ENVIRONMENTAL IMPACT ASSESSMENT

Second Draft Environmental Impact Assessment Report for the Proposed Construction, Operation and Decommissioning of a Seawater Reverse Osmosis Plant and Associated Infrastructure in Tongaat, Kwazulu-Natal

SECOND DRAFT EIA REPORT

CHAPTER 12: SOCIO-ECONOMIC IMPACT STUDY

GLOSSARY

BBBEE	Broad Based Black Economic Empowerment
BEE	Black Economic Empowerment
DEA&DP	Department of Environmental Affairs and Development Planning
DM	District Municipality
DR	District Road
EIA	Environmental Impact Assessment
EM	eThekwini Municipality
GDP	Gross Domestic Product
GRP	Gross Regional Product
GVA	Gross Value Added
HDSA	Historically Disadvantaged South African
IDP	Integrated Development Plan
IDM	Ilembe District Municipality
KZN	Kwa-Zulu Natal
LED	Local Economic Development
LM	Local Municipality
MR	Main Road
NPV	Net Present Value
NSDI	Noise Sensitivity Depreciation Index
SANS	South African National Standard (for noise levels)
SDF	Spatial Development Framework
SWRO	Seawater reverse osmosis technology

SUMMARY

Umgeni Water is proposing to construct and operate a desalination plant at Tongaat on the KwaZulu-Natal (KZN) North Coast which could produce 150 Ml/day of freshwater when at final capacity. This report presents the economic specialist study to form part of the EIA for the plant and associated infrastructure.

A critical aspect of economic desirability is the **compatibility of the project with water supply planning** and wider **economic development planning** as reflected in **spatial development planning**. With regard to water supply planning documents, they contain clear justifications for moving to the detailed feasibility assessment and associated EIA phase for desalination. It has also been recognised in planning documents that desalination would entail relatively high costs. However, given the limited alternatives, the avoidance of higher costs into the future is unlikely to be possible. In any event, water supply planning will remain a dynamic process in which additional information and data is periodically added to that which requires consideration in decision-making. The Department of Water and Sanitation and Umgeni Water will thus need to continue to carry out their mandates and consider the costs and other relevant aspects of the desalination project alongside other water supply options.

Broad **spatial planning guidance for the site** indicates that it has been earmarked for residential development in the future although it is currently used for agricultural purposes. This does not mean that strictly only residential development should take place on the site. It does, however, call for clear justifications for proposals for the site that do not entail residential development. One could argue that the supply of water for residential and other purposes would qualify as a reasonable justification in this regard. In essence, this is what eThekwini Municipality's Framework Planning Branch have done in their comments submitted to the EIA process where they raise no objections to the plant from a planning perspective given the potential for it to resolve water shortages in the Northern area of the Municipality. It goes without saying that this conclusion assumes that environmental impacts can be kept to an acceptable minimum.

With respect to **opportunity costs of land conversion**, the ~7 ha plant site would entail the highest opportunity costs by a significant margin when compared to the other project components. The Social Specialist Study has taken the lead in the assessment of agricultural use and associated livelihoods on the site. It notes that the site is currently used for relatively small-scale vegetable production and that there are about 100 staff working on the affected land mainly from the surrounding informal settlements. The opportunity costs with respect to current land use would therefore be relatively high in production terms given the high intensity production taking place. Land conversion would also have significant opportunity costs in terms of lost livelihood opportunities unless production can be established elsewhere. More detailed assessment and mitigation measured in this regard are contained in the Social Specialist Study. Mitigation in project planning also includes the compensation of land owners for land losses or restrictions in the form of servitudes. All amounts in this regard should be fairly determined with the help of professional independent valuers.

In light of future planning guidance for the area it is also instructive to consider the opportunity costs associated with alternative potential future uses of the site. The site is generally well suited to future residential development given its position in an area earmarked for further

growth, sea views on offer and easy access to the beach. Opportunity costs in this regard are thus likely to be high given the residential development that would have to be foregone.

The proposed project would entail **significant financial costs to Umgeni Water that would be passed on to its customers** in the form of water tariffs. Total capital costs have been estimated at R4.4 billion including engineering fees, land acquisition and project management. Operation and maintenance costs have been estimated at R400 million/yr and these include annual operation and infrastructure maintenance, staff costs, chemical costs, membrane replacement costs and power supply. Given the costs of the desalination plant it is likely that **water tariffs** in the area will have to continue increasing at rates above the base tariff and probably above the general rate of inflation. Bear in mind that any tariff increases related to desalination would take place within a context where it is likely that tariffs will need to increase regardless of which water supply option is implemented next. This is a common situation throughout the country and relates to all new water supply options generally being more expensive relative to existing schemes which were often constructed first precisely because of their lower cost.

At an overall level the Marine Specialist Study found that mitigation measures would reduce the negative impacts to a low significance level. This finding along with the relatively small potential sacrificial zone associated with the project indicates that **impacts on fishing** would be **low** during construction and operations with mitigation.

Risks to tourism and recreation would be more prominent at the plant site given greater tourism use particularly on the beach nearby. The construction requirements for the project would be intensive. While the intensity of disturbance during construction would be relatively high, it would be temporary returning to normal after construction. Due to the use of tunneling under the beach, it will be possible to use the beach to a degree during construction.

Visual impact during operations would be a concern for tourism given the contrast between the industrial nature and size of the plant and its potential surrounds. Risks would be focused on people engaging in tourist activities nearby and those using nearby tourism facilities such as the Seabelle Restaurant and Hotel. With respect to the overall significance of visual impacts, the Visual Impact Assessment (VIA) concludes that they would have a medium significance with mitigation for:

- Landscape impact of the desalination plant on a landscape with mixed rural, residential and beach front character.
- Visual intrusion of the plant on existing views of sensitive visual receptors in the region
- Visual intrusion of a power line from the desalination plant to the La Mercy Major Substation (initial alignment) on the existing views of sensitive visual receptors in the region. The significance of this impact will be low if the Alternative 1 or 2 powerline route is constructed.

Although there would be some opportunity to mitigate visual impacts, the establishment of a plant of a nature and size proposed within the surrounding context would not be supportive of current tourism use or of the future development of tourism in the local area. Overall impacts on tourism and recreation during operations have been given a **medium** significance rating with mitigation when considering visual impacts along with relatively lower risks from noise and marine impacts.

The project's impacts discussed above and in other specialist studies have the potential to be reflected in, or **impact on, property values**. Impacts on property values are thus a reflection of other impacts already assessed in this study along with impacts assessed in other studies forming part of the EIA. This needs to be taken into account in order to avoid the double counting of impacts. The focus of

assessment was on risk factors for residential property values in particular. However, it needs to be borne in mind that the project would augment water supplies which are critical if property values are to be maintained. In this sense, the project or any other water supply project would provide important support for property values.

The construction phase would be associated with high intensity visual, noise and dust impacts along with disruptions. This would entail risks to the short-term saleability of surrounding property as would be the case with virtually all major construction projects. The property market is, however, likely to take its lead from permanent impacts. During the operational phase the visual impacts of the plant and powerlines would be the key driver of impacts as noise and marine impact would be relatively more manageable. Overall impacts would be high without mitigation and could be reduced to a **medium** level of significance with mitigation. Key areas where visual risks to property values would be prominent would include:

- King Shaka Estate and other nearby houses in Desainagar where views are directly over the site. Note that to a degree these risks would be lessened due to the elevation of the Estate above the site which would allow for the maintenance of the majority of distant view of the horizon.
- Houses along the north northern and western edge of La Mercy would also bear some risks. The closest houses in this area would, however, be 200m from the powerlines.

Estate agents and residents have expressed concern regarding the introduction of what is essentially a large industrial facility into a sea-side residential and small scale farming area that would use technology (i.e. desalination) which is not familiar in the South African context. These concerns, which include an element of stigma or averse public perceptions, are valid given the little-know nature of the technology to be used and because the project will result in higher risks relative to more compatible uses such as residential development. It is thus considered likely that the project would be associated with some level of stigma with potential negative impacts on the property market nearby. If the project does go ahead, it will be very important that the applicant institutes mitigation measures to limit the formation of ill-informed perceptions regarding the project. This should help to limit the emergence of unfounded stigma.

The plant would have a positive impact on economic activity in the local area and region given the size of the **new spending injection** associated with it. It is expected that between 195 and 255 temporary jobs would be associated with the construction phase spread over roughly 30 months. Although operational expenditure would be significant, the plant would not be particularly labour intensive requiring approximately 30 people to operate it at full capacity. The no-go would have no impact in the locality relative to these benefits as there would be no expenditure injection. Water supply needs would still, however, need to be met even if the project does not go ahead. To a degree, expenditure that would have flowed from the project would therefore essentially be 'replaced' by expenditure on other water supply projects that will have to go ahead in order to supply water to the wider area. For this reason, impacts associated with expenditure should not be treated as a key decision factor.

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CHAPTER 12: ECONOMIC SPECIALIST STUDY

12.1 INTRODUCTION

This chapter presents the economic specialist study prepared by Dr Hugo Van Zyl of Independent Economic Researchers as part of the Environmental Impact Assessment for the proposed 150 Ml Seawater Reverse Osmosis Plant and associated infrastructure in Tongaat, KwaZulu Natal

Umgeni Water is proposing to construct and operate a desalination plant at Tongaat on the KwaZulu-Natal (KZN) North Coast using seawater reverse osmosis technology (SWRO). The intake capacity of the plant will be approximately 333 Ml/day, producing 150 Ml/day of freshwater when at final capacity. The plant will have a lifespan of 20-25 years with the potential of a lifespan extension.

12.1.1 Scope of work and terms of references

The overall objectives of the economic specialist study was to:

- Determine the current economic conditions in sufficient detail so that there is a baseline against which impacts can be identified and measured.
- Identify potential impacts that may occur during the construction, operational and decommissioning phases of development, as well as impacts associated with future socio-economic changes if the "no-go" option is implemented (both positive and negative).
- Assess the impacts, in terms of direct, indirect and cumulative impacts. This includes impacts of all proposed infrastructure on existing and proposed infrastructure and services in the area, e.g. roads, telecommunication, electricity.
- Provide recommendations with regards to potential monitoring programmes.
- Determine mitigation and/or management measures which could be implemented to as far as possible reduce the effect of negative impacts and enhance the effect of positive impacts.
- Incorporate and address all issues and concerns raised during the Scoping phases of each EIA relevant to the specialist's area of expertise

Prior to the completion of the scoping phase, the terms of reference for the study noted that while it is difficult to be sure of all relevant impacts before commencing with assessment, it is likely that the following impacts or key issues would need to be assessed using a cost-benefit analysis framework:

- Broad level review of the need and financial costs and risks associated with the project.
- Degree of fit with local, regional and national economic development visions and plans including water supply plans and spatial development frameworks.
- Opportunity costs and their distributional impacts associated with the use of the land making up the sites for development. These opportunity costs are expected to primarily be on the form of lost agricultural production given the nature of the site.
- Impacts on overall economic development potential in the area including impacts on commercial enterprises nearby the sites (incl. tourism, agriculture, fisheries and others).
- Impacts associated with environmental impacts that cannot be mitigated and have socio economic implications. This would focus on potential negative impacts on neighbouring land owners, communities and user groups (recreational users for example) should they be relevant.

- Impacts associated with project expenditure on direct and indirect employment and household incomes. These impacts should be investigated through an examination of how the project and the spending injection associated with it may impact on the local and regional economy.

12.1.2 Study Approach

The approach adopted involved the following steps in line with accepted EIA practice:

1. Investigate the existing context within which the project would be established.
2. Identify impacts.
3. Assess impacts without mitigation measures.
4. Recommend mitigation measures.
5. Re-assess impacts assuming mitigation measures are implemented.

Guidance on the approach was taken primarily from the Department of Environmental Affairs and Development Planning (Western Cape) guidelines on economic specialist input to EIA processes (van Zyl et al., 2005. This included guidance on the appropriate level of detail required for the assessment in order that it be adequate for informing decision-making without going into superfluous detail (i.e. superfluous detail in this report as well as superfluous detail when the briefs of other specialist studies forming part of the EIA are taken into account).
Details on the approaches used to assess impacts are contained in the individual sections dealing with the impacts.

12.1.3 Information Sources

Key information used in the assessment includes:

- Census data and other socio-economic baseline data.
- Policy document focused on water supply planning, economic development planning, spatial planning.
- Literature on the key impact categories assessed.
- Interviews with key stakeholders.
- I&AP comments and inputs into the EIA process.
- Inputs from the other specialists making contribution to the EIA.

12.1.4 Assumptions and Limitations

The following assumptions and limitations apply to this study:

- All technical, financial (i.e. market surveys, business plans and costs) and other information provided by the applicant, the applicant's project team, other official sources and other specialists involved in the EIA is assumed to be correct unless there is a clear reason to suspect incorrect information.
- The degree of detail achievable in the assessment of impacts that rely on the findings of other specialist studies is highly reliant on the degree of detail contained in those specialist studies.
- The quantification of economic impacts in order to inform the assessment of the significance of impacts was not possible, nor considered necessary, for all impacts. Where possible, quantification focused on impacts considered to be most important in the overall assessment. Assessments of impact significance made without quantification (and based on a consideration of the likely magnitudes of impacts and/or expert judgements) are, however, considered adequate unless otherwise specified.

- All impacts are assessed individually and then as a whole to the degree possible and appropriate. An overall assessment and discussion of net impacts (i.e. whether overall benefits exceed costs or vice versa) was undertaken to the degree thought appropriate and justifiable combining quantifiable and unquantifiable impacts. Given uncertainties and the potentially subjective nature of comparisons between impact categories, the emphasis in the report is on presenting assessments of socio-economic impacts with less emphasis on trying to reconcile them in an overall assessment of net effects. To a large degree this role of comparing and weighing up different (and hard to reconcile) impacts is the ambit of the relevant decision-making authorities.
- Direct comparison with alternative water supply options was beyond the scope of the study.
- The findings of the assessment reflect the best professional assessment of the author drawing on relevant and available information within the constraints of time and resources thought appropriate and made available for the assessment. See Appendix 2 for the disclaimer associated with this report.

12.2 PROJECT DESCRIPTION: ECONOMICS

The Final Scoping Study and Environmental Impact Report provide detailed descriptions of the project. These are not repeated here. A brief overview of project elements are, however, provided below.

The intake capacity of the desalination plant would be approximately 333 Ml/day, producing 150 Ml/day of freshwater when at final capacity. The plant would have a lifespan of 20-25 years with the potential for extension and may be constructed in two phases over a period of five years. It would consist of on-site elements as well as the following linear infrastructure elements:

Seawater intake and pipelines: Seawater will be abstracted from the marine environment *via* an intake structure located 650m from shore at a water depth of about 20 m.
Seawater pump station: A seawater pump station is proposed within the footprint of the desalination plant.

Seawater Reverse Osmosis (SWRO) desalination plant: The proposed desalination site will require an area of land approximately 70 000 m2 in extent. The desalination plant is proposed at an elevation of approximately 22 m above sea level, inland of the M4 highway and about 200 m from the coast.

Brine discharge pipeline: The brine discharge tunnel would also extend under the M4 highway, the coastal forest and the beach, to a diffuser located about 350 m offshore at a water depth of approximately 10 m.

Brine diffuser system: Brine will be discharged *via* a number of outlet ports in the diffuser. These will discharge the dense brine upwards into the water column to provide good mixing with the ambient seawater.

Potable water pipelines: The first potable water pipeline will lead from the desalination plant in a north-west direction to the La Mercy Reservoir. From there, a second potable water pipeline will continue north-westwards from the La Mercy Reservoir to the Hazelmere Bifurcation pipeline (Tying into the Hazelmere Bifurcation pipeline would allow for water to be delivered to both the north and to the south by reversing the flow in the bifurcation pipeline). The third pipeline will extend from the La Mercy Reservoir in a south-west direction following the direction of the N2 National Road before turning westwards and coming to an end at the Waterloo Reservoir. The potable water pipelines will be developed with a capacity of more than 150 Ml/day.

Power supply infrastructure: The extent of energy required for the proposed desalination plant will be sourced from Eskom's national electricity grid. Transmission lines would be required to transfer electricity from existing high power 132 kV or 275 kV lines to the desalination site and a substation would be required to reduce the voltage to 11 kV.

12.3 DESCRIPTION OF THE AFFECTED ENVIRONMENT: ECONOMICS

The significance of impacts is often highly dependent on the economic environment or context within which they occur. For example, job creation in a small local community with a stagnating economy and high unemployment will be far more significant than it would be in a larger community with a healthy economy. In order to offer such baseline information to the impact assessment this section describes the socio-economic environment.

Given the location and nature of the project, the economic context includes information primarily on eThekwini and Tongaat along with the smaller local areas near the plant site including La Mercy, Desainagar, Tongaat Beach, Genazanno and Westbrook. It is also important to bear in mind that, based on current planning, 50% of the water from the desalination plant would be supplied to eThekwini and the remaining 50% to the iLembe District.

The main information sources used were Census 2011 data, Community Survey 2007 data, Integrated Development Plans, Spatial Development Frameworks and Demarcation Board data.

12.3.1 Demographics

The 2011 Census estimated the population of eThekwini to be approximately 3.44 million up from 3.09 million in 2001 and implying an annual growth rate of 1.13% (StatsSA, 2012). With respect to future population growth projection, the eThekwini Municipality expect growth to remain relatively robust with the total population reaching 3.77 million by 2020 (EM, 2013). The table below shows the 2011 population estimates for the local areas near the proposed project site. The main town area of Tongaat had a population of approximately 42,500 whilst the coastal areas near the proposed project site had smaller populations with 2,778 people living in La Mercy, 983 in Desainagar and 722 in Tongaat Beach.

Table 12-1: Population by area and population group (2011)

	KwaZulu-Natal	eThekwini	Tongaat	La Mercy	Desainager	Tongaat Beach	Genazzano	Westbrook
Black African	8,912,479	2,540,360	17,477	1156	779	157	1,191	313
Coloured	141,373	85,906	509	51	2	18	41	44
Indian or Asian	756,984	573,327	24,148	1340	148	503	1,314	462
White	428,797	228,402	187	205	53	33	27	703
Other	27,169	14,271	233	26	1	11	11	5
Total	**10,266,802**	**3,442,266**	**42,554**	**2,778**	**983**	**722**	**2,584**	**1,527**

Source: StatsSA, 2012

12.3.2 Employment

As with the rest of the country, unemployment is a major challenge in the wider area. This situation continues to be exacerbated by the current difficult economic climate characterised by relatively low levels of economic growth. Based on the 2011 Census figures in Table 12-2 below, the eThekwini Municipality had an unemployment rate of approximately 30% slightly better than the KZN provincial

average of 33%. In the local areas around the proposed site, unemployment was generally lower ranging between 19% and 23% for Tongaat, La Mercy and Desainagar and staying below 15% in Tongaat Beach, Genazzano and Westbrook.

Table 12-2: Unemployment by area (2011)

	KwaZulu-Natal	eThekwini	Tongaat	La Mercy	Desainager	Tongaat Beach	Genazzano	Westbrook
Employed	2,041,394	992,518	13,439	943	446	301	1,110	537
Unemployed	1,006,383	430,313	3,078	288	107	19	169	44
% unemployed	**33%**	**30%**	**19%**	**23%**	**19%**	**6%**	**13%**	**8%**

Source: StatsSA, 2012

Formal employment comprised 76% of total 2011 employment in eThekwini, whilst informal employment made up the remaining 24%. The informal sector employed 262,758 people in 2011, up from 233,104 people in 2006 (EM, 2013).

With regard to the sectoral division of employment opportunities, the tertiary sector accounted for 73% of employment in eThekwini in 2012, while the secondary sector accounted for 26% and the primary sector made up 1%. With respect to the broad economic sectors in eThekwini, trade accounted for 23.5% of total employment, while manufacturing accounted for 18.6% and community services for 20.7% in 2012. The community services sector percentage contribution increased in the past five years, while the trade and manufacturing sectors decreased in their percentage contribution over the same time period (EM, 2013).

Unfortunately it is not possible to get an accurate estimate of current jobs in the tourism sector on the basis of Census statistics as they do not have a separate category for tourism. Tourism is, however, recognised as a key sector in eThekwini and in the local areas near the proposed sites making a highly significant contribution to employment creation.

12.3.3 Household incomes

The table below reports on the percentage of households per household income level in the study area for 2011. Approximately 27% of households in eThekwini had incomes below R9,600 per year which is close to the KZN provincial average of 29%. Real disposable income in eThekwini grew by an average of 3.6% per annum from 2006 to 2011, despite dipping to a negative growth rate of 0.9% in 2009. From 2006 to 2011, the percentage of lower income households decreased by 18.6%, the middle income group increased by 7.3% and the affluent category increased by 9.3% (EM, 2013).

Tongaat had more favourable household income levels compared to the eThekwini average with 22% of households having annual incomes below R9,600. In the local coastal areas around the proposed site, household incomes were variable with La Mercy and Desainagar both having above 30% of households with incomes below R9,600 while Tongaat Beach and Westbrook had 14% and less of households in this income category.

Table 12-3: Household incomes by area (2012)

Annual income	KwaZulu-Natal	eThekwini	Tongaat	La Mercy	Desainager	Tongaat Beach	Genazzano	Westbrook
No income	15%	17%	13%	19%	19%	6%	16%	11%
R 1 - R 4800	5%	4%	4%	5%	5%	1%	4%	1%
R 4801 - R 9600	9%	6%	5%	6%	10%	1%	5%	2%
R 9601 - R 19 600	19%	14%	14%	15%	23%	9%	10%	11%
R 19 601 - R 38 200	20%	17%	16%	13%	19%	8%	9%	9%
R 38 201 - R 76 400	12%	13%	15%	8%	7%	8%	6%	8%
R 76 401 - R 153 800	8%	11%	15%	8%	2%	14%	9%	10%
R 153 801 - R 307 600	6%	9%	11%	10%	5%	21%	16%	18%
R 307 601 - R 614 400	4%	6%	6%	10%	5%	20%	15%	19%
R 614 001 - R 1 228 800	1%	2%	1%	4%	3%	9%	5%	8%
R 1 228 801 - R 2 457 600	0%	1%	0%	0%	1%	3%	2%	2%
R 2 457 601 or more	0%	0%	0%	1%	1%	1%	1%	0%
Total	100%	100%	100%	100%	100%	100%	100%	100%

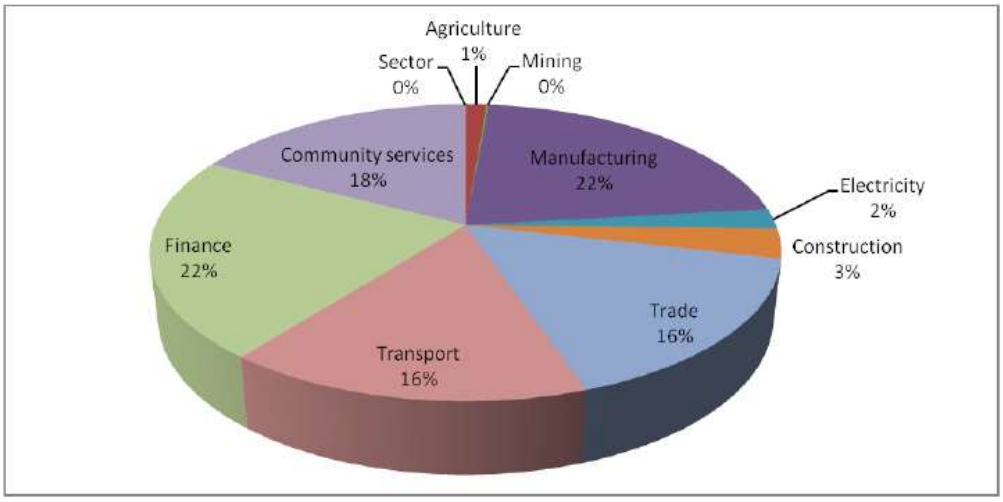
Source: StatsSA, 2012

eThekwini Municipality also reported that the percentage of people living in poverty within their area has reduced from 34% in 2006 to 31% in 2011 (EM, 2013).

12.3.4 Economic growth and key sectors

Gross Domestic Product (GDP) provides a broad indicator of economic output and general economic growth. GDP within eThekwini Municipality was estimated at R206.9 billion in 2012 (in constant 2005 prices) and comprises 65.5% of KwaZulu-Natal's GDP and 10.7% of the national GDP (EM, 2013).

Figure 12-1 shows the percentage contribution to eThekwini GDP per sectors for 2012. On the whole, the economy is dominated by finance (22% of GDP), manufacturing (22% of GDP), community services (18% of GDP), trade (16% of GDP), transport (16% of GDP) and construction (3% of GDP). Within manufacturing, food and beverages, as well as fuel, petroleum, chemical and rubber products were prominent contributors.



Source: EM (2013).

Figure 12-1: Percentage contribution to GDP per sector (2012)

12.3.5 Infrastructure delivery

Infrastructure delivery is a key element of economic development which the eThekwini Municipality continues to address (EM, 2013). Table 12-4 below shows recent estimates of backlogs of different services to houses/dwellings in the municipality together with anticipated delivery rates and the related timeframes for backlog eradication. Water services delivery, for example, has a backlog of approximately 73,500 houses which should be possible to deal with in 29-37 years assuming current funding levels remain relatively constant.

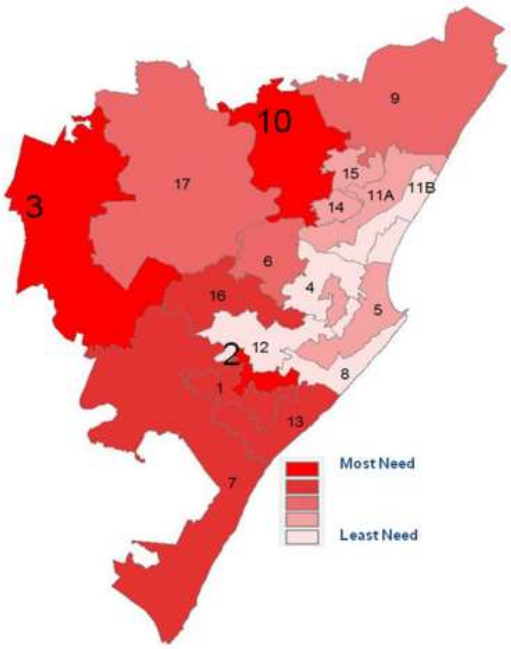
Table 12-4: eThekwini infrastructure backlogs and targets (2012)

Basic Service	Existing Backlog (consumer units) as at 30 June 2012	Delivery ranges per annum	Timeframe to address based on current funding levels *
Water	73460	2000-2500	29-37 years
Sanitation	226557	8000-10000	23-28 years
Electricity	301448	8000-13000	23-37 years
Refuse removal	0	1500-2000	0 years[2]
Roads	1 456kms	10-15kms	97-145 years

* - The timeframes indicated depend on the rollout of funding / subsidies.
# - Linked to the housing delivery programme.

Source: EM (2013).

The map in Figure 12-2 below taken from the municipally IDP gives an indication of the areas of greatest need with respect to infrastructure provision within the eThekwini municipal area. The area around the proposed project site, for example, has a medium level of need relative to other areas in the municipality.



Source: EM (2013).

Figure 12-2: Level of infrastructure provision need within eThekwini (2012)

Backlogs including those related to water supply are also dealt with extensively in the iLembe District IDP. It notes the following key challenges in this regard (IDM, 2015):

- "The provision of basic infrastructure is hampered by the topographic constraints, low densities and low affordability levels, particularly in rural and traditional areas.
- Service infrastructure in iLembe's urban areas needs upgrading and maintenance, however through grant funding from the Department of Water and Sanitation, particularly MWIG, the municipality is addressing this challenge.
- Rural areas are severely affected by a lack of basic services and continued service delivery backlogs.
- Bulk water supply is a major constraint that effects the entire District and in urgent need of attention.
- 24% of the population still do not have access to clean water and obtain water from rivers and streams. This poses a health risk with further implications regarding the provision of social services.
- 23% of the population still do not have access to basic sanitation.
- The urban areas have proper water borne sanitation systems, but rural areas rely on pit latrines or no system at all. This places tremendous strain on the environment and poses a health risk.
- ILembe has been severely hampered by drought which has diminished the Municipality's ability to provide water to all inhabitants."

12.3.6 Economic development goals

The eThekwini Integrated Development Plan (IDP) is the key planning document that aims to address of the socio-economic challenges faced by the wider Metro area. The 2013/2014 review of the IDP outlines the following development challenges as key (EM, 2013):

- "High rates of unemployment and low economic growth
- High levels of poverty
- Low levels of skills development and literacy
- Limited access to basic household and community services
- Increased incidents of HIV/AIDS and communicable diseases
- Loss of Natural Capital
- Unsustainable developmental practises
- High levels of crime and risk
- Ensuring adequate energy and water supply
- Ensuring food security
- Infrastructure degradation
- Climate change
- Ensuring financial sustainability
- Ineffectiveness and inefficiency of inward-looking local government still prevalent in the Municipality."

In order to address these development challenges and achieve the vision of the municipality, the IDP identifies six strategic priority areas which need to be addressed. Each of these priority areas is associated with an overall goal and a list of strategic Development Principles as follows (EM, 2013):

Strategic priority one: Creating Sustainable Livelihoods
Goal: All citizens in a prosperous eThekwini earn a decent living and support a sustainable lifestyle.

Strategic Development Principles:

- Create infrastructure for economic development;
- Improve and support new livelihood choices;
- Develop skills for the future economic sectors;
- Promote small and medium enterprise;
- Secure resources for future industrial development e.g. land;
- Retain businesses and promote expansion;
- Develop key economic sectors;
- Develop priority nodes and corridors.

Strategic priority two: Socially Cohesive City
Goal: eThekwini has well rounded and caring citizens who act to support the common well being of eThekwini and embrace mutual respect, tolerance and compassion for those in need.

Strategic Development Principles:

- Ensure a more responsive local government;
- Engender mutual respect and ubuntu;
- Empower and develop skills of the citizens;
- Promote sustainable development of vulnerable groups;
- Develop a culture of helping citizens in the Municipality that are in need;
- Enhance municipal learning knowledge management;
- Create a transparent and accountable local government environment.
- Sustainable Human Settlements

Strategic priority three: A Financially Sustainable City
Goal: To maximise the Municipality's financial resources to ensure long-term financial viability and sustainability, thus improving service delivery.

Strategic Development principles:

- Grow and diversify our revenue base;
- Ensure sustainable budgeting;
- Enhance sound financial management and reporting;
- Focus on value for money expenditure.
- Co-ordinate, synergize and maximize public sector funding

Strategic priority four: Creating a Safer City
Goal: All those who live, work, play and invest in eThekwini feel and are safe in private and public spaces.

Strategic Development Principles:

- Promote development of community structures/forums;
- Minimise risk to the Municipality and citizens;
- Create a healthier city;
- Mitigate against disasters;
- Alignment with National and Provincial Health and Safety Programs;
- Promote the security of citizens;
- Promote the safety of citizens.

Strategic priority five: Promoting an Accessible City
Goal: All citizens of eThekwini can easily and affordably access the facilities and service that they require for a sustainable lifestyle.

Strategic Development Principles:

- Promote use of public transport;
- Promote access to basic services;
- Increase density along nodes and corridors;
- Provide equitable access to social facilities;
- Align with strategic spatial plan for the city;
- Enhance communication networks;
- Increase economic and sustainable job opportunities.
- Sustainable Human settlements

Strategic priority six: Environmentally Sustainable City
Goal: The environment of eThekwini protects and promotes the health of its citizens and its biodiversity.

Strategic Development Principles:

- Sustain our ecosystems and natural resources;
- Understand the municipality's natural thresholds and develop within these boundaries.
- Develop integrated and collaborative partnerships to ensure innovative responses to environmental challenges
- Build a green economy and create green jobs;
- Create sustainable human settlement built form;
- Respond appropriately to climate change;
- Ensure alignment of the Municipality's strategic direction with environmental planning and sustainability principles.

The iLembe District Integrated Development Plan (IDP) is the key planning document that aims to address of the socio-economic challenges faced by the District. The 2015/2016 review of the IDP outlines the following development challenges as key (IDM, 2015):

- Creating economic growth and jobs.
- Eradicating backlogs in service delivery.
- Providing for housing and socio-economic development (including mitigating against the impacts of HIV/AIDS).
- Positioning the iLembe area as a prime tourist destination.
- Making the area of iLembe a safe and vibrant meeting place of rural, traditional and urban life-styles.
- Integrating the first and second economies to benefit from investment.
- Achieving a sustainable settlement pattern where people could meet all their needs to provide for a better quality of life and maintain sustainable livelihoods.
- Creating functional and institutional harmony with upstream and downstream spheres of government.

12.4 IDENTIFICATION OF KEY ISSUES AND POTENTIAL IMPACTS

12.4.1 Key Issues Identified During the Scoping Phase

The following socio-economic issues were identified as potentially relevant for assessment during the scoping phase:

1. Compatibility with planning for water supply, socio-economic development and associated spatial development
2. Cost of the project and implications for water tariffs
3. Opportunity costs associated with land use conversions
4. Impacts on fishing
5. Impacts on tourism and recreation
6. Impacts on property values
7. Impacts associated with expenditure linked to the construction and operation of the development.

12.4.2 Identification of Potential Impacts

The following impacts were identified as relevant for assessment based on inputs during scoping, the nature of the project and receiving environment, information from I&APs inputs and consultations and guidance documentation for socio-economic specialist inputs to EIA:

1. Compatibility with planning for water supply, socio-economic development and associated spatial development
2. Cost of the project and implications for water tariffs
3. Opportunity costs associated with land use conversions
4. Impacts on commercial and recreational fishing
5. Impacts on tourism and recreation
6. Impacts on property values
7. Impacts associated with expenditure linked to the construction and operation of the development.

These impacts were assessed and assigned significance ratings where applicable using accepted EIA conventions. Notes that significance ratings were not deemed instructive or appropriate in dealing with issues of planning fit, cost differences and implications for water tariffs and opportunity cost.

Note that the Social Specialist Study took the lead in assessing impacts on livelihoods supported by agricultural activities on the plant site. This Study was thus used as the key informant to the consideration of opportunity costs associated with land use conversions.

The potential impacts identified during the EIA assessment per project phase are therefore:

12.4.2.1 Construction Phase

- Compatibility with planning for water supply, socio-economic development and associated spatial development
- Cost of the project and implications for water tariffs
- Opportunity costs associated with land use conversions
- Impacts on commercial and recreational fishing
- Impacts on tourism and recreation
- Impacts on property values

- Impacts associated with expenditure linked to the construction and operation of the development.

12.4.2.2 Operational Phase

- Compatibility with planning for water supply, socio-economic development and associated spatial development
- Cost of the project and implications for water tariffs
- Impacts on commercial and recreational fishing
- Impacts on tourism and recreation
- Impacts on property values
- Impacts associated with expenditure linked to the construction and operation of the development

12.4.2.3 Decommissioning Phase

As per the Social Specialist Study, it needs to be understood that the socio-economic environment surrounding the site is likely to change substantially over 20-25 years' time which is when decommission may be considered. This makes it impossible to give anything more than highly speculative consideration to the impacts of decommissioning at this stage. It also implies that an assessment of socio-economic impacts at the time of decommissioning would be needed.
Conceptually, decommissioning and rehabilitation of the site would essentially withdraw risks to fishing, tourism and recreation and to adjacent land users/owners and their properties although much will depend on what happens to the plant site (e.g. residential development, a recreational area, etc.). It would result in no more operational expenditure or jobs associated with the project as the project is withdrawn from the economy although the decommission process would provide a limited short term boost to decommissioning contractors.

12.4.2.4 Cumulative impacts

- Facilitation of further development
- Impacts on fishing and water-based recreation
- Impacts on tourism and property values

12.5 ASSESSMENT OF IMPACTS AND IDENTIFICATION OF MANAGEMENT ACTIONS

12.5.1 Compatibility with planning for water supply, economic development and associated spatial development

The proposed project's key strategic objective is to provide much needed additional water supply capacity. It is thus part of wider planning processes focused on water supply planning and socio-economic development and associated spatial planning. With this in mind, this section broadly reviews the project's compatibility or fit with planning objectives and guidance.

12.5.1.1 Water supply planning imperatives

In recognition of the high levels of growth and increasing supply constraints, the then Department Of Water Affairs and Forestry (DWAF) completed the Water Reconciliation Strategy Study for the KwaZulu Natal Coastal Metropolitan Areas in 2009. The objectives of the Strategy were to identify, evaluate and prioritise the interventions that should be implemented to meet future water requirements. The Strategy is used as a decision support framework for making informed decisions on interventions and projects. Subsequent to the Strategy, an update or review document was commission by the Department or Water and Sanitation (DWS) entitled "Support on the Continuation of the Reconciliation Strategy of the KwaZulu-Natal Coast Metropolitan Area: Phase 2 2015 recon update" (see AECOM, 2015). The purpose of this document was to report on the current status of the 2009 Strategy as discussed and agreed upon at the 7th meeting of the Strategy Steering Committee (SSC) held in February 2015. As such it addresses water supply challenges, water requirement projections, water balances and progress on key short, medium, and long-term projects required for the implementation of the Strategy. Internal planning

The 2009 Strategy concluded that over the medium and long term further interventions are required to provide additional water after the implementation of the Spring Grove Dam and its transfer infra-structure (Mooi-Mgeni Transfer Scheme). Both of these schemes are now completed. It recommended that key options which include desalination be considered further and that feasibility studies be conducted on them (DWAF, 2009). Specifically with regard to desalination it states that (DWAF, 2009):

> *"A study to investigate the feasibility of desalination of sea water as an option to provide additional domestic water is being undertaken by Umgeni Water. Initial results suggest that desalination of sea water is becoming economically competitive and should be investigated further. The initial results from the Umgeni Water desalination feasibility study, which became available subsequent to the publication of these results, indicated that a large desalination project becomes economically competitive when compared to conventional development options such as the Smithfield Dam option. This finding indicated that there is not a clear economic differentiation and therefore further higher level investigations are required for desalination options."*

The 2015 Strategy Review provides an update on water supply options being considered. With respect to desalination it notes the following (AECOM, 2015):

> *"Umgeni Water is investigating the option of desalinating seawater as an alternative water supply source. A feasibility study is currently being finalised to investigate two 150 Mℓ/d plants, located at Lovu on the South Coast and Tongaat on the North Coast, respectively. The size of these plants is based on the capacity of existing and proposed bulk water supply infrastructure in these areas, which can be utilised to convey the potable water from the plants to the various distribution points. Current estimates show that the total cost of the infrastructure will be approximately R3 400 million, bringing the cost of water to between R10/kℓ and R15/kℓ. The EIA is underway and the feasibility study will be completed in the near future. Implementation can potentially be achieved by 2019. However, it is noted that initial result indicates the Tongaat plant on the North Coast may not be required as the Lower Thukela Bulk Water Supply Scheme (BWSS) and raising of Hazelmere Dam will address the short-term needs, while the medium- to long-term needs will be from the uMkhomazi Water Project Phase 1 (Smithfield Dam). The feasibility of the Lovu plant depends on an economic comparison with the other proposed scheme for the South Coast, namely the Lower uMkhomazi BWSS."*

Having reviewed the above water supply planning documents, it can be concluded that they contain clear justifications for moving to the detailed feasibility assessment and associated EIA phase for desalination. It has been recognised that desalination would entail relatively high costs. However, given the limited alternatives, the avoidance of higher costs into the future is unlikely to be possible. In any event, water supply planning will remain a dynamic process in which additional information and data is periodically added to that which requires consideration in decision-making. The DWS and Umgeni Water will thus need to continue to carry out their mandates and consider the costs and other relevant aspects of the desalination project alongside other water supply options.

12.5.1.2 Compatibility with socio-economic development and spatial planning

Socio-economic development imperatives inform spatial planning imperatives. A critical aspect of socio-economic desirability is thus whether the proposed development complements planning as reflected in spatial development planning. Integrated Development Plans (IDPs) and their accompanying Spatial Development Frameworks (SDFs) are particularly important in this regard. SDFs in particular are central to economic development planning and are drawn up in order to guide overall development in a direction that local and provincial authorities see as desirable. Indeed, the basic purpose of an SDF is to specify the spatial implications of IDPs designed to optimise economic opportunities.

The proposed project thus ideally needs to be broadly compatible with what is envisaged in IDPs, SDFs, structure plans and other planning documents in order for it to clearly 'fit' with the optimal distributions of economic activity as envisaged in these plans. Or, if the development does not fit in with existing planning, there need to be compelling reasons why a deviation should be considered.

The following spatial planning documents were found to be of particular relevance and were reviewed:

- eThekwini Municipality IDP and SDF.
- eThekwini Municipality North Spatial Development Plan (SDP)

Considered as a whole these documents recognise the critical importance of the availability of reliable water resources in order to facilitate socio-economic development. Similar recognition is also to be found in the IDP and SDF of the iLembe District Municipality which would also rely on the plant for water supplies. Planning documents also recognise the importance of striving for compatibility between land uses and environmental protection that allows for the continued delivery of valuable ecosystem services.

With regard to specific spatial imperatives affecting the site, the North Spatial Development Plan (SDP) was drawn up in 2012 and was informed by the overall eThekwini SDF at the time. The SDP has, in turn, been used for updates of the overall eThekwini SDF. As per the map in the figure 11-3 below, the desalination plant site along with most of the land between La Mercy and Desainagar has been earmarked for future residential development. The potable water pipeline would traverse land planned for future residential and for future business park development. The transmission lines would primarily traverse land planned for agriculture and future residential along with green open space areas particularly along riverine areas. Note that the map shows the recreation/tourism nodes at Umdloti Beach and Westbrook Beach and identifies Casuarina Beach in Genazzano as a recreation/tourism opportunity.

Broad planning guidance for the site indicates that it has been earmarked for residential development in the future although it is currently used for agricultural purposes. This does not mean that strictly only residential development should take place on the site. It does, however, call for clear justifications for proposals for the site that do not entail residential development. One could argue that the supply of

water for residential and other purposes would qualify as a reasonable justification in this regard. In essence, this is what eThekwini Municipality's Framework Planning Branch have done in their comments submitted to the EIA process where they raise no objections to the plant from a planning perspective given the potential for it to resolve water shortages in the Northern area of the Municipality. It goes without saying that this conclusion assumes that environmental impacts can be kept to an acceptable minimum.

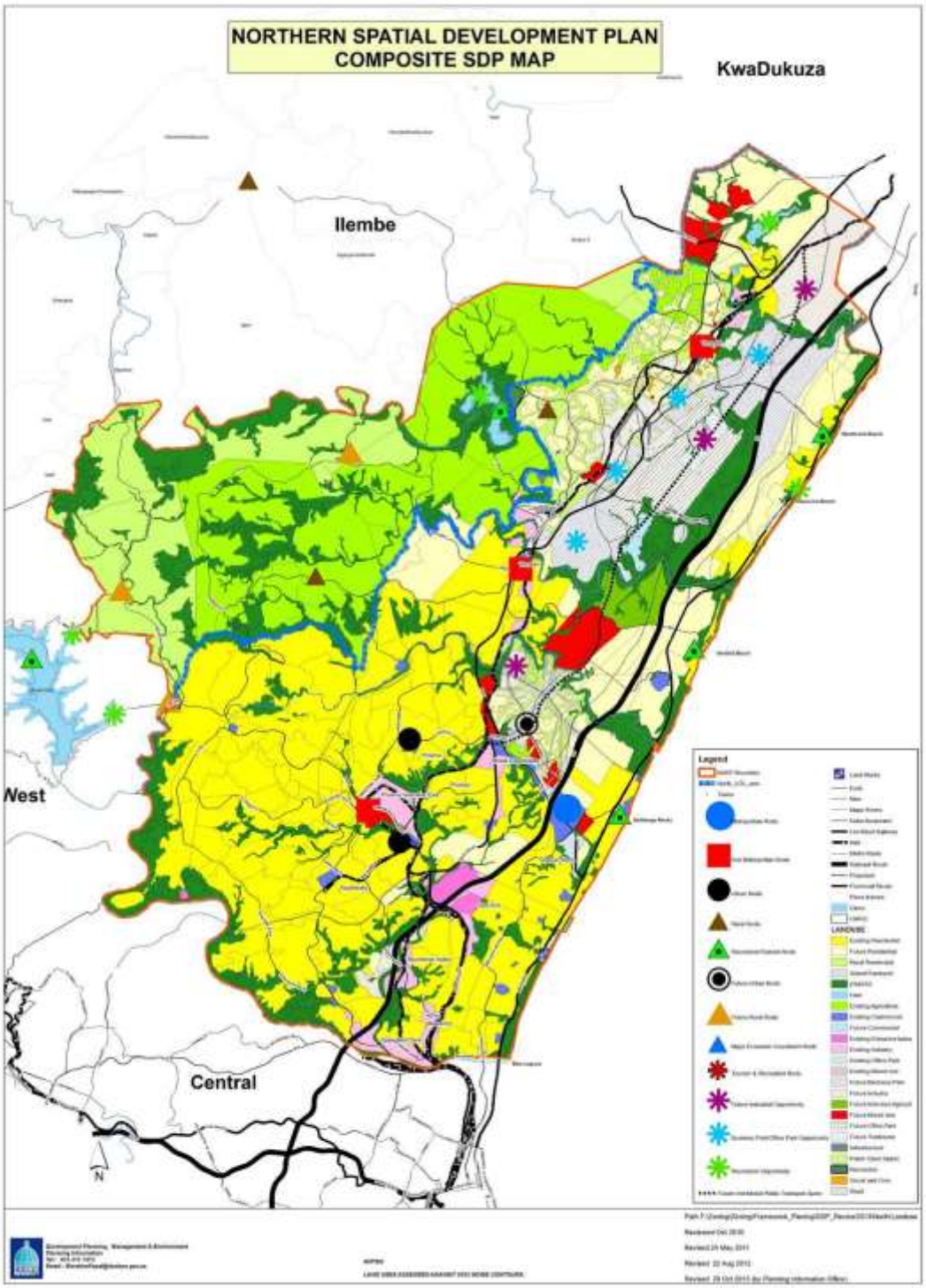


Figure 12-3: North Spatial Development Plan - Map Source: EM (2012)

12.5.2 Opportunity costs associated with the use of land

The project would require relatively significant conversion of land to make way for the necessary infrastructure including the plant, pump station, pipelines and transmission lines. The loss of this land would entail an opportunity cost in terms of uses foregone. Note that

12.5.2.1 Desalination plant site

The 7 ha plant site would entail the highest opportunity costs by a significant margin when compared to the other project components. The Social Specialist Study has taken the lead in the assessment of agricultural use and associated livelihoods on the site. It notes that the site is currently used for relatively small-scale vegetable production (lettuce, carrots, beetroot, etc.) and that the bulk of the produce is sold to formal traders and shops in the Durban area (Pick 'n Pay, Shoprite, Spar, etc.) with lower grade produce also sold on the informal market. There are about 100 staff working on the affected land mainly from the surrounding informal settlements.

The opportunity costs with respect to current land use would therefore be relatively high in production terms given the high intensity production taking place. Land conversion would also have significant opportunity costs in terms of lost livelihood opportunities unless production can be established elsewhere. More detailed assessment and mitigation measured in this regard are contained in the Social Specialist Study.

In light of future planning guidance for the area as discussed in Section 12.5.1.2 it is also instructive to consider the opportunity costs associated with alternative potential future uses of the site. The site is generally well suited to future residential development given its position in an area earmarked for further growth, sea views on offer and easy access to the beach. Opportunity costs in this regard are thus likely to be high given the residential development that would have to be foregone.

12.5.2.2 Pipelines and transmission lines

The pipelines and transmission lines would be routed along existing roads and servitudes where possible which should limit additional land needs particularly from productive lands. Where this is not possible, production would be disrupted while underground pipes are lain. It would, however, be able to continue with cultivation after this has been done and land has been rehabilitated. The seaward pipelines would be tunneled under the M4 and the land between the coastline and M4.

12.5.2.3 Mitigation

Mitigation included in project planning includes the compensation of land owners for land losses or restrictions in the form of servitudes. All amounts in this regard should be fairly determined with the help of professional independent valuers.

12.5.3 Overall project cost considerations

The proposed project would entail significant financial costs to Umgeni Water that would be passed on to its customers in the form of water tariffs. This section briefly outlines anticipated costs and considers implications for water tariffs.

The project engineers (Aurecon) generated estimates of the financial costs associated with the proposed plant and associated infrastructure as part of their feasibility study (Aurecon, 2015). Capital costs were estimated at R3.957 billion (including 20% for Preliminary and General Items, 25% for

contingencies and excluding VAT). It is also anticipated that an additional R478 million would be required for engineering fees, environmental and social costs, land acquisition, further geotechnical and survey requirements, project management and administration. Operation and maintenance costs have been estimated at R400 million/yr and these include annual operation and infrastructure maintenance, staff costs, chemical costs, membrane replacement costs and power supply.[1] The costs referenced here are likely to increase with inflation up to the point at which the project would be implemented. For the purposes of this study a baseline of 2015 was used as the most accurate costs were derived for the project during the detailed feasibility study.

12.5.3.1 Implications for water tariffs

Umgeni Water has six municipal customers, namely eThekwini Metropolitan Municipality, Ilembe District Municipality, Harry Gwala District Municipality, Umgungundlovu District Municipality, Ugu District Municipality and Msunduzi Local Municipality. It currently supplies 426 million m^3 of potable water to these customers at an average tariff of R4.97/kl for 2014. It is difficult to make accurate predictions regarding the desalination plant's impacts on increased water tariffs. Nevertheless, the following factors are relevant in this regard and are discussed below:

- The unit cost of desalination relative to other supply options.
- The volume of water to be supplied by the desalination plant relative to overall water supply levels from all the other supply options used by Umgeni Water (i.e. other dams etc.).

As part of the project feasibility study, Aurecon has estimated that an indicative water tariff of R13.45/m^3 would be required to cover the capital and operational cost of the project (Aurecon, 2015). This estimate is based solely on the sale of water from the desalination plant without mixing in of water from other sources with different costs. It is also worth bearing in mind that it is relatively approximate and highly dependent on the volumes of water which are sold against which to recover the capital costs of the desalination plant.

In order to better understand the implications of the plant for water tariffs, it needs to be viewed within the wider context of all water supplied by Umgeni Water. Desalination may be one of the higher cost options on its own. However, the plant would produce 150 Ml/day (or 54.7 million m^3 per annum) which would be roughly 13% of Umgeni Water's current total supply. This low to moderate percentage would allow Umgeni to better absorb the relatively higher cost of the desalination plant into its overall water supply cost structures.

Bear in mind that any tariff increases related to desalination would take place within a context where it is likely that tariffs will need to increase at rates above the base tariff and probably above the general rate of inflation regardless of which water supply option is implemented next. This is a common situation throughout the country and relates to new water supply options generally being more expensive relative to existing schemes which were often constructed first precisely because of their lower cost.

12.5.4 Impacts on fishing

Commercial and recreational fishing are important socio-economic activities along the majority of the KZN coastline. It is thus important to consider the potential impacts of the proposed project on these activities. The Marine Environmental Impact Assessment has taken the lead in this regard. The Marine Assessment outlines the nature of the marine environment and fishing activity in the wider area and

1 Note that given their importance to overall costs, power supply costs have been based on price increases that are 37% above the normal inflation rate up to 2027 (Aurecon, 2015).

assesses impacts on the marine environment and associated risks to fishing. This section briefly reviews the findings of the study and interprets them from a socio-economic perspective.

The Marine Assessment points out that key impacts are related to the construction of the intake and outfall structures along with the operational phase intake of feed water from the ocean and consequent discharge of a high-salinity brine back into it. It found that construction activities would be intensive, but the impacts would be highly localised and confined to the immediate construction area (Pulfrich, 2015). It was also considered likely that, with adequate mitigation, the marine communities in the localized construction areas would recover in the short to medium term after construction. For the operational phase, the hydrodynamic modelling carried out for the Marine Specialist Study indicates that the project would be associated with a sacrificial zone footprint in the order of 40 m wide by about 80 m long (the length of the 60 m-long diffuser, plus 20 m buffer beyond the last port). The zone may extend to up to 50 m from the discharge point under minimum discharge conditions. This would, however, be temporary occurring only 1% of the time. Note also that the modelled salinity levels beyond the sacrificial zone did not reach 1 psu above ambient levels at any time and scientific studies have shown that effects on marine biota are primarily observed for increases of 4 psu and above. These potential concentrations beyond the sacrificial zone were consequently not predicted to have significant negative impact on marine communities (Pulfrich, 2015).

At an overall level the Marine Assessment found that, with few exceptions, mitigation measures would reduce the negative impacts to a low significance level. This finding along with the relatively small potential sacrificial zone associated with the project indicates that impacts on fishing would be low during construction and operations with mitigation.

12.5.4.1 Mitigation and impact significance

The Marine Assessment outlines the key measures required to mitigate impacts on fishing which are not repeated here.

In addition to these measures, the applicant should undertake to inform the main commercial and recreational fishing associations (e.g. ski boat clubs) operating in the area about the nature and timing of construction and operational activities should the project proceed. This should ensure that the fishing sector remains informed limiting unnecessary confusion about the project.

Without additional mitigation (i.e. with only the mitigation measures inherent to the project design), the impacts are predicted to be of a medium negative significance during the construction phase and a medium negative significance during the operational phase.

With the effective implementation of the above key mitigation measures, impacts should reduce to a low negative significance during the construction and operational phase.

The no-go would maintain the status quo and would have no impact.

12.5.5 Impacts on tourism and recreation

Tourism plays an important role in the economy of the local area and wider region. It is thus important to consider the potential impacts of the proposed project on this sector alongside impacts on recreation. In order to assess impacts, information on current tourism and recreational use and potential future use focusing on the wider area surrounding the site was gathered. Discussions were also held with tourism stakeholders in order to get their views. These discussions confirmed that visual, marine, ecological and noise impacts were the key concerns for tourism. Pertinent information from

other specialist studies was examined, discussions were held with the specialists where necessary and an assessment of impacts was made.

12.5.5.1 The tourism and recreation context

Tourism and recreation risks would be most prominent near the plant site which is in close proximity to the coast. The proposed site is situated approximately 1.6 km from Tonagaat Beach to the north, 2.6 km from Casuarina Beach to the north and 2.5 km from Umdloti Beach to the south. These are the main swimming beaches in the local area and have the facilities to accommodate high volumes of visitors (i.e. lifeguards, ablutions and significant parking facilities). The beach area at the site is also used for swimming and sun bathing but less intensively when compared to these beaches – its essentially a lower key destination by comparison. Other beach activities such as fishing and walking are relatively common along this stretch of beach.

The closest tourist accommodation facility is the Seabelle Hotel and Restaurant roughly 100 m from the site on South Beach Road. As one would expect, the facility is oriented towards the sea and enjoys good sea views. The Hotel has 24 rooms and a staff compliment of between 30 and 40 people depending on the season including restaurant staff. There are also other guest houses relatively nearby in Desainagar / Tongaat Beach (e.g. La-Peng Guest House and Phumula By The Sea) and La Mercy (e.g. La Mercy Dunes and La Mercy Beach Hotel). Note that these are all more than 800 m from the site and would not have direct views over it.

12.5.5.2 Disruption and restricted access during construction

The construction activities for the project would be particularly intensive on the plant site which would include the pump station. The use of tunnelling for the laying of the marine pipelines would mean that access to the beach would largely be able to continue through the construction phase. It would, for example, be possible to walk along the beach and swim in the sea nearby for the majority of the construction phase as trenching on the beach would not be required. The presence of the large plant construction site nearby may, however, result in people temporarily favouring beach areas where there is less disruption and nuisance (such as noise discussed below). Kayaking and other marine/boating activities would be restricted in the immediate areas surrounding pipe laying activities which would use barges.
Note that tunneling would also maintain a low level of impacts on coastal ecology and dune stability as per the findings of the Terrestrial Ecological Assessment (Bundy, 2015).

12.5.5.3 Visual impacts

With respect to project components, the desalination plant and pump station would be the key risk factor for tourism and recreation given its substantial size and nature. The plant would also be situated in an area near the coastline where tourism and recreational uses are most common. The power lines would also be a risk factor from a visual perspective albeit a lesser one by comparison to the plant. The pipelines would not be visible once buried or submerged limiting their visual impacts primarily to the construction period associated with their installation.

According to the Visual Impact Assessment (VIA) construction activities at the plant site were found to be highly intrusive on views from the beach due to the size of the plant and its elevated position (Holland, 2017). They would be discordant with elements in existing views. As a consequence, visual impact of construction activities associated with the plant (including pump station) on sensitive visual receptors was given a high significance with mitigation in the VIA. These impacts would combine with impacts associated with the construction of the marine pipelines which would require the use of

offshore barges. Tourism risks from visual impacts during the construction are thus likely to be significant in the local area albeit temporary.

Visual impact during operations would also be a concern for local tourism given the contrast between the industrial nature and size of the plant and its potential surrounds. Risks would be focused on people engaging in tourist activities nearby and those using nearby tourism facilities such as the Seabelle Restaurant and Hotel. Note that motorists on the M4 would also include tourists. Their views would be impacted on but, as noted in the VIA, they generally pass through highly urbanised landscapes and will tend to be more focused on the sea views (Holland, 2017). With respect to the overall significance of visual impacts, the VIA concludes that:

- Landscape impact of the desalination plant on a landscape with mixed rural, residential and beach front character would have a medium significance with mitigation.
- Visual intrusion of the plant on existing views of sensitive visual receptors in the region would have a medium significance with mitigation.
- Visual intrusion of a power line from the desalination plant to the La Mercy Major Substation (Initial alignment) on the existing views of sensitive visual receptors in the region would have a medium significance with mitigation. The significance of this impact will be low if the Alternative 2 powerline route is constructed.

Although there would be some opportunity to mitigate visual impacts, the establishment of a plant of a nature and size proposed within the surrounding context would not be supportive of current tourism use or of the future development of tourism in the local area.

12.5.5.4 Noise impact

Noise impacts have the potential to impact on tourism and recreation if they are significant and impact negatively on tourism and recreation receptors and their experiences. The closest significant receptors that are focused on tourism and recreation would include the beach area along with the Seabelle Restaurant and Hotel. For these areas and others especially within 170m of the site significant noise level increases are predicted during construction. Increases during the day time are not however predicted to exceed 7 dB(A) and have thus not been classified as a "disturbing noise" (Williams, 2017). The primary reason that increases would be limited relate to existing ambient noise levels in the area particularly due to the presence of often significant traffic on the M4 and the sea nearby.

During operations, the predicted noise levels associated with the operation of the proposed desalination plant would be below current ambient noise levels for all noise sensitive areas assessed including the Seabelle and beach area. Risks to tourism and recreation from this impact are thus likely to be low with mitigation.

12.5.5.5 Marine impacts

Risks to the marine environment have the potential to result in risks to tourism given the popularity of activities such swimming, surfing and kayaking.[2] The findings of the Marine Assessment in this regard are dealt with in Section 0. Overall risks during operations were found to be low with mitigation implying that risks to tourism and recreation would also be low with mitigation.

2 Note that risks to recreational fishing are assessed in Section 0.

12.5.5.6 Mitigation and impact significance

Impacts on tourism are primarily dependent on how project operations are designed, constructed and executed to minimise negative biophysical and social impacts and enhance positive ones. The measures recommended in other specialist studies to minimise negative impacts (primarily visual, marine, noise and ecological measures) and enhance positive impacts would thus also reduce impacts on tourism and should be implemented. These measures are not repeated here.
In addition to these mitigation measures, the applicant should:

- Inform local residents and bodies representing tourism and recreation well in advance of any access restrictions and exclusion zones.
- Provide information to local media (newspapers and radio stations) informing the public of access restrictions and exclusion zones.

In order to estimate the significance of impacts, the combined effects of the risks described in the preceding section were considered relative to the tourism and recreation context.

Without additional mitigation (i.e. with only the mitigation measures inherent to the project design), the impacts are predicted to be of a high negative significance during the construction and operational phases.

With the effective implementation of the above key mitigation measures, impacts should reduce to a **medium** negative significance during the construction and operational phases.

The no-go would maintain the status quo and would have no impact.

12.5.6 Impacts on property values

Economic theory assumes that property values capture not only the physical characteristics and productive potential of properties, but also the environmental and social characteristics of their surroundings. The project's impacts discussed in preceding sections and in other specialist studies thus also have the potential to be reflected in, or impact on property values. These include primarily visual, noise, ecological and social impacts and need to be borne in mind to avoid double counting. These impacts are briefly revisited here but are not dealt with extensively as most of them have been discussed in previous sections of this report and in other specialist studies. Assessment is also partially informed by discussions with estate agents that operate in the local areas and take the potential for stigma into account.[3]

The focus here is on risk factors for primarily residential property values. However, it needs to be borne in mind that the project would augment water supplies which are critical if property values are to be maintained. In this sense, the project or any other water supply project would provide important support for property values. It is likely that the impacts of not having adequate water supply (whether from this or other alternative sources) would be more detrimental to property values in the wider area when compared to localized risks to property values brought about by the plant.

From a property values perspective, construction phase impacts are less important when compared to lasting impacts during the operational phase. Disturbances would be experienced during construction which should entail risks to the short-term saleability of surrounding property as would be the case with virtually all major construction projects. The property market is, however, likely to take its lead from permanent impacts.

3 Discussion were held with Vish Naiker (RE/MAX, Desainagar) along with Molly Frank and colleagues (Wakefields, Ballito).

With respect to project components, the desalination plant and pump station would be the key risk factor for property values given its substantial size and nature. The power lines would also be a risk factor form a visual perspective albeit a lesser one by comparison to the plant. The pipelines would not be visible once buried limiting their visual impacts primarily to the construction period associated with their installation.

12.5.6.1 The local residential property context

The site, which is currently used for small-scale agriculture, is located at Desainagar between La Mercy and Tongaat Beach. These and other residential areas can be found along the coast with the area surrounding the proposed site being one of the least developed. As per the VIA, the nearby coastal settlements tend to be characterized by an urban beachfront with hotels and holiday apartment blocks between the beach and the M4 and more permanent residential areas on the hills inland from the road. West of the site are some patches of natural vegetation and beyond that the hills are covered in sugar cane plantations up to the N2 (Holland, 2015).

The location of residential properties immediately nearby and with views of the plant site are as follows (see Figure 11-4 below):

- There are two residential properties at the southern boundary of the site along South Dune Road. These houses are oriented towards the sea. To the north east of the site there are about five residential house on the either side of Valley Road.
- The area along South Beach Road between the site and the coastline contains three houses oriented towards the sea, the Seabelle Restaurant and Hotel and properties where houses are yet to be built (currently vegetable are grown on most of these properties). There is also a cluster of five houses along South Beach Road opposite the Valley Road intersection with South Dune Road.
- King Shaka Estate is situated to the north of the plant site above Valley Road. The Estate was established 10 years ago and consists of 147 stands. Approximately 37 houses have been built on these stands thus far and an additional eight houses are currently under construction (L. Marsh, King Shaka Estate Body Corporate, pers com). The majority of the houses in the estate overlook the site and have sea views towards the south. The closest houses in the estate are about 260 m from the site border.

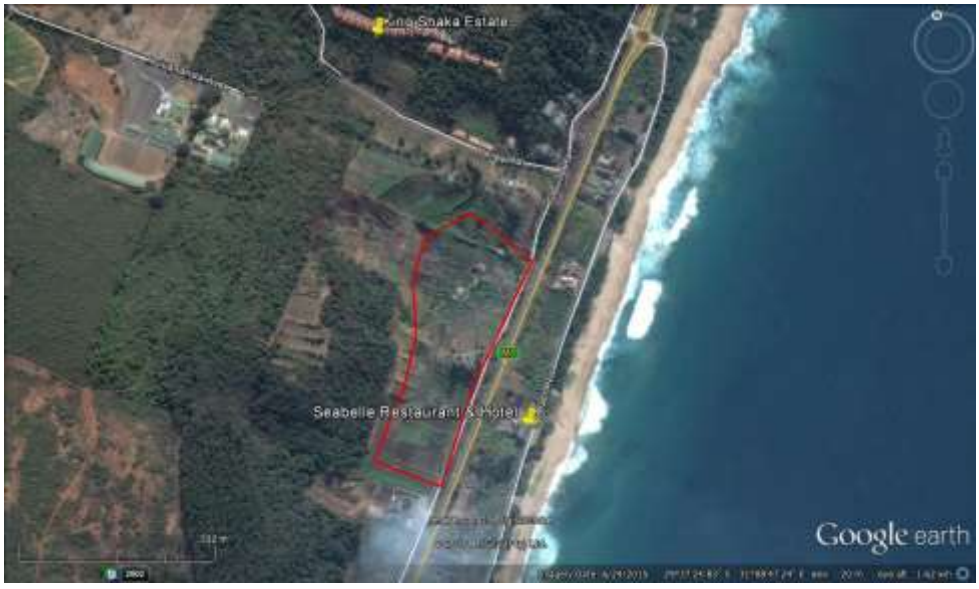


Figure 12-4: Map showing residential properties in close proximity to the site

The plant site and surrounds are well suited to future residential development given their position in an area earmarked for further growth, sea views on offer and proximity to the beach. This is recognised by estate agents operating in the area. The site is also earmarked for residential development in municipal spatial planning for the area as discussed in Section 12.5.1.2. The power lines would pass relatively close and to the west of La Mercy residential area.

12.5.6.2 Visual impacts

In addition to visual impacts discussed as a part of the assessment of impacts on tourism, the VIA provides other findings that were used to assist in the assessment of impacts on property values. These are not all repeated here. The following observations are, however, provided for areas where visual impacts are a particular concern drawing on the VIA (Holland, 2018):

- "The residences in close proximity to the desalination plant (Desainagar on the maps) were built with views of the sea in mind (i.e. large east facing windows and decks) and the desalination plant is unlikely to intrude on these views since there are no houses west of the desalination plant. One house just north of Valley Road does face the desalination plant site and if residents have sea views from here then the desalination plant will most likely cut these off completely. Very few, if any, views valued for their scenic qualities will be intruded on by the desalination plant. The desalination plant will however be discordant with other existing views due to the size and industrial nature of the development."
- "The desalination plant itself will dominate views from the Shaka Estate since most of the land now under cultivation will be replaced by buildings, structures and paved areas. The buildings associated with the desalination plant are large and many of the structures are industrial in nature. Many of the structures are tall and are likely to project into the sea views and detract from the quality of existing views. The rural aspect of these sea views will also be completely altered. A high visual intrusion on sea views from the Shaka Estate is therefore expected if a desalination plant is built here."

Key areas where visual risks to property values would be prominent would therefore include:

- King Shaka Estate and other nearby houses in Desainagar where views are directly over the site. Note that to a degree these risks would be lessened due to the elevation of the Estate above the site which would allow for the maintenance of the majority of distant view of the horizon.
- Houses along the north northern and western edge of La Mercy would also bear some risks. The closest houses in this area would, however, be 200m from the initial powerline route.

12.5.6.3 Noise impacts

As outlined in Section 12.5.5.4, noise impacts during construction would be highly significant for a number of receptors albeit temporary. Especially for areas within 170m of the site significant noise level increases are predicted during construction. Increases during the day time are however not predicted to exceed 7 dB(A) and have thus not been classified as a "disturbing noise" (Williams, 2018). The primary reason that increases would be limited relate to existing ambient noise levels in the area particularly due to the presence of often significant traffic on the M4 and the sea nearby.

For the operational phase, the Noise Assessment found that noise emissions from the main plant would be below current ambient noise levels for all noise sensitive areas assessed including nearby residential houses. Night time noise levels of at the house closest to the site adjacent to its southern border along South Dune Road (Noise Sensitive Area 3 in the Noise Assessment) would exceed the suburban night limit of 40 db(A). However, the current ambient noise at this site is higher than this level (i.e. 47.2 dB(A))

and it may therefore provide a masking effect. Noise impacts during operations have consequently been assessed to have a low level of significance for the plant site including the pump station (Williams, 2015). Risks to property values from noise are thus considered low during operations.

12.5.6.4 Impacts associated with stigma

Property value impacts tend to stem from actual bio-physical effects (e.g. visual impacts, noise, etc.) and potentially also from stigma. The latter is defined by the Appraisal Institute as "an averse public perception about a property that is intangible or not directly quantifiable". Stigma essentially comes about due to risk perceptions or "perception-driven market resistance". As it is driven by perceptions and "gut feel" it does not necessarily take all the measurable facts into account. As such it tends to emerge particularly when new land uses or projects are incompatible in some way with existing land uses and development patterns.

Estate agents and residents have expressed concern regarding the introduction of what is essentially a large industrial facility into a sea-side residential and small scale farming area that would use technology (i.e. desalination) which is not familiar in the South African context. These concerns, which include an element of stigma, are valid given the little-know nature of the technology to be used and because the project will result in higher risks relative to more compatible uses. It is instructive to consider a counter-factual to illustrate the point. For example, if a large residential development with a similar footprint and height as the plant was being proposed on the site then there would be very little, if any, risk of stigma. Such developments are a known entity and would be compatible with surrounding land uses and expectations for the area based largely on spatial planning guidance.

It is thus considered likely that the project would be associated with some level of stigma with potential negative impacts on the property market nearby. If the project does go ahead, it will be very important that the applicant institutes mitigation measures to limit the formation of ill-informed perceptions regarding the project. This should help to limit the emergence of unfounded stigma.

12.5.6.5 Mitigation and impact significance

Impacts on property values are primarily dependent on how project operations are designed, constructed and executed to minimise negative biophysical and social impacts and enhance positive ones. The measures recommended in other specialist studies to minimise negative impacts (primarily visual, noise and ecological measures) and enhance positive impacts would thus also reduce impacts on tourism and should be implemented. These measures are not repeated here.

In addition to these mitigation measures, the applicant should institute mitigation measures to limit the formation of ill-informed perceptions regarding the project which could exacerbate property market risks. This should include engagement with all of the estate agencies operational in Desainagar, La Mercy and Tongaat Beach in order to establish and meet their informational needs in order for them to more precisely understand the nature and implications of what is being proposed. It is likely, for example, that a high quality graphical representation or 3-D model of the plant would assist estate agents in understanding the project and being able to more accurate convey what the project would entail to potential buyers.

In order to estimate the significance of impacts, the combined effects of the risks described in the preceding section were considered relative to the property context.

Without additional mitigation (i.e. with only the mitigation measures inherent to the project design), the impacts are predicted to be of a medium to high negative significance during the construction phase

given its high intensity but temporary nature and a high negative significance during the operational phase.

With the effective implementation of the above key mitigation measures, impacts should reduce to a medium negative significance during the construction and operational phases. This is largely in keeping with the findings of the VIA of medium overall visual impacts with mitigation. Note that the achievement of medium impacts during operations would require particularly stringent mitigation of visual and noise impacts. Note also that impacts are not likely to the evenly spread and higher intensity impacts would be associated with the loss of views in particular.

The no-go would maintain the status quo and would have no impact.

12.5.7 Impacts associated with expenditure on the construction and operation of the project

The construction and operational phases of the project would both result in positive spending injections into the area the benefits of which are best measured in terms of impacts on employment and associated incomes. Bear in mind that at this stage of project planning estimates of expenditure and employee needs are generally tentative and not detailed resulting in a broad level of assessment.

All new expenditures will lead to linked direct, indirect and induced impacts. Taking employment as an example, impacts would be direct where people are employed directly on the project in question (e.g. jobs such as construction workers), indirect - where the direct expenditure associated with a project leads to jobs and incomes in other sectors (e.g. purchasing building materials maintains jobs in that sector) and induced where jobs are created due to the expenditure of employees and other consumers that gained from the project. Direct impacts are the most important of these three categories as they are the largest and most likely to impact on the local area. Their estimation also involves the lowest level of uncertainty. The quantification of indirect and induced impacts is a far less certain exercise due to uncertainty surrounding accurate multipliers particularly at a local and regional level. This uncertainty makes it inadvisable to quantify indirect employment unless an in-depth analysis is required. Potential direct employment impacts are consequently quantified here and likely indirect impacts are considered in a qualitative sense when providing overall impact ratings.

12.5.7.1 Construction phase impacts

Preliminary estimates indicate that a total of approximately R4.4 billion would be spent on the entire construction phase over approximately 30 months including infrastructure and building construction as well as specialised machinery installation. Bear in mind that these estimates are subject to revision and only meant to give an approximate indication of potential expenditure.
The table below outlines the applicant's upper and lower employment expectations for job creation during the construction period. It is expected that between 195 and 255 temporary jobs would be associated with the construction phase spread over roughly 30 months.

Table 12-5: Estimated direct temporary employment during construction

Skill level	Anticipated number of employees		
Unskilled and semi-skilled	150	-	200
Skilled	45	-	55
Total	**195**	**-**	**255**

In addition to the above direct employment and associated income opportunities, a significant number of temporary indirect opportunities would be associated with the project. These would stem primarily from expenditure by the applicant in the local area and region as well as expenditure by workers hired for the construction phase.

12.5.7.2 Operational phase impacts

Once established, the operation of the facility would result in direct and indirect economic opportunities. These would stem from expenditure on operations including expenditure on employees that would not otherwise have occurred particularly in the local area. It is anticipated by the applicant that operational and maintenance expenditure would rise to roughly R213 million per year escalating gradually in line with inflation. As with construction, a portion of operational needs would initially necessitate imports given limited local availability particularly of technical components and services.

Although operational expenditure would be significant, the plant would not be labour intensive. The table below outlines the operational phase employment opportunities that that would be associated with the project. Approximately 30 people would be required to operate the plant at capacity. Total salaries paid to employees would be in the order of R9.2 million per year.

Table 12-6: Employment associated with operations

Job category	Anticipated number of employees	Annual estimated salary	Total salary costs per category
Plant Manager	1	R 650,482	R 650,482
Senior Operator/Shift Manager	4	R 367,905	R 1,471,620
Operator	8	R 271,742	R 2,173,936
Instrumentation/Lab Techicians	4	R 367,905	R 1,471,620
Electrical Technician	3	R 376,905	R 1,130,715
Mechanical Technician	4	R 307,270	R 1,229,080
Laborers	5	R 152,349	R 761,745
Admin Assistant	1	R 271,742	R 271,742
Total	**30**		**R 9,160,940**

Aside from these direct employment opportunities, the operational expenditure on the project (detailed above) and the spending of those employed directly would result in positive indirect impacts on the local and regional economy. Essentially those that secure jobs on the project would spend some portion of their increased income on local goods and services generally purchased by households. This would benefit those businesses where the money is spent.

12.5.7.3 Mitigation and impact significance

Umgeni Water's policies with regard to tendering, procurement and employment should act as a departure point when considering benefit enhancement measures. In keeping with the national government guidance on which they are based, these policies should ensure that local benefit maximisation and equity goals are met.

Targets should preferably be set (in tender documents) for how much local labour should be used based on the needs of the project and the availability of existing skills and people that are willing to undergo training. Opportunities for the training of unskilled and skilled workers from local communities during construction and operation should be maximized. Local sub-contractors should be used where possible

and contractors from outside the local area that tender for work should also be required to meet targets for how many locals are given employment.

Without additional mitigation (i.e. with only the mitigation measures inherent to the project design), the impacts are predicted to be of a medium positive significance during the construction phase and a medium positive significance during the operational phase.

With the effective implementation of the above key mitigation measures, benefits would be enhanced somewhat. The overall significance ratings of impacts should, however, remain the same.

The no-go would have no impact in the locality relative to these benefits as there would be no expenditure injection. Water supply needs would still, however, need to be met even if the project does not go ahead. To a degree, expenditure that would have flowed from the project would therefore essentially be 'replaced' by expenditure on other water supply projects that will have to go ahead in order to supply water to the wider area. For this reason, impacts associated with expenditure should not be treated as a key decision factor.

12.5.8 Cumulative Impacts

Cumulative impact are defined as the impact on the environment, which results from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (CEQ, 1997). Bear in mind also that the distinction between cumulative and other impacts is often difficult to make. The assessment of cumulative impacts is also generally more difficult primarily as they often require more onerous assumptions regarding the likely actions of others.

12.5.8.1 Facilitation of further development

The project would facilitate further development in the wider area through the provision of water supply which is a pre-requisite for such development. Impacts in this regard should be of a medium to high significance. It has the potential to influence investors (including locals) to act with greater confidence with regard to water resources being available thereby resulting in cumulative impacts on overall investment levels. In a sense the project has the potential to lead to the 'crowding in' of further investment.

Concerns have been raised that the development of an essentially industrial facility in the area would open the way for more industrial development in the immediate vicinity of the site. In other words, an industrial node of sorts could form around the site. It is not possible to predict outcomes in this regard as future land use will depend on developer interest and what the Municipality approves. Residential development is, however, currently indicated in municipal planning for the area surrounding the site in keeping with its position and key advantages for residential development. Its suitability for industrial development beyond a desalination plant is thus not clear at this stage along with the potential for the development of an industrial node.

12.5.8.2 Impacts on fishing and water based recreation

Negative cumulative impacts on fishing and water based recreation are a possibility particularly when combined with other current and potential future threats to water quality. In this regard the Marine Assessment points out the (Pulfrich, 2015):

> *"Water and sediment quality have no doubt already been compromised by the various marine outfalls along the coast. Likewise, the river water shows measurable anthropogenic contamination due to discharges from wastewater treatment plants within the river's catchment areas. Therefore, given the current past and future proposed development along the coastline of the project area, cumulative impacts as well as further disturbances to marine or coastal systems or features can be expected. The magnitude and significance of these to the nearshore benthic ecosystem and potential cascade effects on higher order consumers are, however, difficult to predict and impossible to quantify. Of importance is the recognition that cumulative effects may occur and this should be kept in mind during any monitoring studies undertaken as part of this (or any other similar) project."*

Further assessment of the socio-economic impacts of these potential cumulative effects is not possible in light of these findings regarding uncertainties.

12.5.8.3 Impacts on tourism and property values

Aside from water quality consideration discussed above, cumulative impacts on tourism and property values should be driven primarily by cumulative visual, noise and ecological impacts.

For visual impacts, the visual specialist found that, "The significance of the cumulative impact on the landscape of the desalination plant and other future developments as planned in the Spatial Development Plan for the North Coastal Corridor (the area in which the desalination plant will be located) will be High Negative since the future landscape character will be low density residential and beachfront. Mitigation measures listed for the visual impact of the desalination plant will, if successfully implemented, lower the significance to Medium Negative" (Holland, 2015). It also noted that cumulative visual impacts on sensitive visual receptors would be low given future plans for the area.

The noise specialist found no cumulative impacts would be associated with the project (Williams, 2015).

The above findings focused on visual impacts indicate medium risks of cumulative impacts on tourism and property values with mitigation.

12.5.9 Decommissioning Phase Impacts

As per the Social Specialist Study (Keal, 2015) , it needs to be understood that the socio-economic environment surrounding the site is likely to change substantially over 20-25 years' time which is when decommission may be considered. This makes it impossible to give anything more than highly speculative consideration to the impacts of decommissioning at this stage. It also implies that an assessment of socio-economic impacts at the time of decommissioning would be needed.

Conceptually, decommissioning and rehabilitation of the site would essentially withdraw risks to fishing, tourism and recreation and to adjacent land users/owners and their properties although much will depend on what happens to the plant site (e.g. residential development, a recreational area, etc.). It would result in no more operational expenditure or jobs associated with the project as the project is withdrawn from the economy although the decommission process would provide a limited short term boost to decommissioning contractors.

12.6 IMPACT ASSESSMENT SUMMARY

The tables below provide a summary of the impacts and recommended mitigation measures discussed in the preceding sections.

Table 12-7: Impact assessment summary table for the Construction Phase

Construction Phase										
Impact Description	**Status**	**Spatial Extent**	**Duration**	**Reversibility**	**Potential Intensity**	**Probability**	**Significance (Without Mitigation)**	**Key Management actions (i.e. actions that are not negotiable and have to be implemented to ensure that the significance of the associated impact is acceptable)**	**Significance (With Mitigation)**	**Confidence**
Impacts on commercial and recreational fishing (direct and indirect)	Negative	Local (2)	Temporary (1)	High	High (8)	Probable (0.5)	**Medium (5.5)**	• The measures recommended in the marine specialist studies would minimise impacts. • In addition to these measures, the applicant should undertake to inform the main commercial and recreational fishing associations (e.g. ski boat clubs) operating in the area about the nature and timing of construction and operational activities.	**Low (3)**	Medium
Impacts on tourism and recreation (direct and indirect)	Negative	Local (2)	Temporary (1)	Moderate	High (12)	Highly probable (0.75)	**High (11.25)**	• The measures recommended in the visual, noise, marine and ecological specialist studies would minimise impacts. • The applicant should also: -Inform local residents and bodies representing tourism and recreation well in advance of any access restrictions and exclusion zones. -Provide information to local media (newspapers and radio stations) informing the public of access restrictions and exclusion zones.	**Medium (7)**	Medium

Impacts on property values (direct and indirect)	Negative	Local (2)	Temporary (1)	Moderate	High (11)	Highly probable (0.75)	**Medium to high (10.5)**	• The measures recommended in the visual, noise and ecological specialist studies would minimise impacts. The applicant should engage with all of the estate agencies operational in Desainagar, La Mercy and Tongaat Beach in order to establish and meet their informational needs in order for them to more precisely understand the nature and implications of what is being proposed. It is likely, for example, that a high quality graphical representation or 3-D model of the plant would assist estate agents in understanding the project and being able to more accurate convey what the project would entail to potential buyers.	**Medium (7)**	High
Impacts associated with expenditure on the project (direct and indirect)	**Positive**	**Regional (3)**	**Temporary (1)**	**Moderate**	**Medium (4)**	**Definite (1)**	**Medium (8)**	• **Use local workers and sub-contractors where possible.** • **Maximise opportunities for training.**	**Medium (8)**	Medium

Table 12-8: Impact assessment summary table for the Operational Phase

Operational Phase										
Impact Description	**Status**	**Spatial Extent**	**Duration**	**Reversibility**	**Potential Intensity**	**Probability**	**Significance (Without Mitigation)**	**Key Management actions (i.e. actions that are not negotiable and have to be implemented to ensure that the significance of the associated impact is acceptable)**	**Significance (With Mitigation)**	**Confidence**
Impacts on commercial and recreational fishing (direct and indirect)	Negative	Local (2)	Long term (4)	High	Medium (4)	Probable (0.5)	**Medium (5)**	• The measures recommended in the marine specialist studies would minimise impacts.	**Low (3)**	Medium
Impacts on tourism and recreation (direct and indirect)	Negative	Local (2)	Long term (4)	Moderate	High (10)	Highly probable (0.75)	**High (12)**	• The measures recommended in the visual, noise, marine and ecological specialist studies would minimise impacts.	**Medium (8)**	Medium
Impacts on property values (direct and indirect)	Negative	Local (2)	Long term (4)	Moderate	High (10)	Highly probable (0.75)	**High (12)**	• The measures recommended in the visual, noise and ecological specialist studies would minimise impacts. • The applicant should engagement with all of the estate agencies operational in Desainagar, La Mercy and Tongaat Beach in order to establish and meet their informational needs in order for them to more precisely understand the nature and implications of what is being proposed. It is likely, for example, that a high quality graphical representation or 3-D model of the plant would assist estate agents in understanding the project and being able to more accurate convey what	**Medium (8)**	Medium

								the project would entail to potential buyers.		
Impacts associated with expenditure on the project (direct and indirect)	Positive	Regional (3)	Long term (4)	Moderate	Low (2)	Definite (1)	**Medium (9)**	• Use local workers and sub-contractors where possible. • Maximise opportunities for training.	**Medium (9)**	Medium

Table 12-9: Impact assessment summary table for Cumulative Impacts

Cumulative Impacts										
Impact Description	**Status**	**Spatial Extent**	**Duration**	**Reversibility**	**Potential Intensity**	**Probability**	**Significance (Without Mitigation)**	**Key Management actions (i.e. actions that are not negotiable and have to be implemented to ensure that the significance of the associated impact is acceptable)**	**Significance (With Mitigation)**	**Confidence**
Facilitation of further development in the area due to the availability of water	Positive	Local (2)	Long term (4)	High	Medium to high (6)	Definite (1)	**Medium to high (12)**	• None recommended	**Medium to high (12)**	Medium to high
Impacts on tourism and property values	Negative	Local (2)	Long term (4)	High	High (8)	High probability (0.75)	**Medium to high (10.5)**	• The measures recommended in the visual specialist study would minimise impacts.	**Medium (8)**	Low to medium

12.7 CONCLUSIONS AND RECOMMENDATIONS

The assessment found that the project would be associated with the following positive socio-economic impacts:

- It should prove largely compatible with relevant water supply planning which contains clear justifications for moving to the detailed feasibility assessment and associated EIA phase for desalination whilst recognizing risks associated with high costs.
- Broad spatial planning guidance for the site indicates that it has been earmarked for residential development in the future although it is currently used for agricultural purposes. This calls for clear justifications for proposals for the site that do not entail residential development. Arguably the supply of water for residential and other purposes would qualify as a reasonable justification in this regard and seems to reflect current thinking of the eThekwini Municipality's Framework Planning Branch in this regard.
- The project would have a positive impact on economic activity given the size of the new spending injections associated with it.

Key findings with regard to risk and negative impacts were as follow:

- Impacts on fishing are likely to be low with mitigation based on the findings of the marine and estuarine specialist studies.
- Although there would be some opportunity to mitigate visual impacts, the establishment of a plant of a nature and size proposed within the surrounding context would not be supportive of current tourism use or of the future development of tourism in the local area. Overall impacts on tourism and recreation during operations have been given a medium significance rating with mitigation when considering visual impacts along with relatively lower risks from noise and marine impacts.
- Risks to property values were found to be of a medium significance with mitigation given primarily visual, noise and ecological impacts. This is largely in keeping with the findings of the VIA of medium overall visual impacts with mitigation. Note also that impacts are not likely to be evenly spread and higher intensity impacts would be associated with the loss of views in particular.

The mitigation measures contained in other specialist studies would also limit socio-economic risks. In addition, the following key mitigation measures are recommended:

- In order to limit impacts on local residents along with tourism and recreational stakeholders, the applicant should (a) Inform local residents and bodies representing tourism and recreation well in advance of any access restrictions and exclusion zones and (b) Provide information to local media (newspapers and radio stations) informing the public of access restrictions and exclusion zones.
- The applicant should institute mitigation measures to limit the formation of ill-informed perceptions regarding the project which could exacerbate property market risks. This should include engagement with all of the estate agencies operational in Desainagar, La Mercy and Tongaat Beach in order to establish and meet their informational needs in order for them to more precisely understand the nature and implications of what is being proposed. It is likely, for example, that a high quality graphical representation or 3-D model of the plant would assist estate agents in understanding the project and being able to more accurate convey what the project would entail to potential buyers.

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