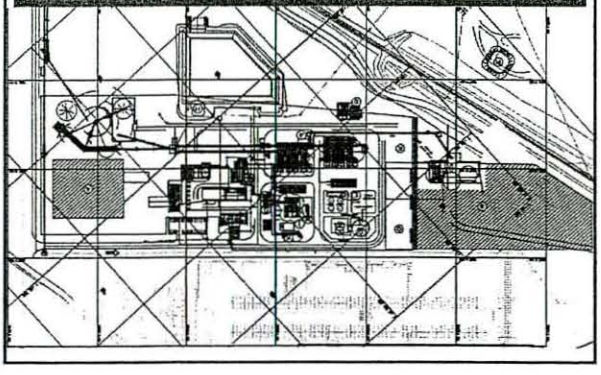


CHAR 2 PLANT LAYOUT

19



WATER BALANCES

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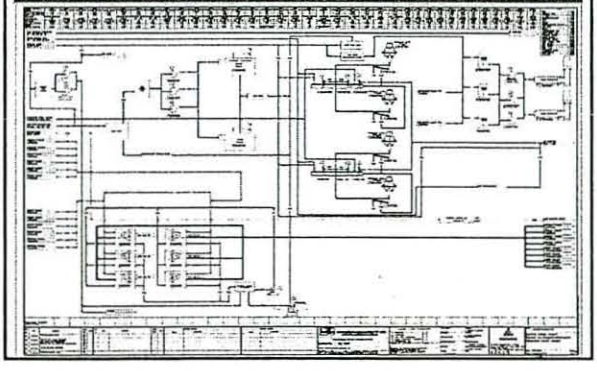

CHAR EXPANSION

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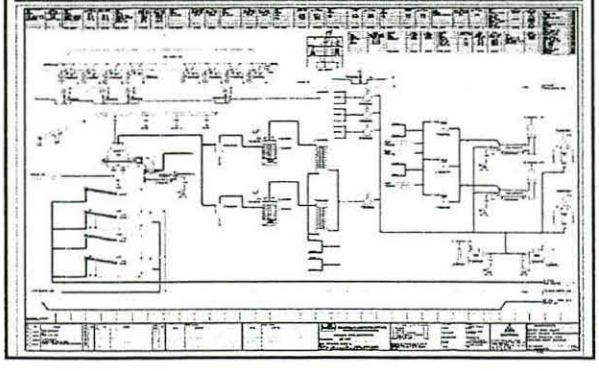
- 4 Additional retorts to be constructed next to original 4 Retort units
- Char retort and gas circulation process layout to be duplicated
- Increase gas reticulation system and excess gas flare capacity
- Construct new product stockpile area with in-line screening
- Construct new Tar storage and truck loading facility
- Install additional liquor destructor capacity and liquor
- Construct a tar sludge (coal fines and tar mixture) handling area
- Construct a tar sludge storage and reclamation facility
- Increase size of coal feed stockpile with automated coal loading
- Increase area of non-process buildings
- Processes being investigated
  - Briquetting of char and coal fines
  - Utilisation of excess process gas

GAS FLOW

23



ENVIRONMENTAL QUANTIFICATION

APPROXIMATE EMISSION COMPARISON: kg/h

ITEM	DIESEL CAR	HAUL TRUCK	BOILER	RETORT
SOx	0.25	3.8	260	84
H-C	1.8	27	900	15
H-C #(Aromatic)	4.5	65	320	12
CO_2	3.5	54	1300	258
NOx	8	65	550	83
Particulate matter	0	0.1	150	3
H_2O	1.5	15	350	480
TOTAL OFF-GAS kg/h (Excluding H_2O, O_2 and N_2)	18	215	3830	455

One Retort = 2.1 Haul Trucks' emission = 8.5 Bakkies' emission ; Retort/Boiler = 1/33

Process: Slow, Low temp, Low Oxygen versus Fast, High temp, Abundance of Oxygen

XX

MEETING: Since our Expansion — Public Meeting.

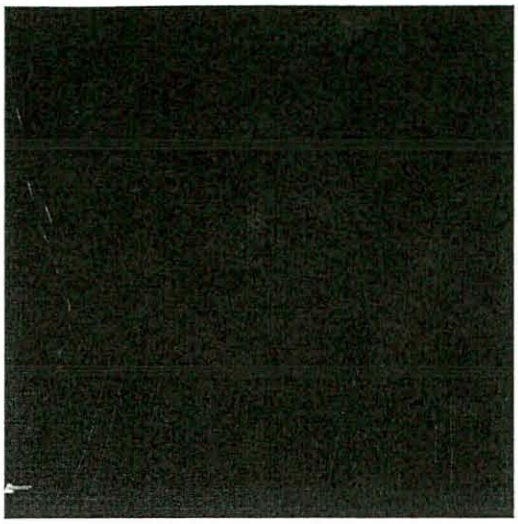
DATE: 11 Aug 2010

ATTENDANCE REGISTER

NAME	SURNAME	ORGANISATION	TEL	FAX	CELLPHONE	E-MAIL	POSTAL ADDRESS AND PHYSICAL ADDRESS
✓ Floriaine	Swanepoel	Exxaro Grooregeluk	014 763 9288		083 662 1104	Floriaine.Swanepoel@exxaro.com.	Grooregeluk Mine
✓ Experience	Nkwamba	Exxaro	014 763 9646		083 701 2995	experience.nkwamba@exxaro.com	Grooregeluk Mine
Tendani	Mufamadi	EXXARO	0147639650		083541 4348	tendani.mufamadi@exxaro.com	GG
✓ Johannes	molepo	FERROLAND	0147682285		072269 6334	Johannes.Molepo@exxaro.com	Marloothi Game Reserve
Edwin.					071 851 1378 079 953 6020		
Guillaume	de Swardt	XX	012 3073161	012 3073710	083 609 1525	guillaume.de Swardt@exxaro.com	XX Technology.

March 2011

CHAR, COKE AND CO-GEN PROJECTS



GROOTEGELUK MINE PUBLIC MEETING
17 MARCH 2011

GROOTEGELUKMYN
OPENBAREINLIGTINGSVERGARDERING
17 MAART 2011

Time/Tyd: 17H00 – 19H00

Venue/Plek: Mogol Club

AGENDA/SAKELYS

1. WELCOME/ VERWELKOMING

2. INTRODUCTION &PURPOSE OF THE MEETING/ INLEIDING EN DOEL VAN DIE VERGADERING

3. PROJECT OVERVIEW/ OORSIG OOR DIE PROJEK
   - 3.1 Project Motivation/ Motivering van die projek
   - 3.2 Project Description/ Beskrywing van die projek

4. ENVIRONMENTAL LEGISLATIVE PROCESSES/ OMGEWINGSWET VEREISTES
   - 4.1 Environmental Reports/ OmgewingsDokumente
   - 4.2 Specialist Studies/ Spesialisverslae
   - 4.3 Public Consultation Process/ PubliekeKonsultasie Proses

5. QUESTIONS AND DISCUSSION/ VRAE EN BESPREKING

6. WAY FORWARD/ DIE PAD VORENTOE

7. CONCLUSION/ AFSLUITING

GROOTEGELUK MINE CHAR, COKE AND CO-GEN PROJECTS/PROJEKTE

PUBLIC MEETING 17 MARCH 2011/ OPENBARE VERGARDERING 17 MAART 2011

ATTENDANCE REGISTER/ BYWONINGS REGISTER

NAME/NAAM	AFFILIATION / FARM BETROKKENHEID/PLAASNAAM	TEL	FAX/FAKS	E-MAIL/E-POS	POSTAL ADDRESS/ POS ADRES
Shelley Holt	Synergistics	0118078225	0118078226	shelley@synergistics.co.za	Box 1822, Rivonia, 2128
GERT JANSEN VAN RENSBURG	EXXARO HQP	012 3074742 083460 7116.		Gert.JansenvanRensburg@exxaro.com	
Edwynn Louw	Synergistics	0118078225	0118178226	edwynn@synergistics.co.za	Box 1822, Rivonia 2128.
GUILLAUME DE SWARDT	EXXARO	012 3073161	012 307 3070	guillaume.deswardt@exxaro.com	
JACOVDyk	EXXARO	0836571027	0123073864	jacovdyk@exxaro.com	
Lomeus Conradie	EXXARO	083609 4292	086 219 6250	Lomeus.conradie@exxaro.com	
John Viljoen	Eeducants	0833047223	012 3075147	john.viljoen@exxaro.com	Impala 18 Onverwacht.
TENDANI MUFAMADI	EXXARO	083 546 4348	014 763 9650	tendani.mufamadi@exxaro.com	BOX 5055 Onverwacht 0557
ELIJAH MABOGO	CORE SKILLS ACADEMY	0782330967		WestCoast.mabogo@Gmail.com	BOX 5055 onverwacht 0557

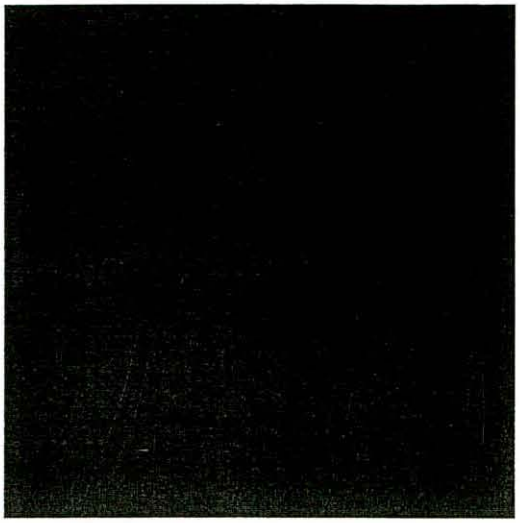
GROOTEGELUK MINE CHAR, COKE AND CO-GEN PROJECTS/PROJEKTE

PUBLIC MEETING 17 MARCH 2011/ OPENBARE VERGARDERING 17 MAART 2011

ATTENDANCE REGISTER/ BYWONINGS REGISTER

NAME/NAAM	AFFILIATION / FARM BETROKKENHEID/PLAASNAAM	TEL	FAX/FAKS	E-MAIL/E-POS	POSTAL ADDRESS/ POS ADRES
GODFREY MULELU	CORE SKILLS ACADEMY	0762492790		mulelumg@gmail.com	PO Box 5055 ONVERWACHT 0557
CHARLES LINSTRÖM	EXXARO	0123074100		charles.linstrom @ exxaro.com	PO BOX 9229 PRETORIA
LA Magbane	Green Hills	0733074899		greenelect@gmail.com	P.O. Box 6545 Onverwacht 0557
Gilead Mhegla	EXXARO	0147639868		GILEAD.MTEGHA@EXXARO.COM	P.O. BOX 102648 MORELETA PLAZA 0167 PTA
J Schoeman	EXXARO.	0836010190		johan.schoeman @ exxaro.com	P_B_ 5344 ONVERWACHT 0557

MINUTES OF MEETING



Project: **Exxaro Projects: Grootegeluk Char Plant Expansion, and Coke and Co-gen Plant**

Meeting: **Public Meeting**

Date, time & Venue: 17 March, 2011, 17h00
Mogol Club

Compiled by: Edwynn Louw and Shelley Holt
Synergistics Environmental Services

ATTENDANCE:

Name	Telephone	Email
Edwynn Louw	0118078225	edwynn@synergistics.co.za
Shelley Holt (SH)	0118078225	shelley@synergistics.co.za
G. Jansen van Rensburg (GR)	0123074742	gert.jansenvanrensburg@exxaro.com
G. de Swart (GS)	0123073161	guillaume.deswart@exxaro.com
Jaco van Dyk	0836091029	jaco.vandyk@exxaro.com
Lomeus Konradie (LK)	0836094292	lomeus.conradie@exxaro.com
Johan Viljoen	0833047223	johan.viljoen@exxaro.com
Tendani Mufamadi (TM)	0835464348	tendani.mufamadi@exxaro.com
Elijah Mabogo (EM)	0782330967	westcoast.mabogo@gmail.com
Godfrey Mulelu	0762492790	mulelumg@gmail.com
Charles Linstrom (CL)	0123074100	charles.linstrom@exxaro.com
L.A. Maabane	0733074899	greenelect@gmail.com
Gilead Mtegha	0147639868	gilead.mtegha@exxaro.com
J. Schoeman	0836090190	Johan.schoeman@exxaro.com

APOLOGIES:

Mari Wolmarans

MINUTES OF MEETING:

Welcome, Introduction and Project Presentations:

Shelley Holt from Synergistics (SH) opened the meeting and indicated that the purpose was to:

- Discuss the proposed expansion of the Char Plant and construction of the Coke and Co-gen Plants; and
- To inform the public about the proposed projects and to take note of any comments, queries and question which they may have.

SH gave a brief description of the Char Plant expansion project, and Coke and Co-gen Plants (Refer to the attached PowerPoint presentation). She then handed over to Guillaume de Swart of Exxaro (GS) and Gert Jansen van Rensburg (GR) to give an overview of the technical processes involved.

GS gave a detailed explanation of the proposed Char Plant expansion project. He also discussed the Char Plant process, inputs, outputs and infrastructure involved in detail. GR explained the details of the Coke and Co-gen Plants. (Refer to the attached PowerPoint presentations)

SH continued the presentation outlining the environmental authorisation and legislation requirements, the specialist studies to be undertaken as well as the purpose and function of the public participation process.

Questions and Comments:

Question/Issue Raised:	Answer:
Tendani Mufamadi of the Grootegeluk Mine (TM): Are you going to extend the capacity of the pollution control dam?	GS: Yes we are. Charles Linstrom of Exxaro (CL): It is currently under investigation by Jones and Wagener (surface water specialists). We will update the public on the results of the specialists' studies.
Elijah Mabogo (EM): How long will construction of the plant take?	Lomeus Konradie of Exxaro (LK): We use special materials, and thus it can take two years, up to the end of 2014.
TM: Will you need a permit for emissions and electricity generation from the Department of Energy?	SH: We are applying for an Atmospheric Emissions License. With regard to the Department of Energy, I don't think a permit is needed, but we will confirm it.
TM: With regard to water use licenses required, a Section 21 A license is missing. Are you making provision for it?	CL: No, section 21 A applies to the Mokolo and Crocodile Water Augmentation Project (MCWAP). We already have an allocation from MCWAP for the Grootegeluk Mine. We will use the allocated water for the Char, Coke and Co-gen Plants as well.

There were no further questions and the meeting was closed at 18:30pm. The attendees were thanks for their attendance.

Please see the full presentations attached herewith.

17 MARCH 2011

CHAR & MARKET COKE ENERGY RECOVERY PLANTS

EIA Public Participation Presentation

Sachin Thakurpersad / Gert Jansen van Rensburg

exxaro

POWERING POSSIBILITY

Objectives

1

To provide:

- A rationale for electricity generation by effective usage of waste heat and discard materials;
- Ensuring compliance to Environmental protection legislation requirements by using modern process technology;
- An overview of the Market Coke Co-generation plant;
- An overview of the Char Energy Recovery plant;
- Coke Process Video Clip

Introduction

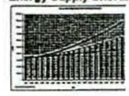
2

- Char plant Produces the following Streams:
  - Tar
  - Liquor
  - Off Gas
  - Char
- Coke Ovens Produce
  - Waste Heat/Hot gas
  - Coke product
- The Waste Heat/Off-gas energy can be used for electricity generation;
- The aim is to build a plant to generate
  - 70 MW of electricity from Coke Oven Flue Gas (COFG) produced by Coke Plant using Waste Heat Recovery Boiler (WHRB) technology
  - 60 MW of Electricity from the Streams from the Char Plant with supplement of Discard Coal using Circulating Fluidized Bed (CFB) Boiler technology

Why Electricity Generation?

3

Energy Supply Shortage



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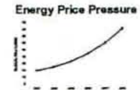
Energy Price Pressure



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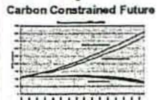
Carbon Constrained Future



exxaro

Business Response:

Prepare for a Low-Carbon, Energy Constrained Future with Sustainability

Impacts on Business

Negative impacts on

Business: New and

Existing

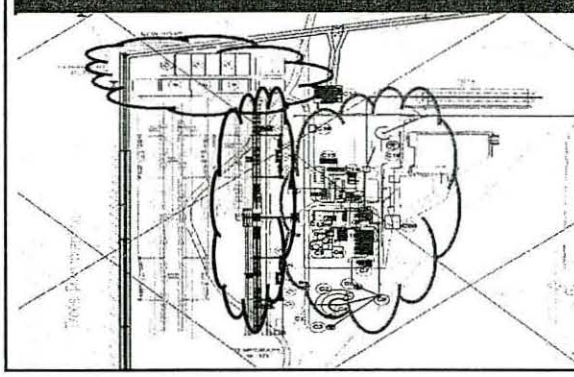
No new Developments

What Does it mean for Exxaro and its Stakeholders

- Improving energy efficiency-More Electricity for Communities
- Designing for efficiency
- Carbon offsets-Greener Economy
- Lower harmful emissions into atmosphere.
- Cleaner processes

Site Layout/Location

4



Char Co-Generation Plant

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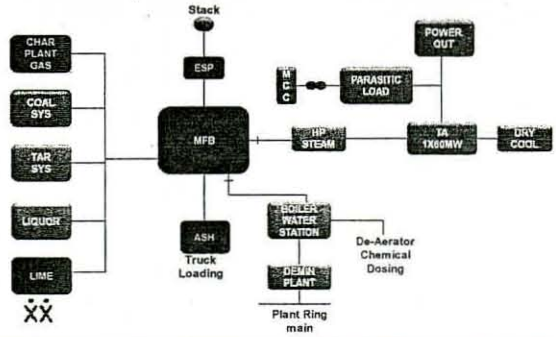

Emission Levels Comparison

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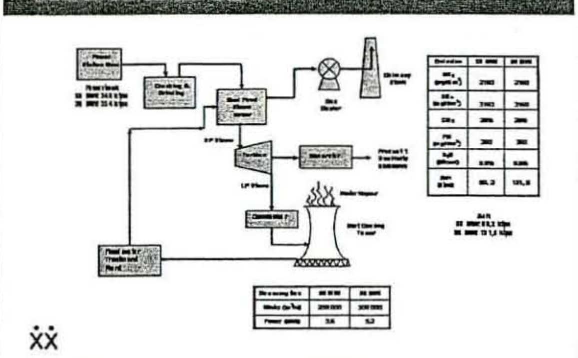
Emissions, Power, Or Product	Coal Fired Power Plant 240 ktpa	Coke Plant Without Co-gen 240 ktpa	Coke and Energy Plant 750 ktpa	Integrated Coke, Char and Energy 750 & 735 ktpa	SANS Specification	Air Quality Act - March 2010 (Sec 10 - 1.4) Char CFB	Air Quality Act - March 2010 (Sec. 10 - 1.4) (Sec. 12-3) Coke WHRB
SO_2 (mg/Nm^3)	2180	460	345	260	350	500 (existing)	400 (new)
NO_x (mg/Nm^3)	3180	528	390	240	200	300 (existing)	700 (new)
CO_2 (%)	25	7,3	5,5	6,3	n/a	Unspecified	Unspecified
PM (mg/Nm^3)	380	84	60	48	75 (daily)	10	50 (new)
H_2S (mg/Nm^3)	High	0	0	0	n/a	Unspecified	[illegible]
PAH, VOC (mg/ Nm^3)		tbd	tbd	tbd		0.5 (Expensive Measuring Eq.)	Not listed
Power	60 MW	(20 MW waste heat)	60 MW	70 MW & 60 MW			
XX Product		132 ktpa	450 ktpa	450 & 515 ktpa			

FOR COMPARISON PURPOSES ONLY Coal fired power station

7



Coke Plant without Co-gen

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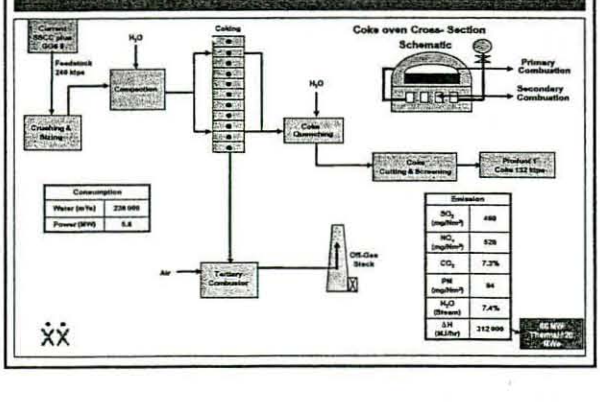

Coke Plant with Co-gen

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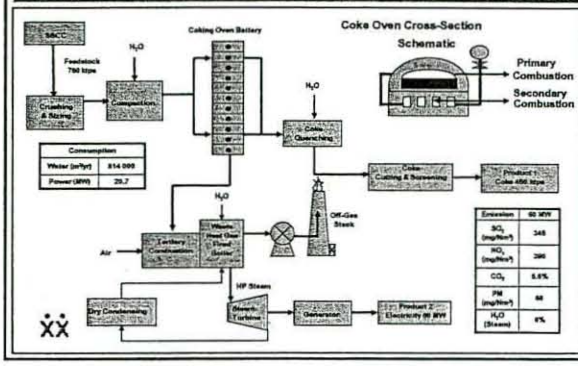

Integrated Coke, Char and Co-gen

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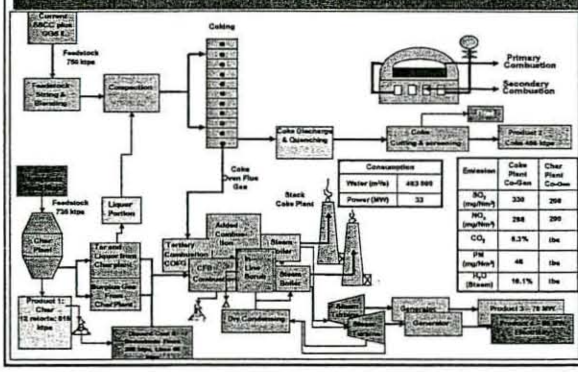
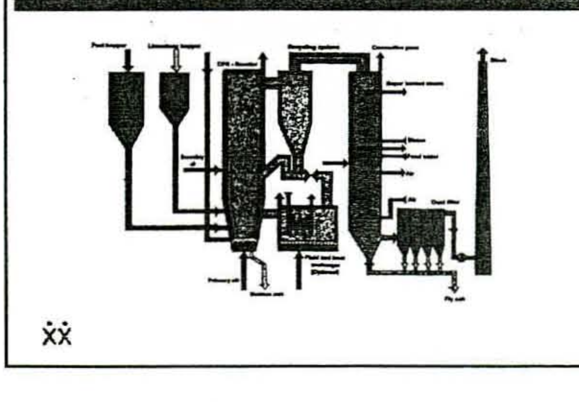


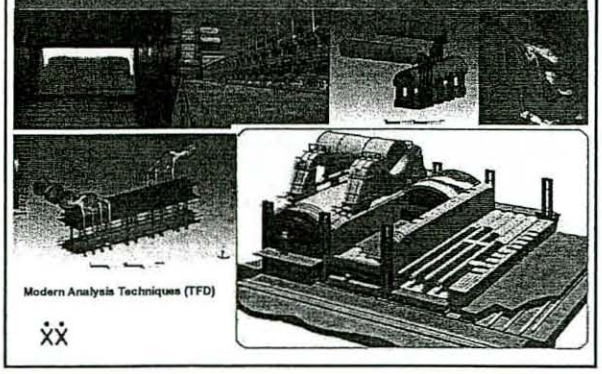
Circulating Fluidized Bed (CFB) Boiler

11



Coke Process and Plant Examples

12



Modern Analysis Techniques (TFD)

Questions

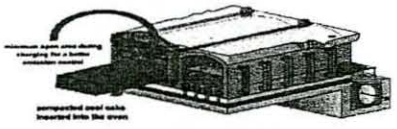
15

?

Emission Reduction Features

13

Increase of Coke Quality and Reduction of Emissions by Stamp Charging at Heat Recovery Ovens



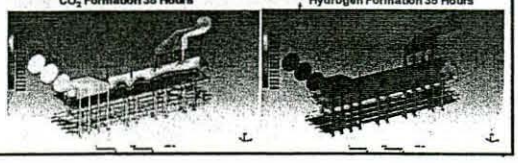
- Modern Design Technology – Negative Pressure process
- Complete Combustion, sufficient Air addition before WHRB entry
- Tertiary or Quaternary Combustion (if required)

Flow and Constituents Modelling

14

CO_2 Formation 35 Hours

Hydrogen Formation 35 Hours



17 March 2011

PRESENTATION ENVIRONMENTAL:
PUBLIC INFORMATION AND PARTICIPATION MEETING
CHAR PLANT EXPANSION

exxaro
POWERING POSSIBILITY

REDUCTANTS

CONTENTS

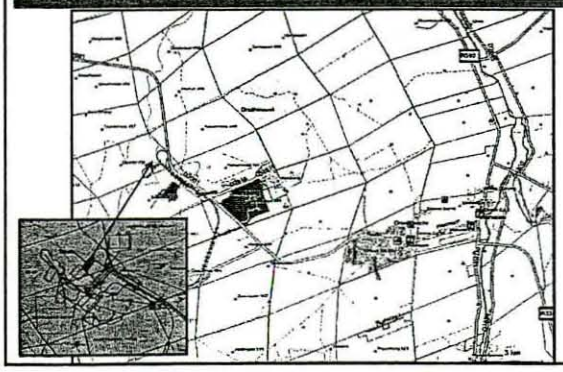
- Char Plant Location
- Reductants
- Char Market & Logistics
- Char Plant Description & Layout
- Char Plant Expansion

REDUCTANTS

- Used in the metals industry to reduce oxygen from ore to produce the basic metal
- Carbon is the fundamental component of a reductant
- FeCr industry uses a blend of Reductants namely:
  - Coke
  - Char
  - Coal
- Exxaro entered reductants market with existing char plant targeting the Ferrochrome (FeCr) market
- Good quality char can replace imported coke to some extent

SINTEL CHAR PLANT SITE

PLANT POSITION



MARKET - Ferrochrome

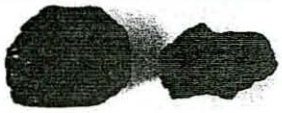
- Ferrochrome - Used in Stainless Steel production
- Ferrochrome vs Chrome ore export = benefit to SA economy
- Exxaro Char clients:
  - HERNIC - RUSTENBURG
  - ASSMANG - MACHADODORP
  - ASA METALS - BURGERSFORT
- Char transported by road to clients
  - Limited rail capacity from Lephalale
  - No rail offloading facilities available close to clients

CHAR PRODUCT OVERVIEW

6

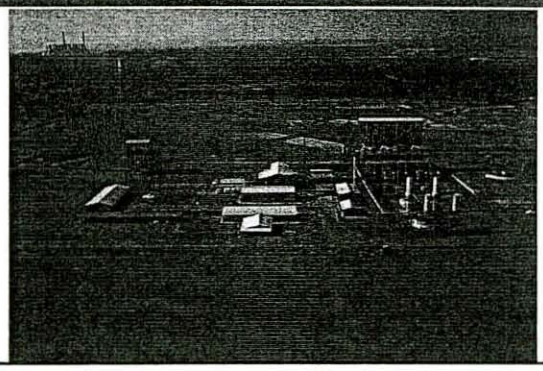
- What is Char?
  - Char is formed when coal is devolitised at temperature in the absence of oxygen
- Comparison between coal and char:

	COAL	CHAR
Fixed carbon	82.3%	84.2%
Ash	12.5%	14.4%
Volatiles	24.1%	1.3%



CHAR PLANT

9



7

CHAR PLANT – AS BUILT

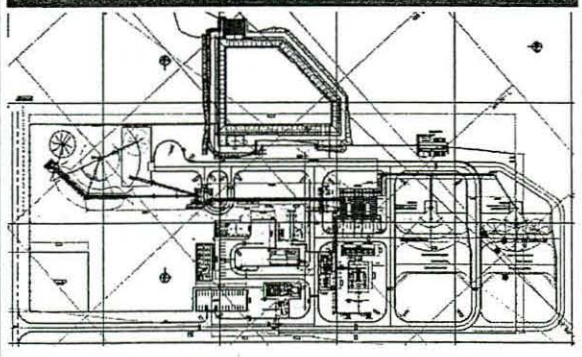
CHAR PLANT - OVERVIEW

10

- 4 Retort units commissioned between June and November 2009
- 140 ktpa Char production capacity
- Plant units:
  - Coal stockpile with plant feed conveyors
  - Product stockpile and handling area
  - Retorts with gas cleaning and cooling section
  - Tar storage and truck loading facility
  - Liquor destructor area with liquor buffer vessels
  - Excess gas flares
  - Utilities – Steam, Compressed Air, Diesel and LPG
  - Bunded areas for process and storage vessels
  - Pollution control dam
  - Non process buildings

CHAR PLANT LAYOUT - 2007

8



CHAR PROCESS

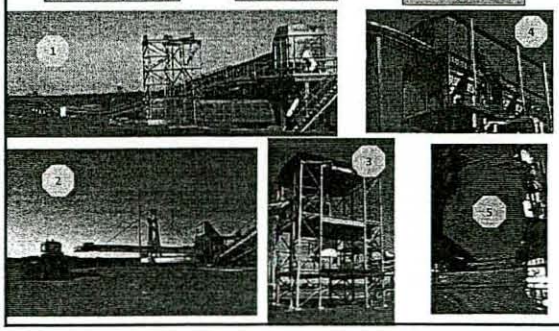
11

- CHAR PRODUCTION PROCESS
  - Feedstock is washed, sized and free of fines limiting the potential for coal dust generation.
  - Char process takes place in closed circuit
  - Involves the recycling of gaseous heat in the absence of oxygen to maximize recovery of carbon
  - Gas from the retort system is passed through electrostatic precipitators where tar and light oils are removed
  - Water condensate (liquor) from the cooling systems and gas booster fans are disposed of by liquor destructor that oxidises the contaminants at high temperature
  - Char product and tar is transported to the various clients by road transport
  - Raw, potable and process water is supplied from the Grootegeluk mine through dedicated pipe lines
  - Process water is used to quench the Char product leaving the retort.

Coal handling & transportation

12

Coal transported on overland conveyor to char plant → Coal stockpile → Coal handling system



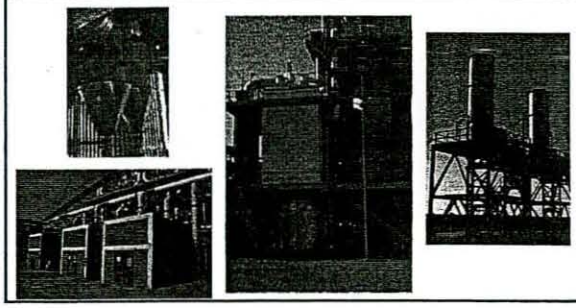
CHAR PLANT EXPANSION

15

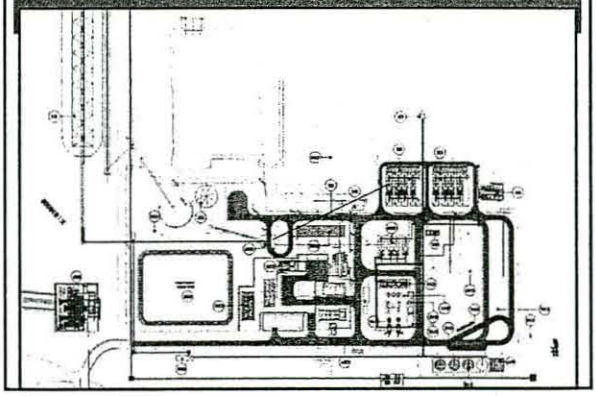
Gas handling system

13

Cyclone → Electrostatic precipitators → Gas coolers → Gas booster → Flare



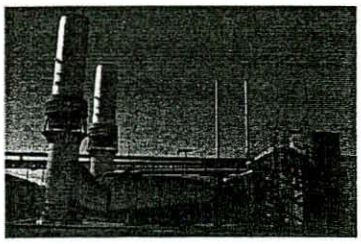
CHAR 2 PLANT LAYOUT



Waste liquor handling

14

Waste liquor destruction ← Waste liquor storage

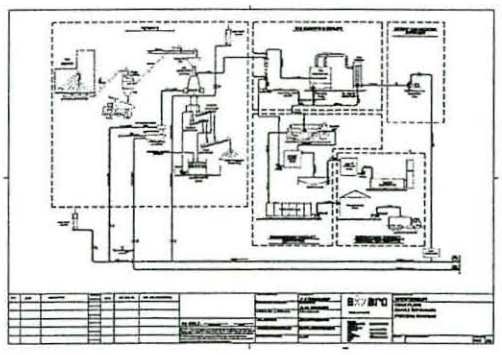


CHAR EXPANSION

17

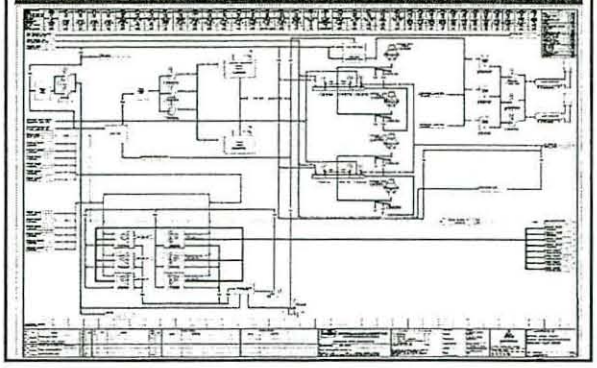
- 8 Additional retorts to be constructed next to original 4 retort units
- Char retort and gas circulation process layout to be duplicated
- Increase gas reticulation system and excess gas flare capacity
- Construct new product stockpile area with in-line screening
- Construct new Tar storage and truck loading facility
- Install additional liquor destructor capacity and liquor buffer tanks
- Construct a tar sludge (coal fines and tar mixture) handling area
- Increase size of coal feed stockpile with automated coal loading
- Increase area of non-process buildings
- Processes being investigated
  - Briquetting of char and coal fines
  - Utilisation of excess process gas and tar for power generation

PROCESS FLOW DIAGRAM

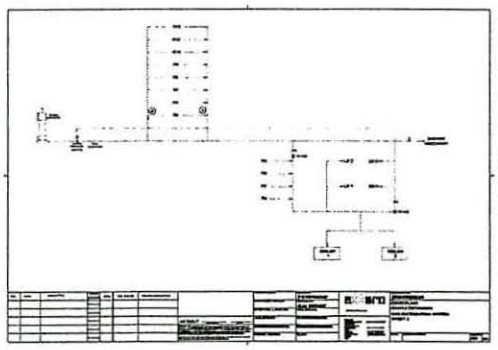


WATER BALANCES

21

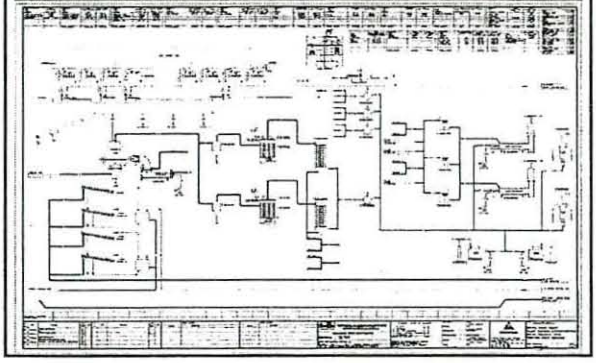


PROCESS FLOW DIAGRAM



GAS FLOW

22



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QUESTIONS ?

ENVIRONMENTAL QUANTIFICATION

23

APPROXIMATE EMISSION COMPARISON: kg/h

ITEM	DIESEL CAR	HAUL TRUCK	BOILER	RETORT
SOx	0.25	3.8	260	84
H-C	1.8	27	900	15
H-C #(Aromatic)	4.5	65	320	12
CO_2	3.5	54	1300	258
NOx	8	65	550	83
Particulate matter	0	0.1	150	3
H_2O	1.5	15	350	480
TOTAL OFF-GAS kg/h (Excluding H_2O, O_2 and N)	18	215	3830	455

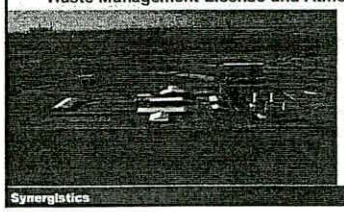
One Retort = 2.1 Haul Trucks' emission = 8.5 Bakkies' emission ; Retort/Boiler = 1/33

Process: Slow, Low temp, Low Oxygen versus Fast, High temp, Abundance of Oxygen

Exxaro Resources: Char, Coke & Co-generation Plants

Proposed Expansion of the Char Plant and Construction of the Coke Manufacturing and Electricity Co-generation Plants

Environmental Impact Assessment,
Environmental Management Programme (Amendment),
Integrated Water Use License Application (Amendment),
Waste Management License and Atmospheric Emissions License



Public Information Meeting
Date: 17th March 2011

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PURPOSE OF THE MEETING

- Discuss and explain the proposed projects
- Discuss the Environmental Legislative Processes
- Discuss the scope of supporting specialist studies
- Explain the Public Participation Process
- Provide Interested and Affected Parties with an opportunity to:
  - Ask questions
  - Raise issues and concerns
  - Be informed about the future phases of the project

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AGENDA

- Welcome, introduction and apologies (Synergistics)
- Purpose of meeting (Synergistics)
- Project Description (EXXARO)
  - Char Plant Expansion
  - Coke Manufacturing Plant
  - Co-generation Plant
- Environmental Legislative Processes (Synergistics)
  - Environmental Legislation and Reports Required
  - Specialist Studies
  - Public Consultation Process
- Questions and Discussion (Synergistics)
- Way Forward and Closure (Synergistics)

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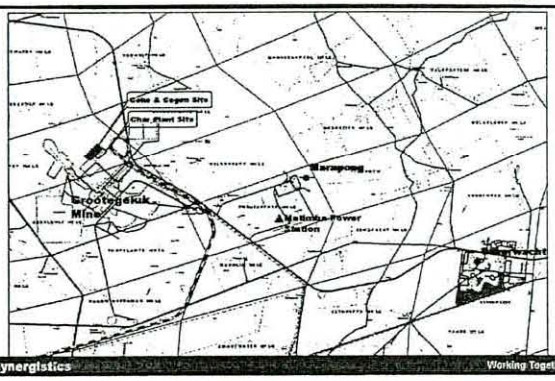
REGIONAL LOCALITY



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INTRODUCTION TO PROJECT TEAM

- Project Proponent
  - Exxaro Resources
    - Manager: Jaco van Dyk
    - Project Managers: Guillaume de Swart, Lomie Conradie & Gert Jansen van Rensburg
  - Exxaro Energy
    - Project Manager: Sachin Thakurpersad
  - Exxaro Environmental Specialist (Hydrologist)
    - Charles Linstrom
- Environmental Assessment Practitioner
  - Synergistics Environmental Services
    - Shelley Holt
    - Edwynn Louw
    - Mari Wolmarans (apologies)

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PROJECT DESCRIPTION

- Char Plant Expansion
- Coke Manufacturing Plant
- Co-generation Plant

(Exxaro presentation)

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ENVIRONMENTAL LEGISLATIVE PROCESSES

- **Summary of Environmental Legislative Processes**
  - National Environmental Management Act (No. 107 of 1998). Prohibits the commencement of certain controlled activities without authorisation from a competent authority. An EIA or BA may be required.
  - Mineral and Petroleum Resources Development Act (No.28 of 2002). The Char, Coke & Co-gen Plants are situated on mining land within the boundaries of Grootegeluk Mine.
  - National Water Act (No. 36 of 1998) promotes sustainable water use and protection. Section 21 lists 11 controlled activities which may not be undertaken without a Water Use License.
  - National Environmental Management Waste Act (No. 59 of 2008) prohibits the undertaking of listed waste management activities without a license from a competent authority.
  - National Environmental Management Air Quality Act (No. 39 of 2004). Regulates air quality to protect the environment and prevent pollution.

ENVIRONMENTAL LEGISLATIVE PROCESSES

- **National Water Act (NWA) (No. 36 of 1998)**
  - Section 21 of the Act lists water uses which require an Integrated Water Use License Application (IWULA):
    - Section 21 (b) Storing water
    - Section 21(g) Disposing of waste in a manner which may detrimentally impact on a water resource
  - IWULA (amendment)
    - An amendment to the exising Grootegeluk Mine IWUL will be submitted to the Limpopo Department of Water Affairs (DWA) for decision.

ENVIRONMENTAL LEGISLATIVE PROCESSES

- **National Environmental Management Act (NEMA)**
  - GN 543 of June 2010 defines the process for an Environmental Impact Assessment (EIA) and a Basic Assessment (BA)
  - EIA
    - Public Participation
    - Scoping Report
    - Environmental Impact Assessment Report
    - Environmental Management Programme
  - BA
    - Public Participation
    - Basic Assessment Report
    - Environmental Management Programme
  - EIA and BA reports
    - Will be submitted to Limpopo Department of Economic Development, Environment and Tourism (LEDET) for decision.

ENVIRONMENTAL LEGISLATIVE PROCESSES

- **National Environmental Management: Air Quality Act (NEMAQA) (No. 39 of 2004)**
  - GN 248 of March 2010 lists activities which require an Atmospheric Emissions License (AEL). These activities include Char and Coke Manufacturing Plants.
  - AEL
    - An AEL application will be submitted to the Limpopo Department of Economic Development, Environment and Tourism (LEDET) for decision.

ENVIRONMENTAL LEGISLATIVE PROCESSES

- **Mineral And Petroleum Resources Development Act (MPRDA)**
  - The MPRDA requires an Environmental Management Programme (EMP) for activities on mining land which could impact the environment.
  - EMP
    - Public Participation
    - Scoping Report
    - Environmental Impact Assessment Report
    - Environmental Management Programme
  - EMP
    - Will be submitted to the Limpopo Department of Mineral Resources (DMR) for decision.

ENVIRONMENTAL LEGISLATIVE PROCESSES

- **National Environmental Management Waste Act (NEMWA)**
  - Process to be followed is the same as that of an EIA.
  - GN 718 of July 2009 lists activities which require a Waste Management License (WML):
    - Section 4 states that a WML is required for the storage or reuse of hazardous waste. The waste for the Char and Coke Plants will be classified by a waste specialist.
  - WML (incl. EIA) report
    - Public Participation
    - Scoping Report
    - Environmental Impact Assessment Report
    - Environmental Management Programme
  - WML
    - Submitted to the Waste Management Division of the National Department of Environmental Affairs (hazardous waste)

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SPECIALIST STUDIES

- **What are the key environmental sensitivities which require specialist studies:**
  - Groundwater Impacts
  - Surface Water Impacts
  - Waste Streams produced at the Char Plant
  - Air Quality Impacts
  - Traffic Impacts

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SPECIALIST STUDIES

- Surface Water
  - Information review and gap analysis
  - Water balance and salt balance
  - Surface water runoff and drainage components
  - Surface water impact assessment
  - Management and monitoring
  - Technical inputs into the IWULA

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SPECIALIST STUDIES

- **The following specialist studies will be undertaken in support of the EIA, EMP, Water Use License, Atmospheric Emissions License and Waste Management Licence Applications**
  - Groundwater – ERM (Robel Gebrekristos and Hesma Cockrell)
  - Surface water – Jones and Wagener (Mike Palmer)
  - Waste Stream Analysis – Golder and Associates (Elize Herselman and Leon Bredenhann)
  - Air Quality – Airshed Planning Professionals (Gerrit Kornelius). The AEL application will be compiled by Julius van Graan.
  - Traffic Impact Assessment – WSP (Rod Strong and Cornelia Hutchinson)

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SPECIALIST STUDIES

- Waste Stream Analysis
  - Identification of waste streams at Char, Coke and Co-gen Plants
  - Assessment of waste streams
  - Legislative requirements
  - Impact assessment
  - Management and monitoring measures
  - Technical inputs into the WML

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SPECIALIST STUDIES

- Groundwater
  - Information review and gap analysis
  - Hydrocensus
    - Borehole drilling
    - Groundwater samples
    - Hydro-chemical analysis
- Conceptual groundwater model
    - Characteristics
    - Groundwater flow, rate and direction
    - Groundwater recharge
- Groundwater impact assessment
- Management measures and monitoring

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SPECIALIST STUDIES

- Air Quality
  - Identification of atmospheric emissions
  - Identification of sensitive receptors
  - Simulation of
    - PM10 concentrations (fine dust particles)
    - Dust fallout
  - Evaluation of human health risks
  - Recommendations
    - Mitigation measures
    - Air quality monitoring programme
  - Technical inputs into the AEL

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SPECIALIST STUDIES

- Traffic
  - Site inspection
  - Visual assessment of existing conditions
  - Sample traffic counts at selected intersections
  - Forecast future traffic conditions
  - Management measures to mitigate potential impacts

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DISCUSSION AND QUESTIONS

?

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PUBLIC PARTICIPATION

- **Public consultation process involves:**
  - Informing IAPs about the project
  - Provide opportunity for IAPs to comment
  - Maintain a register of IAPs and comments
  - Provide an opportunity for IAPs to review and comment on all reports
  - IAP comments must be included in reports submitted to authorities

Synergistics Working Together

CONTACTS

ENVIRONMENTAL CONSULTANTS:

Synergistics Environmental Services:

Mari Wolmarans and Shelley Holt

Tel: 011 807 8225 Fax: 011 807 8226

PO Box 1822, Rivonia, 2128

Email: shelley@synergistics.co.za

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WAY FORWARD

- **Written comments from IAPs**
- **Scoping Report(s) for public review**
- **Draft IWULA Amendment Report for public review**
- **Submission of Scoping Report(s) and Draft IWULA Report to authorities**
- **Engineering designs to be completed**
- **Specialist studies to be completed**
- **IAPs to review final reports before submission**
- **Final EIA, EMP, IWULA, Atmospheric Emissions License and Waste Management License submission to authorities for approval**

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Appendix 6: Minutes of Authorities Meetings

August 2010

MINUTES OF MEETING

Project: **Expansion of the Sintel Char Plant**

Meeting: **Authorities Information Meeting**

Date & Venue: African Roots Guesthouse
12th of August 2010; 12:00pm

Compiled by: Vivienne Vorster
Synergistics Environmental Services

ATTENDANCE:

PROJECT PROPONENTS

Charles Linstrom	CL	Exxaro Head Office
Guillaume De Swart	GS	Exxaro Head Office
Edwin Mogoane	EM	Sintel Char Plant

ENVIRONMENTAL CONSULTANTS

Mari Wolmarans	MW	Synergistics Environmental Services
Vivienne Vorster	VV	Synergistics Environmental Services

AUTHORITIES

Masemola Mailetse	MM	Department of Agriculture, Forestry and Fisheries

APOLOGIES:

None

MINUTES OF MEETING:

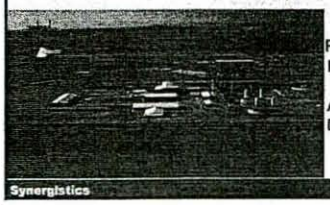
	Welcome, Introduction and Project Presentation
	VV opened the meeting and indicated that the purpose was to: • *Discuss the proposed expansion of the Sintel Char Plant; and* • *To inform the public about the proposed project and to take note of any comments, queries and question which they may have* *VV gave a brief description about the Sintel Char Plant and the proposed expansion project, and then handed over to GS to give an overview of the technical process involved.* *GS gave a detailed explanation of the proposed expansion project. He also discussed the Char Plant process, inputs, outputs and infrastructure involved in detail.* *VV continued the presentation outlining the environmental authorisation and legislation requirements, the specialist studies to be undertaken as well as the purpose and function of the public participation process.*
	Questions and Comments
	MM asked where the water that the Sintel Char Plant uses comes from? *GS answered that raw, process and potable water is supplied from the Grootegeluk Mine via dedicated pipelines.*
	MM asked whether the Sintel Char Plant has a Water Use License and how much water is extracted? *GS answered that the Sintel Char Plant is approved under the existing Grootegeluk Mine Water Use License. The Char Plant does not extract water for any purpose.*
	MM enquired when construction will begin and when the expansion will be operational? *GS answered that construction is anticipated to start in the 3rd quarter of 2011 and the expanded plant should be operational by October 2012.*
	There were no further questions and the meeting was closed at 13:30pm. The attendees were thanks for their attendance.
	Please see the full presentation attached herewith as Appendix A

Appendix A: Presentation

Exxaro Resources: Sintel Char Plant

Proposed Expansion of the Sintel Char Plant

Environmental Impact Assessment (Amendment),
Environmental Management Programme,
Integrated Water Use License Application (Amendment) and
Waste Management License



Public Information Meeting
Date: 11th August 2010

Authorities Information Meeting
Date: 12th August 2010

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PURPOSE OF THE MEETING

- Discuss and explain the proposed project (i.e the expansion of the Sintel Char Plant)
- Discuss the Environmental Legislative Processes
- Discuss the scope of supporting specialist studies
- Public Participation Process
- Provide Interested and Affected Parties with an opportunity:
  - Ask questions
  - Raise issues and concerns
  - To be addressed in the future phases of the project

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AGENDA

- Welcome, introduction and apologies
- Purpose of meeting
- Brief Overview of Sintel Char Plant
- Project Description
  - EXXARO
- Environmental Legislative Processes
- Specialist Studies
- Public Consultation Process
- Questions and Discussion
- Way Forward and Closure

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INTRODUCTION

- Exxaro Resources (Pty) Ltd owns and operates the Sintel Char Plant which is situated within the boundaries of the Grootegeluk Mine.
- Exxaro Resources is a separate entity from Exxaro Coal (Pty) Ltd, and have a lease agreement in place with Grootegeluk Mine
- The Sintel Char Plant, which covers and area of ~5.5ha, has been in operation since 2009
- Wish to expand the existing Char plant by increasing the number of retorts from 4 to a maximum of 10,
- The footprint of the expansion will also be ~5.5ha. The entire footprint of the Char land is ~13.9ha.
- The expansion will be located adjacent to the existing plant and will effectively double their current production rates

Synergistics — Working Together

Introduction to Project Team

- **Project Proponent**
  - Exxaro Resources – Sintel Char Plant
    - Manager: Jaco van Dyk
  - Exxaro HQ -
    - Project Manager: Guillaume de Swardt / Lomie Conradie
  - Exxaro Environmental Specialist Unit
    - Charl Nolte
- **Environmental Assessment Practitioner**
  - Synergistics Environmental Services
    - Mari Wolmarans
    - Vivienne Vorster
- **Specialist Team – details to follow**

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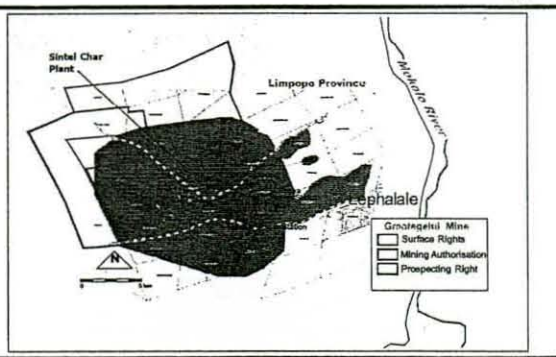
REGIONAL LOCALITY



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PROJECT DESCRIPTION

- Exxaro Presentation

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Environmental Legislative Processes

- **Mineral And Petroleum Resources Development Act (MPRDA)**
  - EMP
    - Public Participation
    - Scoping Report
    - Environmental Impact Assessment Report
    - Environmental Management Programme
  - EMP submitted to the Limpopo Department of Mineral Resources (DMR)

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ENVIRO-LEGAL REQUIREMENTS

- ENVIRONMENTAL LEGISLATIVE PROCESSES
  - National Environmental Management Act (No. 107 of 1998) prohibits the commencement of certain controlled activities without authorisation from a competent authority.
  - Mineral and Petroleum Resources Development Act (No.28 of 2002). Char plant is situated on mining land within the boundaries of Grootegeluk Mine
  - National Water Act (No. 36 of 1998) promotes sustainable water use and protection. Section 21 lists 11 controlled activities which may not be undertaken without a Water Use License
  - National Environmental Management Waste Act (No. 59 of 2008) prohibits the undertaking of listed waste management activities without a license from a competent authority.
  - National Environmental Management Air Quality Act (No. 39 of 2004). Reform the law regulating air quality to protect the environment and prevent pollution

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Environmental Legislative Processes

- **National Water Act (NWA) (No. 36 of 1998)**
  - Section 21 uses which require the submission of an Integrated Water Use License Application (IWULA):
    - Section 21 (b) Storing water
    - Section 21(g) Disposing of waste in a manner which may detrimentally impact on a water resource
  - IWULA (amendment)
    - Submitted to the Limpopo Department of Water Affairs (DWA) for authorisation
- **National Environmental Management Air Quality Act (No. 39 of 2004).**
  - Atmospheric Emissions License will be submitted to DEA under the

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Environmental Legislative Processes

- **National Environmental Management Act (NEMA)**
  - GN 543 of June 2010 defines the process for undertaking an Environmental Impact Assessment (EIA)
  - EIA
    - Public Participation
    - Scoping Report
    - Environmental Impact Assessment Report
    - Environmental Management Programme
  - EIA (amendment)
    - Submitted to Limpopo Department of Economic Development, Environment and Tourism (LEDET) for authorisation

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Environmental Legislative Processes

- **National Environmental Management Waste Act (NEMWA)**
  - Process to be followed is the same as that of an EIA
  - Published in the EIA regulations (GN 543 of June 2010)
  - Waste Management Licence/EIA report
    - Public Participation
    - Scoping Report
    - Environmental Impact Assessment Report
    - Environmental Management Programme
  - Submitted to the Waste Management Division of the Department of Environmental Affairs (national authorities – hazardous waste)

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PROJECT DESCRIPTION – Environmental Considerations

- What are the key environmental sensitivities:
  - Groundwater Impacts
  - Surface Water Impacts
  - Waste Streams produced at the Char Plant
  - Air Quality Impacts

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Specialist Studies

- Surface Water
  - Information review and gap analysis
  - Water balance and salt balance
  - Surface water runoff and drainage components
  - Surface water impact assessment
  - Management and monitoring
  - Technical inputs into the IWULA

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Specialist Studies

- The following specialist studies will be undertaken in support of the EIA, EMP, IWULA and Waste Management Licence Application
  - Groundwater – ERM (Alkie Marais & Hesma Cockrell)
  - Surface water – Jones and Wagener (Chris Waygood)
  - Waste Stream Analysis – Golder and Associates (Leon Bredenhann)
  - Air Quality – Airshed Planning Professionals
  - Traffic Impact Assessment – WSP

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Specialist Studies

- Waste Stream Analysis
  - Identification of waste streams at Char Plant
  - Assessment of waste streams
  - Legislative requirements
  - Impact assessment
  - Management and monitoring measures

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Specialist Studies

- Groundwater
  - Information review and gap analysis
  - Hydrocensus
    - Borehole drilling
    - Groundwater samples
    - Hydro-chemical analysis
- Conceptual groundwater model
    - Characteristics
    - Groundwater flow, rate and direction
    - Groundwater recharge
- Groundwater impact assessment
- Management measures and monitoring

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Specialist Studies

- Air Quality
  - Identification of atmospheric emissions
  - Identification of sensitive receptors
  - Simulation of
    - PM10 concentrations
    - Dust fallout
  - Evaluation of human health risks
  - Recommendations
    - Mitigation measures
    - Air quality monitoring programme

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Specialist Studies

- Traffic
  - Site inspection
  - Visual assessment of existing conditions
  - Sample traffic counts at selected intersections
  - Forecast future traffic conditions
  - Management measures to mitigate potential impacts

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DISCUSSION AND QUESTIONS

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Public Participation

- Public consultation process involves:
  - Notifying IAPs of the project
  - Provide opportunity for IAPs to comment
  - Maintain a register of IAPs and comments
  - Provide an opportunity for IAPs to review and comment on all reports;
  - Comments must be included in reports submitted to authorities

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CONTACTS

ENVIRONMENTAL CONSULTANTS:

Synergistics Environmental Services:

Mari Wolmarans and Vivienne Vorster

Tel: 011 807 8225 Fax: 011 807 8226

PO Box 1822, Rivonia, 2128

Email: vivienne@synergistics.co.za

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Way Forward

- **Written comments from IAPs**
- **Scoping Report(s) for public review**
- **Draft IWULA Amendment Report for public review**
- **Submission of Scoping Report(s) and Draft IWULA Report to authorities**
- **Engineering designs to be completed**
- **Specialist studies to be completed**
- **IAPs to review final reports before submission**
- **Final EIA, EMP, IWULA, Atmospheric Emissions License and Waste Management License submission to authorities for approval**

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11 August 2010

PRESENTATION ENVIRONMENTAL:
PUBLIC INFORMATION AND PARTICIPATION MEETING
SINTEL CHAR EXPANSION

exxaro
POWERING POSSIBILITY

REDUCTANTS

CONTENTS

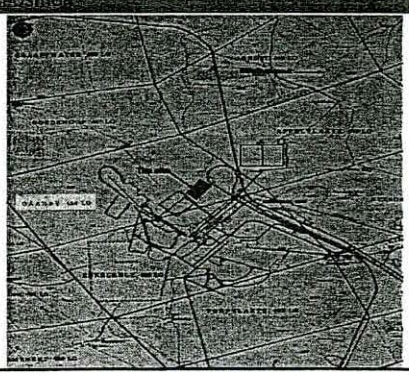
- Char Plant Location
- Reductants
- Char Market & Logistics
- Char Plant Description & Layout
- Char Plant Expansion

REDUCTANTS

- Used in the metals industry to reduce oxygen from ore to produce the basic metal
- Carbon is the essential component of a reductant
- Exxaro entered reductants market with existing char plant targeting the Ferrochrome (FeCr) market
- Reductants in use in FeCr industry is a blend of:
  - Coke
  - Char
  - Coal
- Good quality char can replace imported coke to some extent

SINTEL CHAR PLANT SITE

PLANT POSITION



MARKET - Ferrochrome

- Ferrochrome - main constituent in Stainless Steel production
- Ferrochrome vs Chrome ore export = benefit to SA economy
- Exxaro Char clients:
  - HERNIC - RUSTENBURG
  - ASSMANG - MACHADODORP
  - ASA METALS - BURGERSFORT
- Char transported by road to clients
  - Limited rail capacity from Lephalale
  - No rail facilities available close to clients

CHAR PRODUCT OVERVIEW

6

- What is Char?
  - Char is formed when coal is devolitised at temperature in the absence of oxygen
- Comparison between coal and char:

	COAL	CHAR
Fixed carbon	82.3%	84.2%
Ash	12.5%	14.4%
Volatiles	24.1%	1.3%

CHAR PLANT

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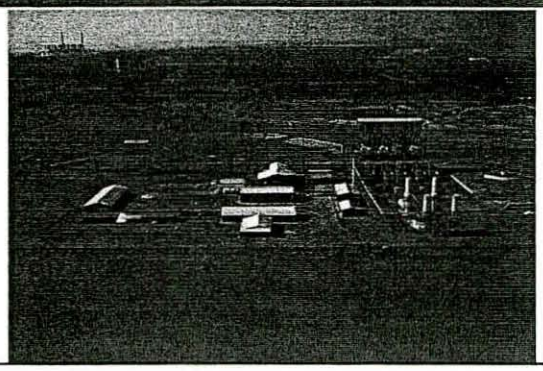

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CHAR PLANT – AS BUILT

CHAR PLANT - CURRENT

10

- 140 ktpa Char production capacity
- 4 Retort units commissioned between June and November 2009
- Plant units:
  - Coal stockpile with plant feed conveyors
  - Product stockpile and handling area
  - Retorts with gas cleaning and cooling section
  - Tar storage and truck loading facility
  - Liquor destructor area with storage vessels
  - Excess gas flares
  - Utilities – Steam, Compressed Air, Diesel and LPG
  - Bunded areas for process and storage vessels
  - Pollution control dam
  - Buildings

CHAR PLANT LAYOUT - 2007

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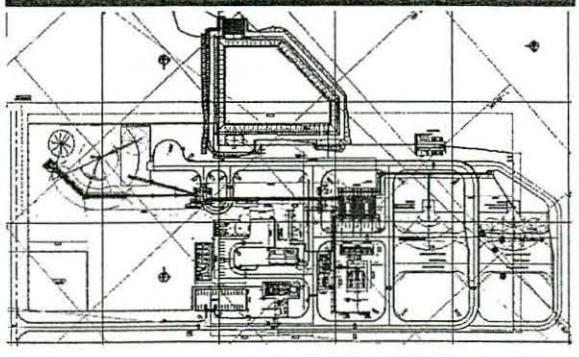


SINTEL CHAR PLANT PROCESS

11

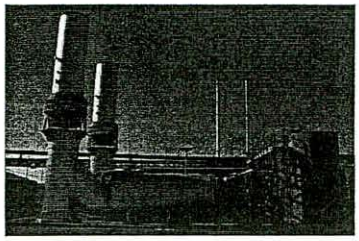
- CHAR PLANT
  - CHARACTERISTICS OF THE PROCESS
    - Feedstock is washed, sized and free of fines limiting the potential for coal dust generation.
    - Char process takes place in closed circuit
    - Involves the recycling of gaseous heat in the absence of oxygen which maximizes recovery of lumpy carbon
    - Gas from the retort system is passed through electrostatic precipitators, which removes tars and light oils from the gas
    - Water condensate (liquor) from the cooling systems and gas booster fans are disposed of through a liquor destructor that burns of the contaminants

SINTEL CHAR PLANT PROCESS (cont.)

- CHARACTERISTICS OF THE PROCESS (Cont.)
  - Char product and tar is transported to the various clients by road transport
  - Raw, potable and process water is supplied from the mine through a dedicated supply
  - Process water is used to quench the Char Product leaving the retort.
- RUN-OF-MINE FEEDSTOCK
  - Coal is washed, crushed and screened at the mine
  - Coal is then transported via overland conveyor and stockpiled at the CHAR PLANT Site.

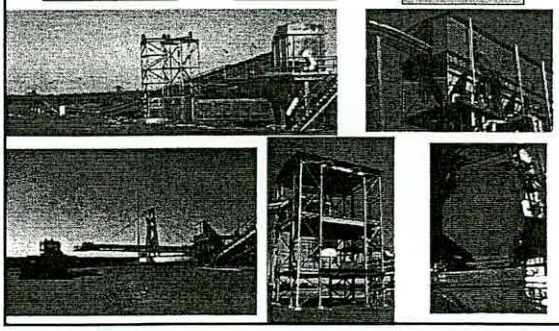
Waste liquor handling:

Waste liquor destruction ← Waste liquor storage



Coal handling & transportation:

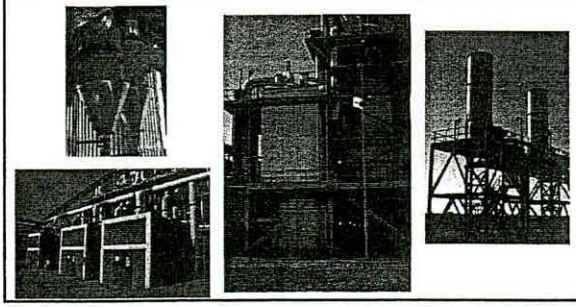
Coal transported on overland conveyor to char plant → Coal stockpile → Coal handling system



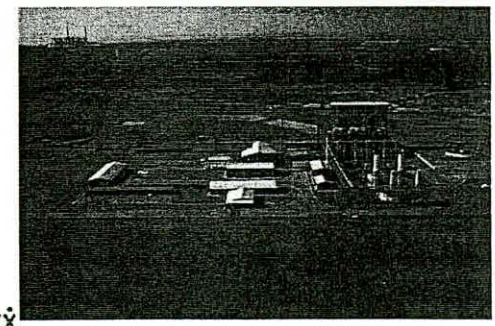
CHAR PLANT EXPANSION

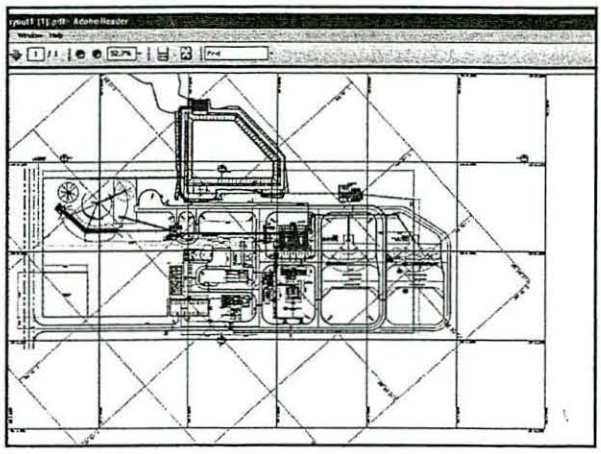
Gas handling system:

Cyclone → Electrostatic precipitators → Gas coolers → Gas booster → Flare



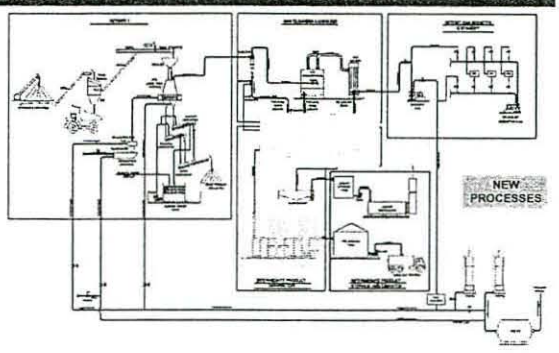
CHAR PLANT





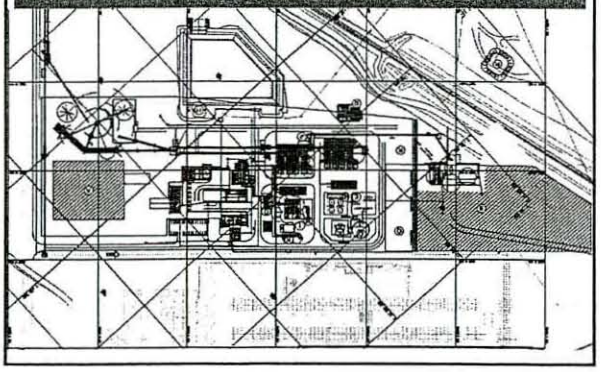
PROCESS FLOW DIAGRAM

21



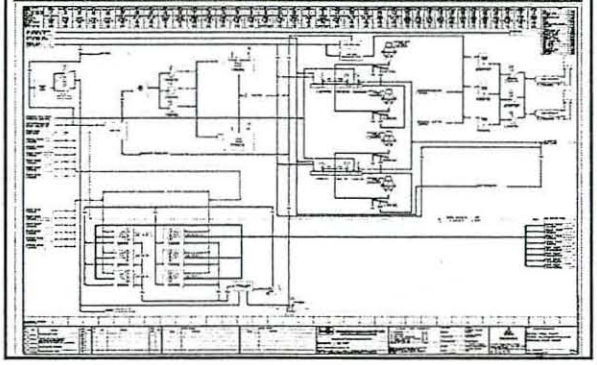
CHAR 2 PLANT LAYOUT

19



WATER BALANCES

22



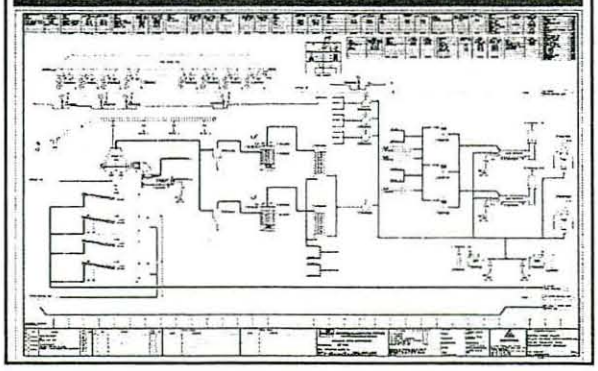
CHAR EXPANSION

20

- 4 Additional retorts to be constructed next to original 4 Retort units
- Char retort and gas circulation process layout to be duplicated
- Increase gas reticulation system and excess gas flare capacity
- Construct new product stockpile area with in-line screening
- Construct new Tar storage and truck loading facility
- Install additional liquor destructor capacity and liquor
- Construct a tar sludge (coal fines and tar mixture) handling area
- Construct a tar sludge storage and reclamation facility
- Increase size of coal feed stockpile with automated coal loading
- Increase area of non-process buildings
- Processes being investigated
  - Briquetting of char and coal fines
  - Utilisation of excess process gas

GAS FLOW

23



ENVIRONMENTAL QUANTIFICATION

APPROXIMATE EMISSION COMPARISON: kg/h

ITEM	DIESEL CAR	HAUL TRUCK	BOILER	RETORT
SOx	0.25	3.8	260	84
H-C	1.8	27	900	15
H-C #(Aromatic)	4.5	65	320	12
CO_2	3.5	54	1300	258
NOx	8	65	550	83
Particulate matter	0	0.1	150	3
H_2O	1.5	15	350	480
TOTAL OFF-GAS kg/h (Excluding H_2, O_2 and N_2)	**18**	**215**	**3830**	**455**

One Retort = 2.1 Haul Trucks' emission = 8.5 Bakkies' emission ; Retort/Boiler = 1/33

Process: Slow, Low temp, Low Oxygen versus Fast, High temp, Abundance of Oxygen

XX

MEETING: Sinter Chmr expansion [illegible] Meeting

DATE: 12 Aug 2010

ATTENDANCE REGISTER

NAME	SURNAME	ORGANISATION	TEL	FAX	CELLPHONE	E-MAIL	POSTAL ADDRESS AND PHYSICAL ADDRESS
MAILETSE	MASEMOLA	DAFF	0152879940	0152977993	0823148397	MailetseM@nda.agric.za.	BOX 3620 POLOKWANE 89 BICARD STREET

March 2011

MINUTES OF MEETING

Project:	**Exxaro Projects: Grootegeluk Char Plant Expansion, and Coke and Co-gen Plant**
Meeting:	**Authority Meeting**
Date & Venue:	16 March, 2011 Department of Mineral Resources (Polokwane)
Compiled by:	Edwynn Louw and Shelley Holt Synergistics Environmental Services

Synergistics Environmental Services

Johannesburg: Tel: 011 807 8225, Fax: 011 807 8226
PO Box 1822, Rivonia, 2128
64 Wessels Road, Rivonia

Eastern Cape: Tel: 041 583 1156, Fax: 086 562 0165
Suite 71, P Bag X13130, Humewood,
Port Elizabeth, 6013

KwaZulu Natal: Tel/Fax: 033 343 4642
15 Quarry Road, Hilton, 3201

ATTENDANCE:

Name	Telephone	Email
Edwynn Louw	011 807 8225	edwynn@synergistics.co.za
Shelley Holt	011 807 8225	shelley@synergistics.co.za
Azwi Mulaudzi	015 287 4700	azwihangwisi.mulaudzi@dmr.gov.za
Emily Munyai	015 287 4749	emily.munyai@dmr.gov.za
Charles Linstrom	012 307 4100	charles.linstrom@exxaro.com

MINUTES:

Charles Linstrom – Exxaro (CL) and Shelley Holt - Synergistics (SH): Provided the DMR with copies of the background information document. SH and CL explained the project location and described the project. Exxaro would like to update the entire EMPr (Golder will do this) and add an addendum to incorporate the new Char, Coke and Co-generation projects.

Question/Issue Raised:	Answer:
Azwi Malaudzi – DWA (AM): What do you produce?	**CL:** Char. We want to expand our plant and add a coking process (explained process).
AM: Are you using waste coal?	**CL:** No, we are using coal product from bench 11 and 13 at Grootegeluk Mine which is ideal for process.
AM: So the current plant is a Char plant, and now you want to expand Char and construct Coke and Co-Generation plants?	**SH and CL:** Yes, (explained process).
SH: We will do EMP amendment, update closure costing etc. This will be a separate document (from the current EMP update of the entire Grootegeluk Mine). This is due to different pollutants. Do you think this will be acceptable?	**AM:** For administrative purposes, we want one EMP and not several amendments to the EMP. **CL:** We will try to align the Char, Coke and Co-gen EMP with the whole Grootegeluk Mine EMP update.

AM: DMR requires a scoping report, then the EMP. When submitting reports, submit in parallel to DWA, DEA etc. so ensure that you meet all legislation.	**SH**: We will do this.
AM: What is Coke? Whom are you selling it to?	**CL:** Coke is formed by compressing coal and then heating it to remove impurities. Coke is used to produce steel. **CL:** We sell it to many clients, such as chrome producers and smelters.
AM: Will there be water pollution as a result of these plants?	**CL:** We are decreasing existing water pollution on the mine property. The groundwater pollution plume is being reduced. In our water use license there are stipulations to manage this. We have written a water and waste management plan. **SH:** The new construction is not likely to have a significant detrimental impact on ground water. **CL:** Construction is to take place on an old coal stockpile site used in the 1970s. We have taken out all coal from the construction area, so no further pollution will leach from this coal to the groundwater.

CHAR, COKE AND CO-GEN PROJECTS AT GROOTEGELUK MINE, LEPHALALE

AUTHORITIES MEETING WITH DMR

Synergistics
Environmental Services

Johannesburg: Tel: 011 807 8225, Fax: 011 807 8226
PO Box 1822, Rivonia, 2128
64 Wessels Road, Rivonia

Eastern Cape: Tel: 041 583 1156, Fax: 086 562 0165
Suite 71, P Bag X13130, Humewood,
Port Elizabeth, 6013

KwaZulu Natal: Tel/Fax: 033 343 4642
15 Quarry Road, Hilton, 3201

Date: Wed 16 March 2011

Time: 10H00 – 11H30

Venue: DMR Office, Polokwane

AGENDA

1. **INTRODUCTION AND PURPOSE OF THE MEETING**

2. **BRIEF PROJECT DESCRIPTIONS**
   - **2.1 Char Plant Expansion**
   - **2.2 Coke Manufacturing Plant**
   - **2.3 Co-generation Plant**

3. **EMP AMENDMENT**
   - **3.1 EMP Amendment Process and Reports to be Compiled**
   - **3.2 Specialist Studies**
   - **3.3 Public Consultation Process**

4. **QUESTIONS AND DISCUSSION**

5. **WAY FORWARD**

6. **CONCLUSION**

GROOTEGELUK MINE CHAR, COKE AND CO-GEN PROJECTS

DMR MEETING 16 MARCH 2011

ATTENDANCE REGISTER

NAME	POSITION	TEL	FAX	E-MAIL	POSTAL ADDRESS
S. Holt	Environmental Scientist	0118078225	0118078226	shelley@synergistics.co.za	
Azwi Mulaudzi	D.D: Environment	015 2974700	015 287 4729	azwihangwisi.mulaudzi@dmr.gov.za	101 Dorp street Polokwane, 0700
Emily Munyai	Environmental officer	015 287 4749		emily.munyai@dmr.gov.za	
Charles Linström	EXXARO - HYDROLOGIST	0123074100		charles.linström@exxaro.com	PO BOX 12349 DIE HOEWES 0163
E. Louw	Environmental scientist	0118078225		edwynn@synergistics.co.za	

Presentation given at all authority meetings

17 MARCH 2011

CHAR & MARKET COKE ENERGY RECOVERY PLANTS

EIA Public Participation Presentation

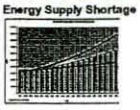
Sachin Thakurpersad / Gert Jansen van Rensburg

exxaro

POWERING POSSIBILITY

Why Electricity Generation?

Energy Supply Shortage



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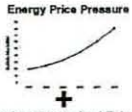
Energy Price Pressure



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Carbon Constrained Future

exxaro

Business Response:
Prepare for a Low-Carbon, Energy Constrained Future with Sustainability

Impacts on Business

Negative impacts on

What Does it mean for Exxaro and its Stakeholders

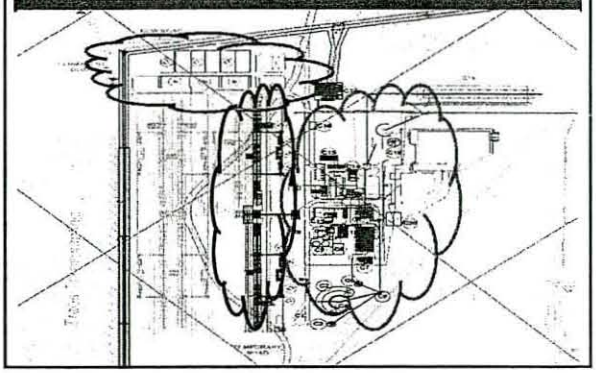
- Improving energy efficiency-More Electricity for Communities
- Designing for efficiency
- Carbon offsets-Greener Economy
- Lower harmful emissions into atmosphere.
- Cleaner processes

Objectives

To provide:

- A rationale for electricity generation by effective usage of waste heat and discard materials;
- Ensuring compliance to Environmental protection legislation requirements by using modern process technology;
- An overview of the Market Coke Co-generation plant;
- An overview of the Char Energy Recovery plant;
- Coke Process Video Clip

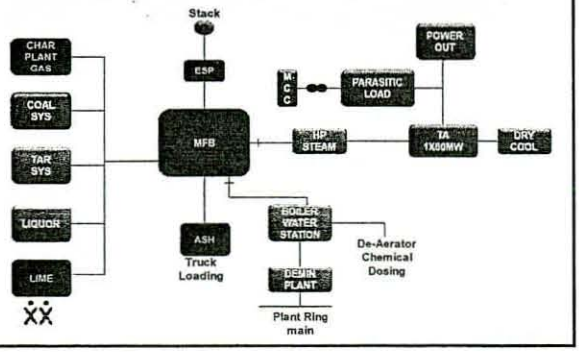
Site Layout/Location



Introduction

- Char plant Produces the following Streams:
  - Tar
  - Liquor
  - Off Gas
  - Char
- Coke Ovens Produce
  - Waste Heat/Hot gas
  - Coke product
- The Waste Heat/Off-gas energy can be used for electricity generation;
- The aim is to build a plant to generate
  - 70 MW of electricity from Coke Oven Flue Gas (COFG) produced by Coke Plant using Waste Heat Recovery Boiler (WHRB) technology
  - 60 MW of Electricity from the Streams from the Char Plant with supplement of Discard Coal using Circulating Fluidized Bed (CFB) Boiler technology

Char Co-Generation Plant



Emission Levels Comparison

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Emissions, Power, Or Product	Coal Fired Power Plant 240 ktpa	Coke Plant Without Co-gen 240 ktpa	Coke and Energy Plant 750 ktpa	Integrated Coke, Char and Energy 750 & 735 ktpa	SANS Specification	Air Quality Act - March 2010 (Sec.10 -1.4) Char CFB	Air Quality Act - March 2010 (Sec.10 -1.4) (Sec. 12-3) Coke WHRB
SO_2 (mg/Nm³)	2180	460	345	260	350	500 (existing)	400 (new)
NO_x (mg/Nm³)	3180	528	390	240	200	300 (existing)	700 (new)
CO_2 (%)	26	7,3	5,5	6,3	n/a	Unspecified	Unspecified
PM (mg/Nm³)	380	84	80	48	25 (daily)	10	50 (new)
H_2S (mg/Nm³)	High	0	0	0	n/a	Unspecified	[illegible]
PAH, VOC (mg/ Nm³)¹		tbd	tbd	tbd		0.5 (Expensive Measuring Eq.)*	Not listed
Power	60 MW	(20 MW waste heat)	60 MW	70 MW & 60 MW			
Product		132 ktpa	450 ktpa	450 & 515 ktpa			

FOR COMPARISON PURPOSES ONLY
Coal fired power station

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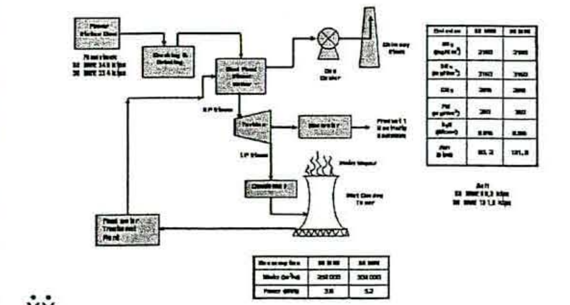

Coke Plant without Co-gen

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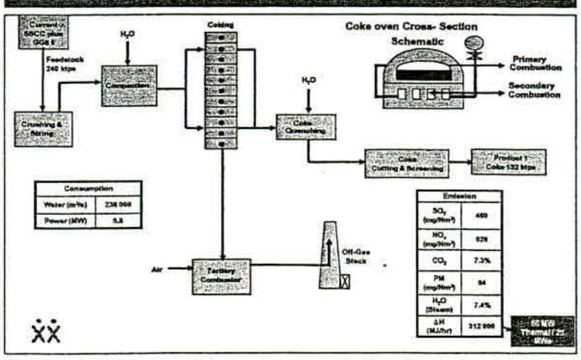

Coke Plant with Co-gen

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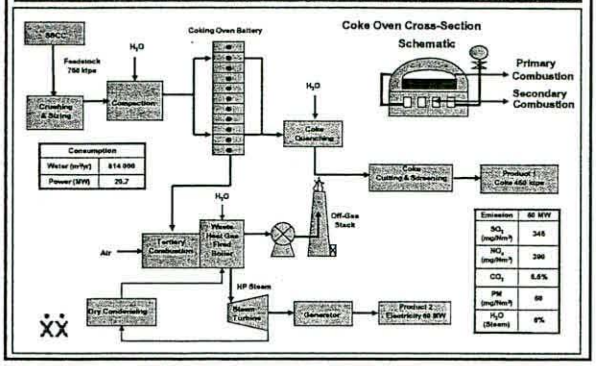

Integrated Coke, Char and Co-gen

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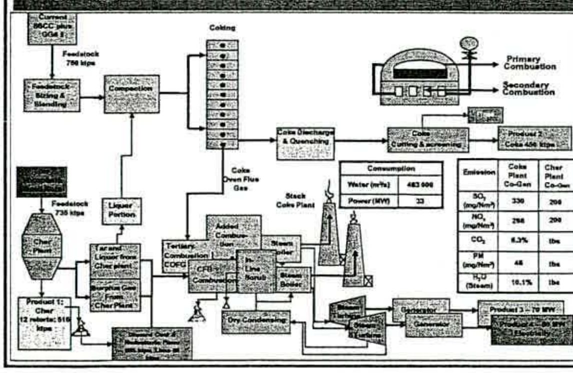
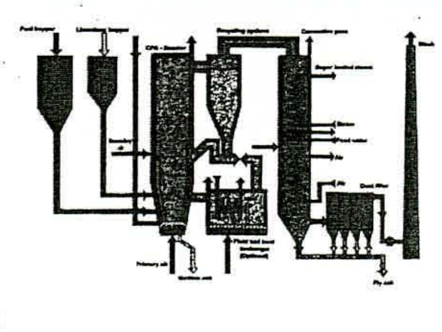


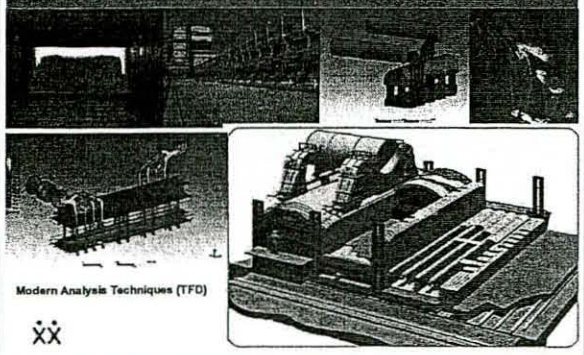
Circulating Fluidized Bed (CFB) Boiler

11



Coke Process and Plant Examples

12



Modern Analysis Techniques (TFD)

Questions

15

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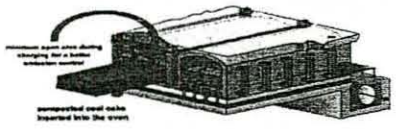
Emission Reduction Features

13

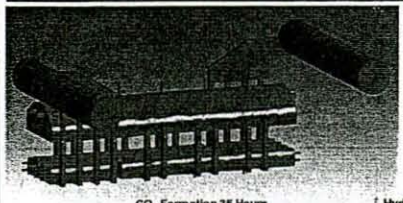
Increase of Coke Quality and Reduction of Emissions by Stamp Charging at Heat Recovery Ovens



- Modern Design Technology – Negative Pressure process
- Complete Combustion, sufficient Air addition before WHRB entry
- Tertiary or Quaternary Combustion (if required)

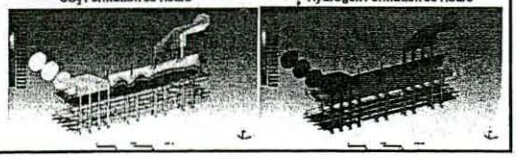
Flow and Constituents Modelling

14



CO_2 Formation 35 Hours

Hydrogen Formation 35 Hours



17 March 2011

PRESENTATION ENVIRONMENTAL:
PUBLIC INFORMATION AND PARTICIPATION MEETING
CHAR PLANT EXPANSION

exxaro
POWERING POSSIBILITY

REDUCTANTS

CONTENTS

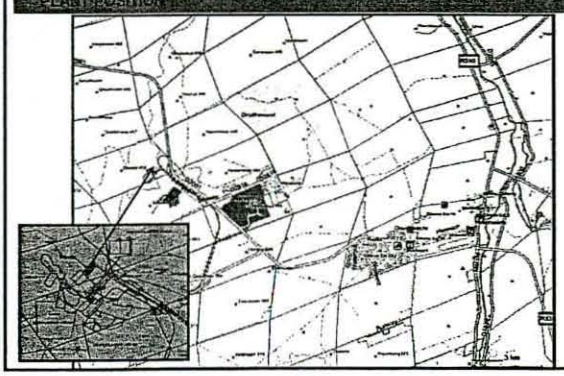
- Char Plant Location
- Reductants
- Char Market & Logistics
- Char Plant Description & Layout
- Char Plant Expansion

REDUCTANTS

- Used in the metals industry to reduce oxygen from ore to produce the basic metal
- Carbon is the fundamental component of a reductant
- FeCr industry uses a blend of Reductants namely:
  - Coke
  - Char
  - Coal
- Exxaro entered reductants market with existing char plant targeting the Ferrochrome (FeCr) market
- Good quality char can replace imported coke to some extent

SINTEL CHAR PLANT SITE

PLANT POSITION



MARKET - Ferrochrome

- Ferrochrome - Used in Stainless Steel production
- Ferrochrome vs Chrome ore export = benefit to SA economy
- Exxaro Char clients:
  - HERNIC - RUSTENBURG
  - ASSMANG - MACHADODORP
  - ASA METALS - BURGERSFORT
- Char transported by road to clients
  - Limited rail capacity from Lephalale
  - No rail offloading facilities available close to clients