

Section F 2: Infrastructure and Basic Services

Our infrastructure vision is the provision of integrated and sustainable world-class infrastructural services to all residents of Kouga in a well maintained, secured and healthy environment

Our core mandate as the institution is to:-

- (a) Supply clean , healthy and quality water services
- (b) Ensure well maintained and treated affluent services on a sustainable basis
- (c) Ensure safe , well maintained roads and storm water infrastructure services
- (d) Provide reliable, sustainable power and energy supply.

Background information for current capacity assessment

Service Delivery Performance: 2008/2009

Water services delivery strategy and main role-players:

The Kouga Municipality has met the national water services targets for basic supply of 2008 and 2010. The Municipality now needs to ensure that they provide a sustainable and cost effective service to the consumers within their area of jurisdiction. The majority of Kouga's planned water services projects will be spent on bulk developments to be able to cater for an increasing demand in water services that can be described to seasonal variations and economic growth. 100% of the planned water supply projects are bulk and 94% are bulk sanitation projects. The Municipality has developed a Comprehensive Infrastructure Plan (CIP) and close linkages are established between the WSDP process and the information included within the CIP. The availability of water resources and existing infrastructure capacity also need to be considered when planning new infrastructure.

Levels and standards in water services

All the consumers within the Kouga Municipality receive water and sanitation at or above RDP standards. The Service Level Policy of Kouga states that all consumers will have access to higher levels of services. However, this service level policy should not only consider the level of services affordable within the LM, but also the existing capacity of water services infrastructure as well as water availability.

New housing developments need to be included within the LM's service planning process. Based on the Service Level Policy of Kouga Municipality to provide higher levels of services to all, a first order cost estimated indicated that Kouga requires R65,3 million to provide house connections to all (excluding bulk) and requires R202,7 million to provide full waterborne to all households. The total requirement is estimated at R268 million. The total MIG allocation for 2009 until 2011 is R235 million. The CIP indicates a water services development requirement of R173,4 million. It is therefore of utmost importance for Kouga to consolidate their total water services requirement in order to provide a total respective on their water services needs. The main role players in water provision is seem to be the Local Municipality, the District Municipality, DWAF, and DLGTA, with the LM playing the major role. The other role-players mostly assist financially towards capacity building programmes to enhance the delivery of the planning process. "Kouga Local Municipality has a duty to all customers or potential customers in its area of jurisdiction to progressively ensure efficient, affordable, economic and sustainable access to water services. And, every WSA must prepare a draft Water Service Development Plan for its area of jurisdiction." (The Water Services Act, Act 108 of 1997).

Annual performance as per key performance indicators in water services

Indicator name	Total number of household / customer expected to benefit	Estimated backlogs	Target set for the financial year under review	Number of HH / customer reached	Percentage of achievement during the year
Percentage of households with access to potable water	100	0	0	100	100
Percentage of indigent households with access to free basic potable water	100	0	0	100	100
Percentage of clinics with access to potable water	100	0	0	100	100
Percentage of schools with access to potable water	100	0	0	100	100

Major challenges in water services and remedial actions

- i) Developing of a long term water provision master plan w.r.t. upgrading and rehabilitation of Bulk Infrastructure. A consultant has been appointed to prepare the Master Plan.
- ii) To establish contract and service level agreement with all appropriate service delivery roleplayers, i.e. Bulk Water Suppliers. Negotiations with Gamtoos Irrigation Board and the NMMM are underway w.r.t. the supply of bulk water.
- iii) Establishment of a customer service centre together with the establishment of a customer service charter. The Municipality is in the process of identifying the different roleplayers together with roles and responsibilities.
- iv) To comply in terms of the TMPS w.r.t. performance measurement against the eleven (11) National KPI's. The Municipality is in the process of compiling the infrastructure to present to DWAF before the end of October 2009 to effect our assessment.
- v) To obtain Blue Drop Certification is our major challenge. The Municipality is presently gathering all the necessary information and documentation to submit for its assessment in 2010.
- vi) To implement a water conservation / demand management strategy. The Municipality has started the process by appointing a consultant to draft Water Management Plan and the implementation thereof.

The Municipality has a considerable backlog which currently stands at 10776 housing units. This can mainly be attributed to developments in Jeffreys Bay resulting in huge influx.

Bucket eradication

The target date for bucket eradication in formal areas in Kouga was December 2007, and this target was achieved in June 2006

Sewerage

- The backlog at existing waste water treatment works need to be eradicated and capacity provided to accommodate future housing developments
- Existing bulk/connector infrastructure requires upgrading to service and accommodate the increase in effluent generated by housing developments.

Stormwater

- Kouga LM experience storm water problems in several areas within our area of jurisdiction. Flood line studies or investigations have not been done in most of the areas that are currently affected by flooding. The high cost of providing storm water infrastructure is a huge challenge in addressing situation.

1. Infrastructure Capacity Analysis

Kouga Municipality has in June 2009 appointed Kwezi V3 Consultancy to prepare an assessment report on the level of service and capacity of the existing bulk services, for the proposed developments, constraints as well as recommendations in respect requirements for the provision of bulk services to a number of housing developments areas. The 8613 new housing developments are earmarked or approved by department of Human Settlement to be for Humansdorp, Jeffreys Bay, St Francis Bay, Thornhill, Hankey and Patensie.

Kwezi V3 obtained an indication of the size of bulk services (which will still to be confirmed through preliminary and final design processes) by utilising standards and design parameters to calculate the demand and requirements for civil services in accordance with the Guidelines for Human Settlement Planning and Design compiled by the Department of Housing and Construction Technology (2000) and other approved design specifications.

1.1 Existing Bulk Infrastructure Capacity

The investigation of the demand and the provision of bulk services will be viewed within the framework of the following:

Water

A large portion of the existing and future water provision for Jeffreys Bay, Humansdorp, St Francis Bay and Thornhill is being obtained from the NMBM main supply pipes from the Churchill. Agreements between individual municipalities were signed in 1993 for small allocations in today's terms. These allocations are all largely exceeded and will leave the municipality in a precarious position should the NMBM apply the agreements in times of droughts. The agreements will be consolidated and revised, for the present and future needs, as a matter of urgency. The NMBM has recently prepared a Water Master Plan in which allowances were made for the present and future water requirements. NMBM is showing a keen interest to finalise the proposed allocations in the Water Master Plan (completed in 2007) for the provision of potable water from the bulk water schemes in an agreement with the KLM. These allocations were accepted in principle with no formal documentation prepared and signed to formalise an agreement which is now a matter of urgency. The allocation in the Master Water Plan for the NMBM are currently made for individual towns and has to be centralized for Kouga to provide the municipality the opportunity to manage the water resources to its best advantage over the area as a whole.

1.2. Service Shortage

Consolidation of the information at hand as presented below indicates clearly that the bulk infrastructure is under severe pressure

KOUGA SERVICE SHORTFALLS								
	Unit	St Francis Bay	Humans dorp	Jeffreys Bay	Thornhill	Hankey	Patensie	Remarks
Water								
Bulk Supply								
Requirement for New Development	Kl/d	1062	1514	774	236	564	196	
50% Allowance for New Development	Kl/d	531	757	387	118	282	96	A large number of people are existing consumers
Estimated Existing Consumption	Kl/d	2400	4959	8100	137	1362	1351	The Humansdorp & St Francis figures still to be confirmed
Total Required	Kl/d	2931	5716	8487	255	1644	1449	
Potentially Available 2010	Kl/d	3000	4900	9100	0	1340	1170	Allocation + Own Sources or Capacity of Works, Pumps, etc.
BALANCE	Kl/d	69	-816	613	-255	-304	-279	
KOUGA SERVICE SHORTFALLS								
	Unit	St Francis Bay	Humans dorp	Jeffreys Bay	Thornhill	Hankey	Patensie	Remarks
Reservoirs								
Required	Kl	5862	11432	16974	510	3288	2898	
Available capacity	Kl	8000	6200	19000	109	4050	3600	
BALANCE	Kl	2138	-5232	2026	-401	762	702	
Sewerage								
Flow from New Development	Kl/d	710	1057	529	162	297	120	
Estimated Existing Flow	Kl/d	620	3400	4300	60	600	724	These figures are calculated estimates.
Total Required	Kl/d	1330	4457	4829	222	897	844	No allowance for existing properties.
Existing Capacity	Kl/d	750	3700	0	145	1000	0	The Jeffreys Bay & Hdorp works needs to be replaced in total .
BALANCE	Kl/d	-580	-757	-4829	-77	103	-844	

1.3 Alternative Water Source: Ground Water Study

The municipality with the experienced water shortages is opting to pursue the option of underground water supply. The municipality will engage the services of a ground water specialist to investigate the feasibility of the development of a groundwater source to the north of the R102. Traditionally, groundwater resources for municipal supplies are only assessed within a relatively small radius of cities/towns because of logistical and economical factors associated with pumping large distances. A report prepared for the Water Research Commission, dated January 2008, indicates excellent opportunities for ground water extraction in the area to the north of the R102 from Jeffreys Bay in a westerly direction to a position well west of Humansdorp.

This study presents major aquifers and potential drilling target areas within an economically acceptable distance of existing water supply infrastructure. High-yielding groundwater areas for the Kouga Municipality can be gained if it is successful in acquiring substantial water quantities from these groundwater sources. It may put the municipality in the position to trade water from the Elandsjacht and Churchill sources for additional allocation.

Potential targets: Jeffreys Arch

The general criteria required for targeting high yielding boreholes in the Jeffreys Arch Domain appear to be the following:

1. Anticlinorium in this area are composed of numerous secondary anticlines and synclines. The changes in fold limb orientations increase permeability and can increase groundwater residence time.
2. High coastal recharge area & much exposed fractured bedrock in recharge area, with a thin soil cover.
3. The drilling target areas must be well jointed and fractured. In Domain 1 NE-SW jointing dominates, but subordinate site-specific N-S and E-W joints should also play a role in groundwater flow.
4. Possible deep Table Mountain Group (TMG) structural targets under Cretaceous basin fill at the extreme SW margin.

Estimated groundwater resource potential

Area	860 km ²
Existing use ¹	1.2 Mm ³ /a
Recharge (normal years)	22.1 Mm ³ /a
Recharge (dry years)	16.0 Mm ³ /a
Contribution to river base flow	11.4 Mm ³ /a
Harvest Potential	46.0 Mm ³ /a
Groundwater Resource Potential (normal years)	15.5 Mm ³ /a
Groundwater Resource Potential (dry years)	8.8 Mm ³ /a
Groundwater Exploitation Potential (normal years)	5.7 Mm ³ /a
Groundwater Exploitation Potential (dry years)	3.3 Mm ³ /a
Borehole yield without artificial recharge and continuous abstraction (~20 boreholes)	5 Mm ³ /a
Borehole yield with artificial recharge and 6-month/a abstraction (>20 boreholes)	7.5 Mm ³ /a

Highlighted areas in order of priority

1. Plunging anticlinorium. Target synclines first.
2. Intersection of quartzitic sandstone syncline / anticline structures and the dominant NESW joint system. Geological evidence suggests the presence of artesian water.
3. Target Areas 3 & 4: Secondary anticlines and synclines. Target the synclines and change in bedding dip in combination with the dominant fracture system. Target Area 4 could be extended towards Humansdorp and Kruisfontein, should similarities with Target Area 2 be found.

Potential targets: Gamtoos

The high groundwater potential areas in the Gamtoos Basin (Figures 5 and 6) appear to be:

1. The Gamtoos boundary fault and associated faulting (largely unmapped).
2. The buried gravel terraces of the Gamtoos River.
3. The coarser-grained sand horizons in the upper Enon – lower Kirkwood Formations.
4. Seepage water at the base of the Tertiary and Quaternary cover sediments.
5. Possible fault-related lineaments in the basin – provided they are not clay-rich faults.

Area	642 km ²
Existing use ¹	0.2 Mm ³ /a
Recharge (normal years)	21.6 Mm ³ /a
Recharge (dry years)	15.6 Mm ³ /a
Contribution to river base flow	24.7 Mm ³ /a
Harvest Potential	6.4 Mm ³ /a
Groundwater Resource Potential (normal years)	17.2 Mm ³ /a
Groundwater Resource Potential (dry years)	11.0 Mm ³ /a
Groundwater Exploitation Potential (normal years)	9.6 Mm ³ /a
Groundwater Exploitation Potential (dry years)	6.1 Mm ³ /a
Borehole yield without artificial recharge and continuous abstraction (~20 boreholes)	2.5 Mm ³ /a
Borehole yield with artificial recharge and 6-month/a abstraction (>20 boreholes)	3.75 Mm ³ /a

Employed strategy for establishing the true groundwater potential is as follows:

1. Deciding on the minimum annual groundwater yield that makes groundwater development worthwhile, taking into consideration yield, the value of an assured supply to meet seasonal peak demands and the value of a back-up to surface water.
2. Identify one or two hydro-geological domains to undertake pilot studies.
3. Identify prime drilling target areas by undertaking a detailed remote sensing study of these areas and by obtaining on-the-ground information.
4. Assess the groundwater potential in about five of the prime target areas after undertaking an environmental study of these areas. This would require drilling and borehole testing (pumping) as well as a Basic or more detailed environmental study.
5. Put the prime areas into production and monitor groundwater and environmental effects of abstraction.
6. Repeat this process with new areas, and consider artificial recharge as a means to increase the assured yield or a means to provide additional supplies during summer months.

1.4 Water Demand Management

Alternative water supply methods such as water demand management, rain water harvesting etc must be investigated and implemented if feasible.

Estimated Water Demand

The water requirements were based on the following consumption estimates for the different categories of development. It has been accepted that business zoning will have coverage of 70% and institutional and local authority will have 30% coverage.

LAND USE	Unit	Consumption □/unit/day
High Density - General Res	Residential Opportunity	450
High Density - Single Res	Residential Opportunity	500
Single Res	Residential Opportunity	650
Single Res - Low Density	Residential Opportunity	800
Business	/100 m ² of building area	400
Institutional	/100 m ² of building area	400

One or two of the projects can proceed with some minor interventions, it is quite clear that the KLM needs to embark on a challenging program to upgrade its bulk services infrastructure to a level where it can provide the services as expected by its residents. The proposals hereunder are not final solutions but merely an indication of sensible routes to follow to achieve the desired results. Where costs are mentioned it should not even be considered for budget purposes but it will provide an idea of the magnitude of the intervention that is needed to rectify the situation.

□ Sanitation

The quality of effluent from a waste water treatment works (WWTW) is regulated by the new Water Services Act (2000). Kouga as a Water Services Providers (WSP), adhere to the requirements of the Act. Pollution of public water sources i.e. dams, rivers and streams by allowing effluent that does not conform to the requirements of the Act, is a transgression of the law and the council and officials can be legally prosecuted. The ability of a WWTW to deliver an effluent that can adhere to the quality requirements has been utilised to determine the sufficiency of the WWTW's.

□ Solid Waste

In terms of the Environmental Conservation Act of 1989 all Solid Waste Disposal Sites (SWDS) need to be operated within the guidelines as stipulated. These guidelines require that sites should be approved and licensed. The capacity of a site depends on factors included in the license i.e. provision of linings, drainage, coverage, etc. The adherence to these requirements of the two approved waste disposal sites in the Kouga area, Humansdorp and Hankey, as the norm to determine the capacity of the site. All waste being generated in the area of the Kouga Local Municipality is being disposed of at one of these two sites. The existing capacity of this site is limited and new cells with additional capacity will have to be provided urgently

1.5 Service Requirements

It is problematic to calculate the requirements for these developments with a high degree of confidence. Kwezi V3 claims that the majority of beneficiaries for these developments are people who are already staying in the area and making use of the services at the moment. Although it is possible to do a reasonable estimate of the requirements for the new housing development it is difficult to determine the existing consumption and thus calculating the additional requirements. For the purpose of this report it is accepted that 50% of the estimates calculated for the developments will be additional requirements. That should be sufficient to allow for the increase in per capita water consumption and for additional people that will enter into the developments.

WATER & SEWAGE REQUIREMENTS SUMMARY		
TOWN	WATER	WASTE WATER
	Kl/day	Kl/day
St Francis Bay	1062	710
Humansdorp	1514	1057
Jeffreys Bay	774	529
Thornhill	236	162
Hankey	564	577
Patensie	196	120

Analysis of Water and Sewerage Requirements

WATER & SEWAGE REQUIREMENTS											
SEA VISTA – WARD 1										WATER	WASTE WATER
STAND TYPE	ALL STANDS SQM	TYPICAL MIN STAND AREA	APPROX. STAND COUNT	AMOUNT OF OPPORTUNITIES	FLOOR FACTOR	GROSS AREA	UNIT	AVERAGE DAIL CONS. PER UNIT	K ℓ/day	AVERAGE DAILY FLOW. PER UNIT	Kℓ/day
Total Daily Average									1062		710
High Density - General Res	22631		5	113	0.9	20368	ℓ/ Opportunity	400	45	320	36
High Density – Single Res	284675	180.0	1475	1475	0.6	170805	ℓ/ Opportunity	450	664	315	465
Single Res	149625	500.0	285	285	0.5	74813	ℓ/ Opportunity	500	143	300	86
Single Res – Low Density	72666	750.0	99	99	0.4	29066	ℓ/ Opportunity	800	79	400	40
Business	6143	900.0	3	3	0.7	4300	ℓ/100 m ² Floor Area	400	17	360	15
Institutional	95013		8	9	0.3	28504	/100 m ² Floor Area	400	114	240	68
KRUISFONTEIN – WARD 4											
Total Daily Average									1233		864
High Density - General Res	570900	182.0	2226	2226	0.6	342540	ℓ/ Opportunity	450	1002	315	701
Business	28900		11	11	0.7	20230	ℓ/100 m ² Floor Area	400	81	360	73
Authority	5000		1	1	0.3	1500	ℓ/100 m ² Floor Area	400	6	240	4
Institutional	120600		14	14	0.3	36180	ℓ/100 m ² Floor Area	400	145	240	87
ARCADIA – WARD 5											
Total Daily Average									79		52
High Density - General Res	15851	130.0	117	117	0.6	9511	ℓ/ Opportunity	450	53	315	37
Single Res	3230	180.0	17	17	0.5	1615	ℓ/ Opportunity	500	9	300	5
Institutional	14612		3	3	0.3	4384	ℓ/100 m ² Floor Area	400	18	240	11

WATER & SEWAGE REQUIREMENTS											
KWANOMZAMO – WARD 6										WATER	WASTE WATER
STAND TYPE	ALL STANDS SQM	TYPICAL MIN STAND AREA	APPROX. STAND COUNT	AMOUNT OF OPPORTUNITIES	FLOOR FACTOR	GROSS AREA	UNIT	AVERAGE DAIL CONS. PER UNIT	Kℓ/day	AVERAGE DAILY FLOW. PER UNIT	Kℓ/day
Total Daily Average									202		140
High Density – Single Res	109302		362	362	0.6	65581	ℓ//Opportunity	450	163	315	114
Single Res	16024		36	36	0.5	8012	ℓ//Opportunity	500	18	300	11
Business	2850		1	1	0.7	1995	ℓ/ 100 m² Floor Area	400	8	360	7
Institutional	10559		5	5	0.3	3168	ℓ/ 100 m² Floor Area	400	13	240	8
WESTON – WARD 7											
Total Daily Average									69		48
High Density – Single Res	38250		153	153	0.6	22950	ℓ/Opportunity	450	69	315	48
THORNHILL – WARD 7											
Total Daily Average									236		162
High Density – Single Res	68940	180.0	383	383	0.6	41364	ℓ//Opportunity	450	172	315	121
Business	4163		1	1	0.7	2914	ℓ/ 100 m² Floor Area	400	12	360	10
Authority	10435		1	1	0.3	3131	ℓ/ 100 m² Floor Area	400	13	240	8
Institutional	33076		2	2	0.3	9923	ℓ/ 100 m² Floor Area	400	40	240	24
OCEAN VIEW – WARD 8									WATER	WASTE WATER	
Total Daily Average									774		529
High Density – Single Res			1334	1334	0.6	0	ℓ//Opportunity	450	600	315	420
Single Res			84	84	0.5	0	ℓ/ 100 m² Floor Area	500	42	300	25
Business	6143	900.0	3	3	0.7	4300	ℓ/ 100 m² Floor Area	400	17	360	15
Institutional	95013		8	9	0.3	28504	ℓ/ 100 m² Floor Area	400	114	240	68
HANKEY – WARD 9											
Total Daily Average									495		297
Single Res			990	990	0.5	0	ℓ/Opportunity	500	495	300	297
Single Res – Low Density					0.4	0	ℓ/Opportunity	800	0	400	0
Business					0.7	0	ℓ/ 100 m² Floor Area	400	0	360	0
Institutional					0.3	0	ℓ/ 100 m² Floor Area	400	0	240	0
OCEAN VIEW – WARD 8											
Total Daily Average									196		120
Single Res	44414		278	278	0.5	22207	ℓ/Opportunity	500	139	300	83
Business	2697		3	3	0.7	1888	ℓ/ 100 m² Floor Area	400	8	360	7
Institutional	40820		3	3	0.3	12246	ℓ/ 100 m² Floor Area	400	49	240	2

1.6 COST ESTIMATES: UPGRADING OF BULK SERVICES PRELIMINARY

TOWN	WATER			WASTE WATER			SOLID WASTE		
	Description	Backlog	Project	Description	Backlog	Project	Description	Backlog	Project
Kouga	Formalise Water Agreement with NMBM	R200-000		Investigate the establishment of a Regional WWTW	R350-00		Implement recommendations as per KV3 Master plan at Humansdorp & Hankey	R10-400-000	
	Perform Groundwater Study for JBay, H/Dorp & St Francis (Desktop)	R300-000							
	Perform Geohydrological Study JBay, H/Dorp & St Francis (Drill, Test & Quantify)	R1-500-000							
	Water Demand Management Study	R1-200-000							
	TOTAL	R3-200-000	R0		R350-000-00	R0		R10-400-000	R0
St Francis Bay	Evaluate existing Groundwater potential	R500-000		Construct additional 750 kl/d module at WWTW	R 2-000-00	R300-000-000	Establish a Waste Transfer Station	R 1-700-000	R300-000
	Rehabilitate existing Borehole Installations	R1-000-000		Construct & Upgrade P/Station, R/Main & Outfall		R 2000-000	Contribute to Augmentation of Regional Solid Waste Site		R 2000-00
	Drill & Equip New Boreholes		R 1-000-000						
	Construct 2 MI Reservoir		R 2500-000						
	TOTAL	R 1-500-000	R 3-500-000		R 2-000-000	R 5000-000		R 1-700-000	R 2-300-000
Humansdorp	Evaluate existing Groundwater potential	R 500-000		Acquire Land, Approvals & ROD (EIA) for Regional WWTW	R 3000-000		Contribution to Augmentation of Regional Solid Waste Site		R 3-100-000
	Rehabilitate exiting Borehole Installations	R 500-000		Establish 7 MI WWTW	R 40-000-000	R 15-000-000	Establish a Waste Transfer Station	R 1-700-000	R 3000-000
	Augment and Rehabilitate Water Treatment Works	R 4000-000	R 2-000-000	Outfall Sewers, Pump Stations & Rising Mains	R 10-000-000				
	Drill & Equip New Boreholes		R 1-000-000						
	Construct 2 MI Reservoir								
	TOTAL	R 10-000-000	R 6-000-000		R 53-000-000	R 15-000-000		R 1-700-000	R 3-400-000
Jeffreys Bay	Complete Connection to Churchill Pipeline	R 500-000		Construct 7,5 MI WWTW	R 40-000-000	R 5-000-000	Establish 2 solid Waste Transfer Stations	R 4-000-000	

	Existing Groundwater Potential	R 500-000		Upgrade Pump Stations & Rising Mains	R 8-200-000		Contribute to Augmentation of Regional Solid Water Site		R 1-700-000
	Augment & Rehabilitate Water Treatment Works		R 3-500-000						
	Construct New 4 MI Reservoir		R 3-500-000						
	TOTAL	R19-000-000	R 7-500-000	TOTAL	R 48-200-000	R 6-800-000	TOTAL	R 4-000-000	R 1-700-000
Thornhill	Upgrade Water Connection from Summit Pipeline	R 8-00-000	R 250-000	Augment WWTW to 500Kl/d	R 2-000-000	R 1-000-000	Contribute to Augmentation of Regional Solid Waste Site		R 200-000
	Construct 1500 KI Reservoir & Booster Pump Station	R 1-500-000	R 1-000-000						
	TOTAL	R 2-300-000	R1-250-000	TOTAL	R2-000-000	R 1-000-000	TOTAL	R0	R 200-000
Hankey	Investigate Additional Water Supply Options	R 3-00-000		Augment WWWTW to 1,7 MI/d		R 5-000-000	Contribute to Augmentation of Regional Solid Waste Site		R 200-000
	Reposition & Construct Extraction from Klein River	R 2-000-000	R 500-000	Upgrade Pump Station		R 500-000			
	Provide 500 KI Reservoir		R 1-000-000	Const P/Station & R/main from Weston to WWTW		R 1-500-000			
	Improve bulk supply to new Reservoir in Weston	R 500-000	R 500-000						
	Augment & Rehabilitation Water Treatment Works	R 3-000-000	R 1-000-000						
	TOTAL	R 5-800-000	R 3-000-000	TOTAL	R0	R 7 000-000	TOTAL	R0	R 200 000
Patensie	Investigate Additional Water Supply Options	R 300 000		Construct New 375 KI/d WWTW	R 7 500-000	R 1 500 000	Contribute Augmentation of Regional Solid Waste Site		R 300 000
	Geohydrological Study & Ground Water Development	R 1 500-000	R 500-000	Pump Station & Rising Main	R 5 000-000	R 2 700-000			
	Construct 2000 KI Reservoir	R 1 800-000	R 3 000-000	TOTAL	R 12 500-000	R 4 200-000	TOTAL	R0	R 300 000
	GRANT TOTALS		R 43 600-000		R 24 250-000	R 118 050-000			R 17 800-000

1.7 Regional Waste Water Treatment Works

The existing WWTW at Jeffreys Bay is virtually condemned by the ROD that was issued for the augmentation of the works. Although the available land at the existing site is more than adequate, a large area of land is sterilised by the buffer zones imposed by the Department of Health. New developments are now surrounding the plant completely and the Municipality will be continuously under great pressure to move the facility from its current location.

Both the existing Humansdorp WWTW sites are not acceptable. Informal housing has encroached to within metres of the Kwanonzamo reactor and formalised housing units are less than a hundred metres away. The site at Kruisfontein is situated approximately 300 metres south-west from the nearest houses. Notwithstanding the environmental and health issues that exist where a WWTW is situated in the dominating wind direction it appears as if the area near the Kruisfontein WWTW may also be the preferred direction for future development.

1.8 SUBSIDISED HOUSING DEVELOPMENT VS BULK AND INTERNAL SERVICES

Waste Water Treatment Works

The WWTW at St Francis Bay is situated within 2 km from the sea and the value of land so close to the sea can never be over-estimated. The above mentioned realities and the advantages of economy of scale and centralised operations emphasise the necessity to investigate the possibility of a centralised regional WWTW for Jeffreys Bay, Humansdorp and Cape St Francis.

Solid Waste Sites

KV3 engineers recently prepared an Integrated Waste Management Plan for the KLM and the final document was adopted by Council in November 2008. The proposal as described in that document entails a number of actions that needs to be performed to ensure that the Council can provide an effective service. As was stated in Item 4 above, a large portion of the potable water supply to the KLM originates from the NMBM supply and that the agreements regulating this supply are badly outdated. The NMBM indicated that they are eager to have this investigated and updated urgently to ensure that there are approved and agreed decisions in place that are binding on both parties.

The proposals as presented in this report are in essence not much more than an action plan to assist to prepare itself to provide adequate bulk services to the communities . A few of the proposals as presented in have already been partially addressed through involvement of engineers and other actions but the largest number of them needs to be pursued aggressively. The primary purpose of this report was to identify the obstacles and shortcomings with the delivery of bulk services and to make proposals to assist the Kouga to proceed with its housing implementation plans without delay. The estimates as being forwarded in referred to in the Cost Estimates table were prepared without detail planning and are little more than giving an order of magnitude for the implementation of the initiatives and can be summarised as follow:

Backlog and Current Capacity for the Housing Development

Backlog and rehabilitation		Capacity for Proposed Development	
Water	R 43 600 000	Water	R 24 250 000
Sewerage	R 118 050 000	Sewerage	R 39 000 000
Waste Disposal	R 17 800 000	Sewerage Solid Waste	R 8 100 000
GRAND TOTAL			R 250 800 000

Three (3) Year Plan to Electrify New Sub-Economic Houses

Below is a preliminary report on the proposed measures and funding necessary to upgrade the existing bulk infrastructure and to establish the internal reticulation network together with the house service connections and internal installation to complete the electrification of the proposed new residential areas in Jeffreys Bay, Humansdorp and St Francis Bay over the next three (3) years.

The 6 552 houses to be connected are in:

- Ocean View at Jeffreys Bay consisting of 1 720 houses.
- Kwanomzamo (193 houses) and Arcadia (2 639 houses) at Humansdorp.
- Sea Vista at St Francis Bay consisting of 1 615 standard houses and 385 Breaking New Ground (BNG) houses.

These areas fall within the supply area of the Municipality and is located where the main supply at Medium Voltage (MV- 11 or 22kV) can be readily made available from the existing bulk infrastructure.

This report does not cover approximately 2 000 new houses to be built in Hankey, Patensie and Thornhill. Hankey and Patensie fall within the supply area of Eskom and Thornhill under the Nelson Mandela Bay Municipality where these authorities will be responsible for the electrification of the houses as was done in the past.

Below is the summary of the KVA demand and bulk infrastructure and internal reticulation costs for each area to be developed, and notes on the bulk infrastructure upgrade measures required, the costs thereof as well as the internal reticulation costs, the funding sources and the basis for the cost estimates.

Area	SE & BNG HOUSES			BULK INFRASTRUCTURE COST			INTERNAL RETICULATION COSTS				
	NO OF HOUSES		ADMD (kVA)	Total kVA	Total Cost	DME Funding	Kouga Counter Funding	Cost per House	Total Cost	DME Funding	Kouga Counter Funding
	SE	BNG									
Ocean View	1 720		1,5	2 580	R6,91 m	R6,91 m	Nil	R6 700	R11,5 m	R9,46 m	R 2,04 m
K'Nzamo	193		1,5	290	R2,34 m	R2,34 m	Nil	R7 000	R 1,35 m	R1,06 m	R 0,29 m
Arcadia	2 639		1,5	3 960	R9,15 m	R9,15 m	Nil	R6 600	R17,4 m	R14,5 m	R 2,9 m
Sea Vista	1 615		1,5	2 425	R8,25 m	R8,25 m	Nil	R 6 500	R10,5 m	R 8,9 m	R 1,6 m
		385	2,5	965				R10 500	R4,04 m	R 2,12m	R 1,92 m
TOTAL	6 167	385		10 220	R26,65 m	R26,65 m	Nil		R44,79 m	R36,04 m	R 8,75 m

As can be seen from the kVA demand figures given in the table, these developments will require a substantial increase in the Eskom notified demand at Jeffreys Bay, Humansdorp and St Francis Bay. In the present climate where Eskom is experiencing a supply shortage problem (mainly in generation) this could lead to there not being enough power available for these developments. Eskom will have enough time to address its problems.

It is expected that, as was the case in the past, most of the funding will come from the Department of Minerals and Energy (DME). At least once a year an application to DME for funding and has so far been successful in all instances, which include internal reticulation as well as bulk infrastructure upgrading work. In the case of bulk infrastructure upgrade, 100% of the amount required is normally granted, but for the internal reticulation a fixed amount per house is granted, which is normally less than the amount required.

From the table it can be seen that the estimated internal reticulation cost for a standard house varies between R6 500-00 and R7 000 per house, whereas the present amount (2009/10) received from DME is R5 500-00/house. Counter funding will therefore be in this case required from the Municipality, which will be higher for the BNG houses where the cost per house is estimated at R10 500

The rate of R5 500-00/house is reviewed each year by DME to take escalation into account. It is to be noted that funding from DME is not guaranteed and a concerted effort is required each year to secure same. A negative aspect is that DME now requires the houses to be completed before an application can be made. This is not practical since owners expect the houses to be provided with electricity they move in. Another negative aspect is that it often happens that the internal reticulation is completed before the houses are completed or the areas where the houses are to be built are changed midway through the construction of the internal reticulation. This sometimes results in the electrification not being completed in the time frame given to DME, which

makes the department reluctant to provide funding the next year. The level of the services required for the BNG houses still needs to be determined. Judging by the sizes of the erven these will be more upmarket houses and therefore we allowed a higher demand per house and underground MV reticulation and service connections, whilst the Low Voltage (LV) reticulation is to be overhead as in the case for the sub-economic houses. No allowance has been made for street/area lighting as this is not included, in the funding parameters set by DME. This can, however, be installed using MIG funds.

All cost are based on present day prices with no allowance for escalation. Allowance for escalation can be made at 1% per month. The number of houses given in the table are those that fall within the Kouga Municipal supply area and not those in the Eskom supply area ($\pm 2\ 000$). The funds from DME for Internal Reticulation Costs are based on a rate of R5 500-00/house, which is the rate for 2009/10. This amount is adjusted every year to allow for escalation. It is not guaranteed that funding will be received from DME every year for both Infrastructure and Internal Reticulation Costs. Clinkscales Maughan-Brown is on a regular basis applying on behalf of the Municipality to DME for funding.

Challenges

The main challenges to make this project work from an electrical perspective are as follows:

- (i) To complete the houses timeously and meeting the DME requirements
- (ii) For Eskom to meet the additional load requirements, which will be imposed at each towns bulk supply point.
- (iii) Funding and a cash flow programme which will meet the infrastructure upgrading and internal reticulation expenditure requirements.
- (iv) Availability of counter funding from the Municipality.
- (v) Evaluate the BNG housing requirements and having adequate funding in place to meet this higher standard.

The following measures are considered to meet these challenges:

- (i) Setting-up a planning team to effectively co-ordinate the building and engineering services and work from a master plan prepared by the same team.
- (ii) Meet with DME to formulate a strategy to meet its requirements, but being practical in terms of the house and Municipal programme requirements.
- (iii) Eskom must be timeously advised of the increase in notified demand and be made aware of the house owners and Municipal programme requirements.
- (iv) Demand side management measures in implemented by the Municipality to reduce the peak kVA demand and kWh consumption (energy saving) at each of the Eskom supply points.
- (v) The expenditure programme needs to be well co-ordinated with the timing of the funding from DME, MIG and the municipal budget.
- (vi) Counter funding from the Municipality could be enhanced through a special electrification levy. It is important that there is a long term plan in place.
- (vii) The services requirements of the BNG housing need to be evaluated by the planning team mentioned above.

The Road Ahead

Recommended for action by the service providers is the following course of action:

- (i) A workshop to be held to determine the main focus areas, attended by the relevant officials and Councilors of the Municipality and Consultants presently involved in Engineering and Town Planning projects for the Municipality.
- (ii) A planning team to be set-up. The terms of reference, particulars and budget can be determined at the workshop mentioned above.
- (iii) The first requirement for the planning team should be to prepare a master plan together with costs and to submit the final report to Council for approval.
- (iv) Meet with DME. This is of extreme importance since nearly all the funds for the electrification programme could be obtained from this Department.

Electricity Service

Electricity services delivery strategy and main role-players:

The Municipality is the registered Supply Authority for Humansdorp, Jeffreys Bay, St Francis Bay, Cape St Francis and Oyster Bay, where at each town a bulk supply is taken from the Eskom grid. The Municipality's role is to construct, operate, and maintain the distribution network for electricity service delivery to residential, commercial and industrial consumers in each township, which includes street lighting and supplying pump stations, etc. Hankey, Patensie, Loerie and Thornhill also fall within the municipal boundaries, but consumers in the first three (3) towns are serviced with electricity by Eskom, and Thornhill by the Nelson Mandela Bay Municipality. The Electrical Department is headed by the Manager Electro-Technical Services, supported by three (3) Area Engineers with offices in Humansdorp, Jeffreys Bay and St Francis Bay.

Their role in addition to planning is to manage the electricians and other staff responsible for the day to day operation of the electricity network and related construction work. The key factors in the service delivery strategies are to maintain a high standard of service and to ensure that electricity is available to all commercial properties, households (both formal and informal) and new developments within acceptable norms. In order to reduce the financial burden on consumers, particularly in terms of the capital requirements for new distribution networks, applications are made to all relevant institutions for financial assistance in a well planned manner.

The present consumer quantities are

Town	Indigent households	Other households	Commercial / industrial	Totals
Humansdorp	3 137	1 649	371	5 157
Jeffreys Bay	1 678	7 172	619	9 469
St Francis Bay	352	1 451	93	1 896
Cape St Francis	0	499	7	506
Oyster Bay	52	224	10	286
Totals	5 219	10 995	1 100	17 314

Jeffrey's Bay = 66KV connection	Humansdorp = 22 KV connection	Cape St Francis = 22KV	Oyster Bay = 22KV connection
Total max. demand = R32 MVA Usage max. demand = 24 MVA Spare capacity = 8MVA	Total max. demand = 12MVA Usage = 10 MVA Spare capacity = 2MVA	Total max demand = 5,5KVA Usage max. = 6KVA Spare capacity = None	Total max. demand = 9KVA Usage max. = 8KVA Spare capacity = 1KVA

Level and standards in electricity services

The aim is for the levels and standards for the provision of the electricity services to be in compliance with the requirements of the National Electricity Regulator (NER) and the quality of service and supply standards of NRS 047 & 048. Annual reports in this regard have to be submitted to the NER based on information obtained from data loggers installed at various locations in the network. Electricity is made available to all potential consumers in the areas for which the Municipality has a supply license.

The target set by the Housing Department for the electrification of low cost housing / indigent households has been met. The target is revised annually in accordance with the demand and the necessary steps are taken to timeously complete the work. This includes applications to the Department of Minerals and Energy (DME) to obtain the necessary funding for both electrification and infrastructure upgrade. So far the Municipality has a 100% success record in meeting the requirements of DME and the targets set. MIG funding is used for the provision of area / street lighting in low cost housing areas.

Annual performance as per key performance indicators in Electricity services

Indicator name	number of household / customer expected to benefit	Estimated backlogs	Target set for the financial year under review	Number of HH / customer reached during the financial year	Percentage of achievement during the year
Percentage of households with access to electricity services	100% *	500 IH only	500 IH only	500 IH only	100% IH
Percentage of indigent households with access to free electricity services	100% *	500	500	500	100%
Percentage of clinics with access to electricity services	0%	0	0	0	0

IH Indigent households

**Total of 16 214 households of which 5 219 are indigent.*

d) General Major Challenges in Electricity Services

•	Upgrade of infrastructure (primary network) to meet demand and finding the necessary funds through grants, etc.
•	Improve quality of supply and general service delivery.
•	Training of staff.

Remedial Actions

•	Master planning and stringent programs to implement upgrading measures.
•	Review of Augmentation Levy (contribution by new developments and existing consumers requiring upgrading of their supplies to augment the primary network) and consumption tariffs to meet capital program to upgrade infrastructure.
•	Appoint additional staff to monitor quality of supply and level of services, and enforce methods to rectify any deficiencies.
•	Staff to attend more training courses and to improve in-house training, particularly on safety aspects.

Alternative Energy

1. Jeffreys Bay Wind Project

The Eastern Cape Province is reliant on electricity imports from other provinces yet houses significant industrial and rural development potential. Power is transmitted considerable distances to the Eastern Cape (e.g. from Mpumalanga), which leads to significant transmission losses and local grid instabilities. In the Kouga region, secondary agricultural processing companies, both small and commercial scale farmers, currently experience an intermittent and sometimes unreliable supply of electricity. The current situation limits the economic growth potential in the Kouga area as some existing industries are considering moving elsewhere, and new industries are inhibited from developing because of the lack of an adequate and reliable electricity supply.

The Kouga municipal area electricity supply to this area is currently unreliable and the area experiences energy instabilities such as voltage fluctuations and frequent outages. Given these challenges, one ultimate goal is to help stabilise energy supply to the Kouga area, and thereby to assist the local economy in developing a greater degree of energy security, especially for emerging entrepreneurs in the area. The type of grid instability in this case can be easily corrected with the use of local generation. An energy generation project activity in the Kouga area would assist in rectifying this situation. Mainstream Renewable Power Jeffrey's Bay (Pty) Ltd is proposing the construction of a wind energy facility near Jeffrey's Bay Wind Farm Project. This project would utilise wind turbines with a combined generation capacity of a maximum of approximately 16 MW proposed by Genesis Eco-Energy and for which an environmental authorisation was obtained in March 2009.

The project objective is therefore twofold:

- (i) Meet our national renewable energy and climate change targets
- (ii) and to meet our energy shortage by providing additional generation capacity for export via the grid to surrounding areas of the Eastern Cape, such as the Nelson Mandela Metropole and further.

A separate Basic Assessment (Department of Environmental Affairs Reference number: 12/12/20/1748) is in process for the establishment of wind monitoring masts on the Jeffrey's Bay site prior to the development of the wind farm. The monitoring masts would have a maximum height of 100 m.

Project Potential

The local wind climate creates potential for a wind energy project to generate electricity in the Jeffrey's Bay area, thereby contributing towards the provision of sustainable renewable energy. This led to Genesis Eco-Energy (Pty) Ltd who joined forces with Mainstream Renewable Power to form Mainstream SA, initiating a pre-feasibility study in 2005 on the potential for a hybrid wind energy and pumped storage project in the Kouga area. The overall results of the study were positive. However, cost implications of the pumped storage component proved to be prohibitive and only the 16 MW wind energy component was taken into the Environmental Impact Assessment (EIA) phase. Authorisation for this 16 MW project was provided by the Eastern Cape Department of Economic Development and Environmental Affairs in March 2009.

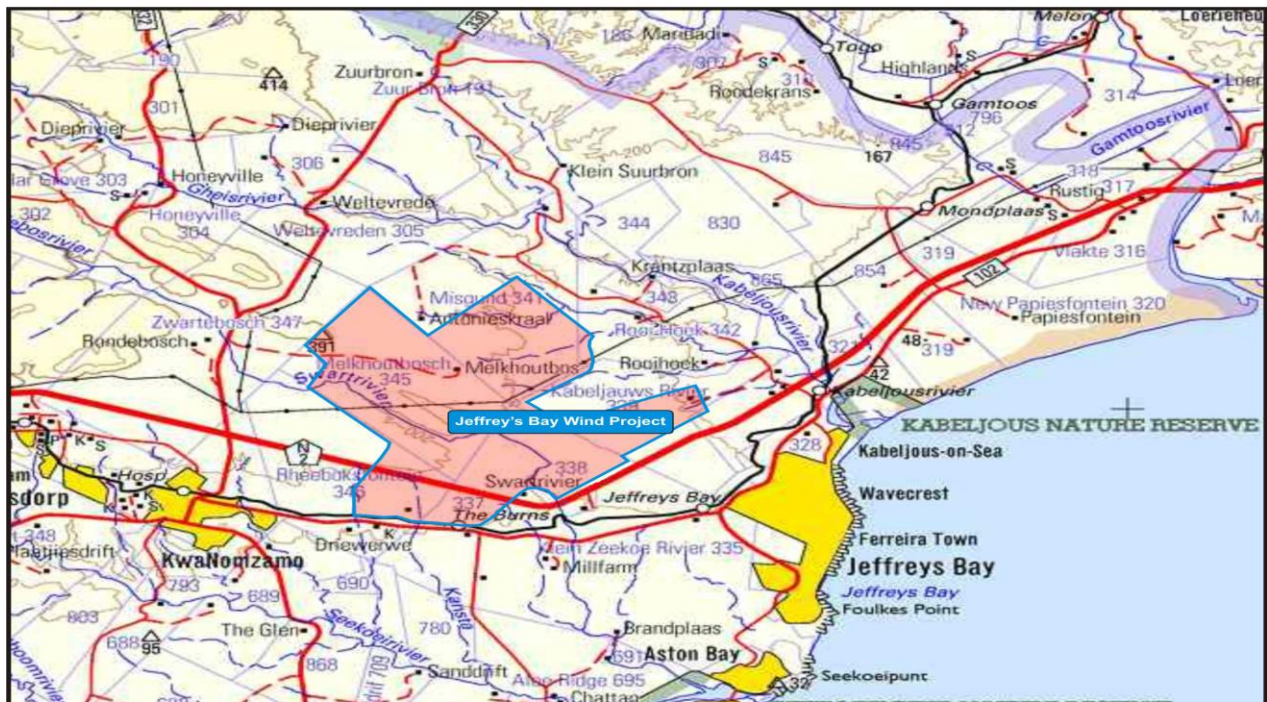
During the pre-feasibilities stages of the project, representatives of the World Bank Carbon Fund were involved with the identification of possible alternative designs and sites. They have indicated that the project has merit and would qualify for carbon

credits once operational. Furthermore, this project complies with the Clean Development Mechanism (CDM) of the Kyoto Protocol of 1997, whereby a First world country can purchase certified emission reductions from a clean energy project in a developing economy such as South Africa. (CSIR, February 2010 pg 1-2 Environmental Impact Assessment: Jeffrey's Bay Wind Project Draft Scoping Report)

Location of the Project

The Jeffrey's Bay Wind Project is proposed near Jeffrey's Bay within the Kouga municipal area. The facility is proposed on the coastal plateau inland of the towns of Humansdorp and Jeffreys Bay, at an elevation of approximately 160 m to 220 m above sea level. The facility will cover several farms, the majority of which are located immediately inland of the N2 highway. The facility will be accessed along one of three possible gravel access roads that will be upgraded, if it is an existing road, or otherwise constructed for the development. In terms of proximity to residential areas, the most eastern point of the study area is approximately 5km north-west from the closest inhabited residential area of Wavecrest, at Jeffrey's Bay.

Jeffrey's Bay Wind Project



The project will extend across the following farms (original registered farm names are provided):

- Sunnyside Farm, The Remainder of Farm 895;
- Melkhoutbosch (SimSo Simmentalers), Portion 4 and 9 of the Farm Melkhoutbosch No 345
- Padplaat, Portion 2 of the Farm Kabeljauws River No 339
- The Burns, The Remainder of the Farm Klein Zeekoe Rivier No 337
- Dike Fatman Cooperative Farmers Trust, Portion 5, 6&8 of the Farm Melkhoutbosch No 345
- Remainder of Farm Rheeboekfontein No 346, Portion 2 of Farm Melkhoutbosch No 345

- Remainder of Portion 3 of Farm Klein Zeekoe River No 337

Project description

The key components of the project are:

Wind turbines

- 40 to 85 turbines (number dependent on capacity of turbines selected in the range between 1.5 and 3 MW), with an expected hub height in the range 60 - 100 m and a blade diameter in the range 70 m to 120 m.
- Turbines to be supported on reinforced concrete foundations of size anticipated to be maximum 20m x 20m x 2.5 m depth.
- Electrical transformers will be placed beside each turbine.
- Gravel surfaced hard standing areas (maximum 40 m x 20 m) adjacent to each turbine for use by cranes during construction and retained for maintenance use throughout life span of the project.

Identification of Issues

The Draft Scoping Report includes the issues identified during the announcement of the scoping. The project and EIA process was advertised in one local and two regional newspapers and letters with personal notification regarding the EIA process was mailed to all pre-identified key stakeholders on the database, which at the time consisted of 86 I&APs. At the time of producing this report, the database stands at 99 registered I&APs. Issues were further identified by a meeting between the EIA consultant, specialists and land owners. A synthesis of these issues is provided in the Issues & Response Trail (Chapter 5), which includes an explanation of how the issues will be addressed through the EIA process.

In summary, the following issues have been identified:

- *Flora and Fauna (excluding avifauna)* : Impact of the turbines and associated activities during construction as well as operation, on the vegetation and animals, with special attention to red data species.
- *Ecology*: Impact of turbines on habitat loss, pattern and connectivity and disturbance regimes in relation to the study areas of special concern, such as permanent water bodies.
- *Avifauna*: Bird mortality from collisions with turbines.
- *Bats*: Impact of turbines on bats roosts, in particular in foraging areas, if any occur.
- *Visual*: Visual impact of turbines on the sense of place and landscape character.
- *Noise*: Impact of noise from the turbines during operation, as well as noise from construction, on sensitive receptors (e.g. nearby dwellings, birds, cattle). Transmission of low frequency noise generated by wind turbines
- *Traffic and Transportation* Access to Provincial/National Roads and potential traffic generation
- *Heritage* : Potential impact on archaeology (e.g. stone age artefacts), impact of excavations on palaeontology (e.g. fossils), or impacts on any built structures over 60 years old (Phase 1 Archaeological Heritage Impact Assessment)
- *Economics*: Impact of the wind farm on the overall economic development potential in the area, including impacts on commercial enterprises nearby the site is associated with project expenditure on direct and indirect employment and

household incomes. Degree of fit with local, regional and national economic development visions and plans, including renewable energy planning

The draft *Plan of Study for EIA* presents the approach to the forthcoming EIA phase. This includes the Terms of Reference for the various specialist studies that are proposed to address the issues raised, where necessary.

Electrical connections

The wind turbines will be typically connected to each other and to the substation using medium voltage cables which will, in most cases, be buried approximately 1 m below ground, except where a technical assessment of the proposed design suggests that overhead lines are appropriate.

A new sub-station (maximum compound size 90 m x 120 m) and transformer to the 132 kV Eskom grid will be built. The substation will preferably be located close to the 132 kV line. The connection from the substation to the Eskom grid line is a stretch of overhead line supported on an intermediate pole(s), depending on the location of the substation relative to the 132 kV line.

Other infrastructure

Operations and maintenance building: Close to the substation a single storey building, maximum 5000 m², with warehouse/workshop space and access, office and telecoms space and security and ablution facilities as required as well as permanent wind measuring mast of 70 m – 100 m height.

Gravel surfaced access roads onto the site from the public road (3 access route options are proposed) and an internal road network to the turbines and other infrastructure (substation and operation and maintenance building). The road network may include turning circles cabling and drainage and upgrading of certain existing roads may take place.

Priority Challenges	Strategic Approach
The towns of Hankey and Patensie are allocated a quota of water from the Kouga dam and canal system by the Gamtoos Irrigation Board. The need for future housing developments will require an increase in the water allocated for domestic use.	A meeting has been scheduled in February with the GIB to discuss this increase in the quota.
The agreement pertaining the allocation of bulk water supply purchased by Kouga from the Nelson Mandela Metro needs to be formalized and concluded.	A meeting has been scheduled in February with the NMM to discuss this increase in the quota.
Our underground water sources investigated and explored to augment the existing supply obtained from surface sources(dams) to protect these scarce commodities and sustain development.	Engage DWA to assist in doing feasibility studies and possible funding.
To eradicate backlogs at existing waste water treatment plants to provide capacity for future housing developments	Engage DWA for possible funding of these projects.
Existing bulk/connector infrastructure requires to accommodate the increase in effluent generated by the developments.	Engage DWA for possible funding of these projects.

FIVE YEAR PLAN PROGRAMME

TABLE NO. 1		KOGUA MUNICIPALITY: 5-YEAR CAPITAL PROGRAMME FOR ELECTRICAL WORK					DATE: 23 APRIL 2010
Item No.	Area	Description	Estimated Total Project Cost	Funded by	Shared Cost	Financial Year	
1.0	Jeffreys Bay						
1.1	Main Supply	Secure 66kV overhead line servitudes and substation sites	R 1.25 mil	Munic	-	2009/10 & 10/11	
1.2	Ocean View	Electrification of 500 Sub-Economic Houses	R 3.70 mil	DME	Munic	2010/11	
1.3	Central	2nd 66/22kV Transformer Bay at Main Intake Substation	R 2.60 mil	DME	-	2010/11	
1.4	Ocean View	Upgrade Ocean View Substation	R 2.86 mil	DME	-	2010/11	
1.5	Farmers	Replace insulators on 22kV overhead line to farmers, incl. additional 22kV auto-reclosers/sectionalizers	R 0.40 mil	Munic	-	2010/11	
1.6	Main Supply	Repair work to 66kV overhead line between Melkhout and Main Intake Substations	R 1.40 mil	Munic	-	2010/11	
1.7	Ocean View	22kV Overhead line link between Ocean View Substation and existing line terminating at Waste Water Treatment Works	R 0.41 mil	Munic	-	2010/11	
1.8	Main Supply	2nd 66kV Overhead line between Melkhout and Main Intake Substations, together with alterations to 22kV network so that 22kV circuit on 66kV line in St. Francis Drive can be operated at 66kV: * First option: Single Circuit (Only this option carried forward to Table No. 2)	R 26.05 mil	Developer (30%)	Munic (70%)	2011/12 to Later	

TABLE NO. 1		KOGUA MUNICIPALITY: 5-YEAR CAPITAL PROGRAMME FOR ELECTRICAL WORK					DATE: 23 APRIL 2010
Item No.	Area	Description	Estimated Total Project Cost	Funded by	Shared Cost	Financial Year	
		* Alternative option: Double Circuit	R 36.50 mil				
1.9	Paradise Beach	Upgrade supply from Apiesdraai Substation to Paradise Beach Main Intake Substation, incl. upgrade of latter substation	R 6.03 mil	Munic	-	2011/12	
1.10	Ocean View	Electrification of 1500 Sub-Economic Houses	R 10.05 mil	DME	Munic	2011/12	
1.11	Central	Replace existing 11kV cable between Substations SS-76 and SS-4 as per master plan	R 0.425 mil	Munic	-	2011/12	
1.12	Wavecrest	Strengthen main 11kV supply cable between Main Intake Substation and new 11kV switchgear near Substation SS-32 as per master plan	R 2.37 mil	Munic	-	Later	
1.13	Wavecrest	Temporary 11kV cable link between Substations SS-90 and SS-107 as per master plan	R 0.43 mil	Munic	-	2010/11	
1.14	Ocean View and Pellsrus	Bulk infrastructure upgrade for Sub-Economic Houses	R 1.50 mil	DME	-	2012/13	
1.15	Ocean View	Electrification of 900 Sub-Economic Houses	R 6.75 mil	DME	Munic	2012/13	
1.16	Central	New 11kV cable between Main Intake Substation and SS-49, incl. 11kV switchgear as per master plan	R 2.95 mil	Munic	-	2013/14	
				DME	Munic		

TABLE NO. 1		DATE: 23 APRIL 2010				
KOUGA MUNICIPALITY: 5-YEAR CAPITAL PROGRAMME FOR ELECTRICAL WORK						
Item No.	Area	Description	Estimated Total Project Cost	Funded by	Shared Cost	Financial Year
1.17	Ocean View	Electrification of 750 Sub-Economic Houses	R 6.35 mil	R 5.40 mil	R 0.95 mil	2013/14
1.18	Central	Complete 11kV cable ring feed between Substation SS-66 and RMU - St. Francis Drive as per master plan	R 0.54 mil	Munic	-	2013/14
1.19	Jubilee Development	New Jubilee 66/11kV Substation and connecting 66kV overhead line	R 40.00 mil	Developer R 28.00 mil	Munic R 12.00 mil	2010/11 to 12/13 & Later
1.20	Boplaas Development	New Boplaas 66/11kV Substation and connecting 66kV overhead line	R 26.00 mil	Developer R 18.00 mil	Munic R 8.00 mil	2010/11 to 12/13 & Later
1.21	Wavecrest	New Wavecrest 66/11kV Substation and connecting 66kV overhead line	R 14.00 mil	Developer R 10.00 mil	Munic R 4.00 mil	2010/11 to 12/13
1.22	Wavecrest	General - Extend/Upgrade 11kV cable network and Switching Stations	R 8.00 mil	Developer R 4.00 mil	Munic R 4.00 mil	2010/11 to 12/13
1.23	Wavecrest	Bulk Supply to Frans van Eeden Development, Portions 8 & 13 of Farm Kabeljows, No. 328.	R 11.12 mil	Developer R 5.22 mil	Munic R 5.90 mil	2010/11 to 12/13 & Later
1.24	Wavecrest	11kV Cable to main beach area	R 4.03 mil	Developers	-	2010/11 to 12/13
1.25	Central	11kV Cable to golf course area	R 3.60 mil	Developer	-	2010/11 to 12/13

TABLE NO. 1		DATE: 23 APRIL 2010				
KOUGA MUNICIPALITY: 5-YEAR CAPITAL PROGRAMME FOR ELECTRICAL WORK						
Item No.	Area	Description	Estimated Total Project Cost	Funded by	Shared Cost	Financial Year
1.26	General	General upgrade and spare transformers	R 1.60 mil	Munic	-	2010/11 to 12/13
2.0	Humansdorp					
2.1	Kwanomzamo	Upgrade 22kV overhead line between Boskloof Substation and Kwanomzamo	R 3.71 mil	DME	-	2010/11
2.2	Kwanomzamo and Kruisfontein	Electrification of 500 Sub-Economic Houses	R 3.69 mil	DME R 3.10 mil	Munic R 0.59 mil	2010/11
2.3	Main Supply	Upgrade 22kV overhead line between Melkhout and Main Industrial Substations	R 4.50 mil	DME	-	2011/12
2.4	CBD	2nd 1500kVA Transformer and associated equipment in 22/11kV substation in CBD area	R 3.00 mil	Munic	-	Later
2.5	Kwanomzamo and Kruisfontein	Electrification of 2800 Sub-Economic Houses	R 20.40 mil	DME R 17.39 mil	Munic R 3.01 mil	2011/12
2.6	Kruisfontein	Upgrade 22kV overhead line between TB Hospital Substation and Arcadia	R 6.50 mil	DME	-	2012/13
2.7	Kwanomzamo and Kruisfontein	Electrification of 2600 Sub-Economic Houses	R 21.54 mil	DME R 18.31 mil	Munic R 3.23 mil	2012/13
2.8	General	General upgrade and spare transformers	R 2.50 mil	Munic	-	2010/11 to 12/13

TABLE NO. 1		DATE: 23 APRIL 2010				
KOUGA MUNICIPALITY: 5-YEAR CAPITAL PROGRAMME FOR ELECTRICAL WORK						
Item No.	Area	Description	Estimated Total Project Cost	Funded by	Shared Cost	Financial Year
3.0	<u>St Francis Bay</u>					
3.1	Central	Upgrade Load Centre No. 1	R 3.36 mil	Munic	-	2010/11 & 11/12
3.2	St Francis-On-Sea	Upgrade Load Centre No. 2	R 0.35 mil	Munic	-	2010/11 & 11/12
3.3	Sea Vista	Upgrade 22kV overhead line between Main Intake Switching Station and Load Centre No. 2	R 4.85 mil	DME	-	2011/12
3.4	Sea Vista	Electrification of 800 Sub-Economic Houses	R 5.20 mil	R 4.42 mil DME	R 0.78 mil Munic	2011/12
3.5	Central	Strengthen 11kV reticulation network between Load Centre No's 1 and 2	R 2.52 mil	Munic	-	Later
3.6	Sea Vista	New Load Centre No. 3	R 5.00 mil	DME	-	2012/13
3.7	Sea Vista	Electrification of 815 Sub-Economic Houses	R 6.00 mil	R 5.10 mil DME	R 0.90 mil Munic	2012/13
3.8	Main Supply	Upgrade Main Intake Switching Station adjacent to Eskom Substation	R 4.00 mil	Munic	-	2012/13 & Later
3.9	Sea Vista	Electrification of 385 BNG Sub-Economic Houses	R 5.07 mil	R 4.31 mil DME	R 0.76 mil Munic	2012/13

TABLE NO. 1		DATE: 23 APRIL 2010				
KOUGA MUNICIPALITY: 5-YEAR CAPITAL PROGRAMME FOR ELECTRICAL WORK						
Item No.	Area	Description	Estimated Total Project Cost	Funded by	Shared Cost	Financial Year
3.10	Central	Bulk Supply to Proposed Development on Erf 626	R 2.00 mil	Developer	-	2012/13
3.11	Industrial Area	Complete 11kV ring feed network	R 0.70 mil	Munic	-	2012/13
3.12	General	General upgrade and spare transformers	R 1.80 mil	Munic	-	2010/11 to 12/13
4.0	<u>Cape St Francis</u>					
4.1	Main Supply	Upgrade Main Intake Substation	R 0.58 mil	Munic	-	2010/11 & 11/12
4.2	General	General upgrade and spare transformers	R 1.20 mil	Munic	-	2010/11 to 12/13
5.0	<u>Oyster Bay</u>					
5.1	Main Supply	Upgrade Main Intake Substation	R 1.35 mil	Munic	-	Later
5.2	General	General upgrade and spare transformers	R 1.00 mil	Munic	-	Later