

Title: Social Impact Assessment (SIA): Mooi-Mgeni Transfer Scheme Phase 2: Spring Grove Dam (SGD¹)

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¹ Refer to separate SIA (Brügge, 2007) for the Mooi-Mgeni Transfer Scheme Phase 2: Appurtenant Works: (AW).

MOOI-MGENI TRANSFER SCHEME-PHASE 2

SPRING GROVE DAM AND APPURTENANT WORKS

Social Impact Assessment (SIA): Spring Grove Dam (SGD)

EXECUTIVE SUMMARY

This report is an update of, and further additions to, the Social Impact Assessment conducted in 2002 by WRP Consulting Engineers. The subject matter is the proposed Spring Grove Dam (SGD) and allied works, excluding the transfer scheme, which is covered in a separate report - Social Impact Assessment (SIA): Spring Grove Dam Appurtenant Works (AW). The change processes and resulting social impacts of the SGD were assessed based on a number of impact variables, and rated in terms of their significance, direction (positive or negative), extent, spatial and time-scale. The construction, operational and decommissioning phases of the proposed project were assessed separately, including pre- and -post mitigation ratings for each. A brief summary is provided:

Construction phase:

The construction impacts identified are largely short-term or sporadic/intermittent: Population related impacts and the inflow of outsiders seeking jobs were rated significant (negative), noting that mitigation in the form of employing locals may not be completely successful in dissuading outsiders, potentially including illegal immigrants, from entering the area. Relocation/resettlement following expropriation and the resultant financial and psychological impacts were rated as significant (negative), bearing in mind the advanced age of the

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inhabitants (site of proposed dam wall probably requiring expropriation prior to construction). These impacts were rated as responsive to mitigation, resulting in reduction in significance.

At the level of individuals and families, impacts on movement patterns were rated as definite and significant (negative), but are expected to be sporadic. The fish-barrier; dam-wall; pump-station; road to the quarry site and local roads were identified as impact focal points, noting that impacts would present differentially, ranging potentially from a mere nuisance factor to more serious ramifications, e.g. impacts on businesses. Cumulative impacts are anticipated to intensify daily movement related impacts, should construction of these developments occur concurrently. The impacts are expected to respond to mitigation, reducing the significance to moderate. Public health and safety/security impacts commensurate with the presence of contracting firms and workers were rated as probable and high in significance (negative). Subject to successful implementation of mitigation measures, the significance would reduce to 'moderate'. Impacts on tourism and recreation due to construction activity/workers were rated as low in significance (negative) and local.

Impacts on social networks due to interference by construction workers/job seekers from elsewhere were rated as significant and possible (certainty scale). Impacts manifesting would depend on locals perceiving interference as adversely affecting their social networks and the creation of social capital, a crucial ingredient in producing safe, happy, and productive communities. Mitigation is not expected to respond to the impact in full as some elements of mitigation (disruptive influence by newcomers not forming part of the legitimate construction team) would fall outside the purview of the DWAF contractor(s).

In terms of socio-economic impacts (positive), the construction process should yield a number of job opportunities and benefit local businesses. These impacts, whilst positive, were not considered substantial compared to tourism revenue and are not sustainable, therefore, the impact was rated as moderate in significance.

Intrusion impacts, i.e. dust/air pollution; visual/aesthetic/sense of place related impacts; and noise and vibration were rated as probable and moderate in significance as well as responsive to mitigation, thus reducing the significance of the impact to low.

Operational phase

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Population impacts: Except for perceived employment prospects associated with maintenance, the project is not expected to attract newcomers into the area during operation. Whilst it could manifest, the significance of this impact is very low (negative) and the time-scale sporadic. As regards changes in the racial, ethnic, gender or age composition of the population, the proposed SGD is expected to play an important additional role over and above the existing demographic characteristics/changes of the area. Whilst potentially being a negative impact, it is anticipated that locals would expect demographic diversity among visitors or those planning to settle in the area, and therefore have the necessary coping resources necessary (by virtue of experience) to deal with any potential negative impacts. The impact has been rated as possible, negative but only moderate in significance.

Individual and family level impacts: Expropriation related relocation and resettlement impacts on property owners, employees and their families as well as people renting but working elsewhere due to expropriation, are considered of high significance, negative, permanent, and probable. The latter (rather than a rating of 'definite') serves to allow for those properties that are only partially inundated and whose owner may therefore not require relocation. The relocation related impacts should respond favorably to mitigation (compensation), reducing significance to 'moderate', bearing in mind that expropriation is not always seen as desirable. Impacts on daily movement patterns and their correlates (living patterns; socio-economic) would by far outstrip any unrelated ('natural') negative impacts (i.e. those occurring independent from the proposed project), thus calling for a high significance rating (negative; long-term; local). Impact focal points include the Vaalekop smallholdings and access roads to the property Riverholm traversing the properties Riverholm 15967 and Inchbrakie 14870. The impoundment of the SGD will affect access of farm labourers and their families (south-north). Mitigation is expected to be complex and/or expensive or not feasible in certain instances and also result in 2nd order impacts (e.g. impacts on Farmworker Housing and a Dairy: Inchbrakie Farm).

Maintenance during the operational phase is not expected to generate significant public health and safety impacts. Flood related impacts (negative) were rated as possible, albeit low in significance, given that it is long standing DWAF policy to add a buffer strip to the calculated high flood level (1:100 year). Given assurances that the buffer strip will compensate for any uncertainties regarding the estimated 1:100 year high flood line, reducing or negating impacts, the significance has been reduced to very low, post-mitigation.

Impacts on tourism and recreational activities: The proposed SGD is expected to have a positive impact on tourism and recreational activities in the immediate vicinity as well as the Midlands Meander as a whole. It is expected to play an important role in making the area an even more desirable destination, the impacts being rated as definite in certainty; moderate in significance and long-term. Negative impacts resulting from maintenance activities have been rated as possible, but very low in significance. Negative impacts on fishing in the upper reaches of the Mooi River due to the displacement of the Brown Trout by the Smallmouth Bass (due to inundation of the Inchbrakie Falls) would be highly significant, negative, long-term and regional in scope. However, the construction of a properly designed weir upstream from the Falls would render the impact nil, according to the research quoted.

Impacts on social networks resulting from impediments to movement, due to the impoundment have been rated as probable, moderate in significance, negative and long-term. Following mitigation, a significance rating of low has been allotted whilst the certainty has been adjusted to 'possible'.

Impacts on community resources: infrastructure and land use impacts are considered highly significant, permanent, negative and local. The impacts (property dependent; partial vs. full inundation) on infrastructure would extend to daily living (e.g. accommodation; communication; water; electricity; sanitation and access) as well as farming activity. Following successful mitigation, the significance of the impact can be re-adjusted to moderate. Extensive inundation would call for complete expropriation of the properties affected (see section on relocation/socio-economic impacts). However, even partially or minimally affected farms could become non-viable in terms of current land uses, requiring land to be sold or used for other purposes. Compared to other impacts and full expropriation, minimum or partial inundation is seen to be moderate in significance, but long-term and negative. Financial compensation is expected to be a mitigation measure reducing the impact to low in significance, post-mitigation. Many of the affected properties (e.g. subdivided portions of the farms Spring Vale and Vaalekop) within the proposed SGD basin are dependent upon water abstracted from the river for domestic and agricultural purposes. Being unable to do so, may render the properties unviable/not meeting requirements for daily living. In these instances, the impacts have been rated as definite, high in significance and permanent. Following mitigation, and bearing in mind that supply can only be secured by current lawful water users as per DWAF policy, the significance can be reduced to moderate, the impact becoming unlikely (at least as far as legitimate water users are concerned: alternative supply to others should be investigated and secured). Furthermore,

the specific situation of the MRIB would require attention going forward, bearing in mind that a separate economic study conducted found that the net reference value of water (Unit Reference Value) for the Mooi Transfer Scheme is R1.20 per cubic metre against R4.20 per cubic metre (Mkomazi River). Assurance of future water supply for current irrigation farmers was also identified as a positive impact in the study.

Land claims and tenant claims: *Given contradictions in the information provided by the Land Claims Commission (KZN) in 2003 and July 2007 respectively and given that some information could not be verified, this variable was rated “possible” although significance could not be determined (rated as “CAN’T KNOW”).*

The proposed SGD is expected to have a positive socio-economic impact (mainly derived from knock-on effects: tourism and recreational spending) in the immediate vicinity as well as the Midlands Meander as a whole. The most prominent, dramatic and far-reaching, albeit indirect, positive socio-economic impact of the proposed SGD will be through sustained provision of water to KZN, including Durban, and Pietermaritzburg. The construction of the dam will result in the unlocking of more development (including low-income housing in Rosetta/Nottingham) which is hamstrung due to the lack of water provision to peri-urban and rural areas. In rating the positive impacts, the proposed SGD and its impact on tourism and recreational activities must be placed within the context of the current characteristics of the area which is already strongly tourism orientated and features the Midmar Dam. The positive impacts are rated as definite and highly significant. The negative impacts would result from inundation of the Inchbrakie Falls and displacement of the Brown Trout by the Smallmouth Bass. The potential socio-economic losses to the economy of the Nottingham Road, Rosetta/Kamberg and Midlands Meander have been rated as significant, long-term and regional in scope. However, mitigation by means of a properly designed weir would effectively render the impact ‘nil’. A further highly significant (moderate: post-mitigation) negative impact resulting from the operational phase of the SGD would be the retrenchment of farm employees due to expropriation; land-use changes incompatible with skills or land being sold off. While the retrenchment of farm workers is possible, it is difficult to determine prospectively (impacts would depend on full vs. partial expropriation; land-uses changes; re-skilling, etc). Further to the above, a separate socio-economic study found that employment will be lost in the donor catchment. However, the receiving catchment will produce, directly and indirectly 185 job per Mm³ (million cubic meters) of water. This is significantly higher than can be achieved in the donor catchment. The jobs expected to be lost were, therefore, rated as low in significance.

Community institutional arrangements: an assessment of the record of I&AP inputs (comment sheets; minutes; interview data) against two important markers of social sentiment, i.e. attitude formation and interest group activity, did not yield information suggesting global opposition to the project. Negative attitudes were selective, and inter alia related to the inundation of the Inchbrakie Falls and the lack of clarity on the expropriation/compensation process. Opposition against the proposed SGD was vocalized by the Mooi River Farmers Association. Whilst Local Government and the SAPS expect the proposed SGD to have institutional implications, it offers the opportunity to secure resources that would benefit the area as a whole and to meet Constitutional obligations. The SGD is therefore viewed in a positive light and the institutional implications as being 'par for the course'.

Intrusion impacts: During operation of the proposed SGD, dust and air pollution impacts are unlikely. Noise and vibration impacts are expected to be limited to maintenance activity; the river flow gauging weirs and the pump-station at the proposed SGD. Significance is rated as low, the impact being possible, bearing in mind the possibility of 2nd order impacts resulting from the use of the water surface. Given that all areas in which the SGD infrastructure is to be installed already show signs of development, although some are more cluttered with artifacts of human inhabitation than others, the SGD is expected to have a smaller aesthetic/visual and sense of place related impact compared to what would have been the case in pristine localities (current existence of big and small dams offer some point of reference/familiarity). However, given that the SGD would inundate (depending on the impoundment level) another prominent and cherished natural feature, i.e. the Inchbrakie Falls, would call for a high significance rating (certainty: probable; time-scale: long-term). Mitigation is not readily attainable: Whilst the dam, as a quasi-natural feature might offset some of its artificial features (wall; measuring weirs; pump-station), a conservative rating would be appropriate, the significance and probability (post-mitigation) only being reduced to moderate (certainty: probable).

Decommissioning phase

The most remarkable and significant negative impacts associated with the decommissioning of the dam (if and when it happens) would relate to the socio-economic and tourism sectors (permanent; very high in significance; and unresponsive to mitigation). De-construction related impacts (positive and negative would generally range from moderate to low

significance). On the positive end of the spectrum, decommissioning of the SGD would free up land (after rehabilitation) which may be made available for other productive uses (if feasible). This is only a possibility, the significance being moderate (positive). Decommissioning of the SGD (if and when it happens) would have an adverse impact on water abstraction, thus impacting domestic and farming uses. This is particularly the case if abstraction from the Mooi River is no longer an option. The resulting impacts are rated as possible, the significance very high (negative), as mitigation would be unachievable. Intrusion impacts have been rated as follows: dust and air pollution: probable and moderate in significance; 'noise/vibration impacts': probable but of low significance (very low following mitigation). Decommissioning of the SGD would nullify any positive visual/aesthetic or therapeutic impacts, but also remove some of the negative impacts, e.g. by restoring the Inchbrakie Falls. Such impacts (positive and negative) are rated as definite and the significance as very high and not responsive to mitigation.

By means of an overarching comment it is emphasized that second-order impacts resulting from the community's response to the proposed SGD rather than only the dam itself (the 1st order impacts), will bring about many significant impacts with further consequences. These include property divisions (rezoning), which, if not subject to proper consideration by the authorities vis-à-vis current land-uses in many areas (agricultural zoning), could tip the balance, and irrevocably alter the current rural sense of place, which defines the area notably along the Kamberg Rd.; and the Bend.

In conclusion it is noted that the proposed SGD will probably bring about a number of change processes and impacts much more significant and remarkable than could be attributed, over time, to the 'natural' progression of time and associated social change processes/impacts. This relates to both the physical and social environment. These and lesser impacts, both positive and negative, are the subject of this report.

Recommendations:

Based on the results, the recommendations are as follows: (1) Careful consideration and implementation of mitigation measures. Specific attention should be paid to the compensation and expropriation process, with specific emphasis on the relocation/resettlements needs of farm-worker and their families; properties that face partial inundation; infrastructure and land use impacts; as well as daily movement and social network related impacts; (2) the specific situation of, and potential impacts on, the Mooi River Irrigation Board and its members be addressed by DWAF once the way forward

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(including independent review of a DWAF report), as agreed during a Focus Group meeting with the MRIB, has been attained; and (3) creation of a Mitigation Monitoring Committee (MMC) comprising affected parties, the project proponent; Environmental Monitoring/Control Officer (EMO); Local Government; SAPS/CPF and the DWAF contractor, should be formally established. This committee should monitor the implementation and impact mitigation process, using the EMP as basis.

MOOI-MGENI TRANSFER SCHEME PHASE 2

SPRING GROVE DAM AND APPURTENANT WORKS

Social Impact Assessment (SIA): Spring Gove Dam (SGD)

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LIST OF ACRONYMS

BCR	Benefit Cost Ratio
CPF	Community Policing Forum
DWAF	Department of Water Affairs and Forestry
EPEP	Emergency Preparedness and Evacuation Plan
EMP	Environmental Management Plan
EIA	Environmental Impact Assessment
FSL	Full Supply Level
HDSA	Historically Disadvantaged South-Africans
I&APs	Interested and Affected Parties.
IAIA	International Association for Impact Assessment
IRR	Internal Rate of Return
MASL	Meters above mean sea level
MMC	Mitigation Monitoring Committee
MRIB	Mooi River Irrigation Board
NEMA	National Environmental Management Act.
SAPS	South African Police Services
SGD	Spring Grove Dam.
SGTS	Spring Grove Transfer Scheme
SMME	Small, Medium and Micro Enterprises
SIA	Social Impact Assessment

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- ii. The fine and detailed work of WRP Consulting Engineers, who conducted the initial SIA (2002), and which formed an important and sound basis for this report, is hereby acknowledged.
- iii. The socio-economic study conducted by Conningarth Economists (October 2007), entitled: "Issues in relation to the appropriateness of the Mooi-Mgeni Transfer Scheme Phase-2 in the Mgeni Water Supply Master Plan", is hereby acknowledged.

1. PROJECT SCOPE

The scope² of this SIA is the Spring Grove Dam (SGD), which is described below. The ‘appurtenant works’ (excluding the Quarry site) referred to in the title of this report is the subject of a separate SIA report (Mooi-Mgeni Transfer Scheme Phase 2: Appurtenant Works (AW). The chief motivation for the separation of the SGD and the AW is that the social impacts differ substantially in many instances, making joint description and rating thereof untenable.

The “full supply level (FSL) of 1 433.50 masl” referred to under the project description below accords with “Scenario B” (revised FSL) described in the SIA of the Mooi Mgeni Transfer Scheme: Phase 2 (WRP Consulting Engineers, October 2002), the review and updating of which is the subject of this report. “Scenario B” defines the scope of this assessment, noting that in contrast to the original FSL and buffer zone (Scenario A), the “magnitude of impacts is significantly reduced” (ibid. at p3-4).

2. PROJECT DESCRIPTION (SGD)

- The dam site and dam basin area below the 1437 masl contour, which extend up into the Mooi River for about 13 km up to Tunga Falls, which is located about 1.5 km upstream of Inchbrakie Falls, and includes all the affected properties that will be fully or partly inundated. **[Note: The 1437 masl contour is the approximate “buffer line” for the dam. The “buffer line” is a line either 1.5m above or 15 m away from the estimated 1:100 year high flood line, whichever gives the greater horizontal distance away from the high flood line. The high flood line is the calculated backwater effect of the 1:100 year flood event for a dam with a 60m long spillway and a full supply level (FSL) of 1 433.50 masl. The spillway length is not yet fixed and as a result the current levels of the “buffer line” may change slightly if another spillway length should be adopted during the detail design stage.]**
- The proposed fish barrier weir site is situated about 1.5 km upstream of Inchbrakie Falls on the Mooi River on the property Vaalekop 3297/47, commonly known as ‘Coldstream’. The weir can be sited anywhere within a 100m stretch of the river of which the higher site would create the highest impact and the lowest site the lesser impact on the upstream riverine

² BKS (12 March 2007).

ecology and riparian properties. The crest level of the downstream weir is 1440.6 masl and that of the upstream weir 1443.0 masl. The lower site is therefore favoured. An environmental investigation has, however, been conducted for the basin of the upstream site and with a “buffer line” assumed as the 1448 masl contour. The “buffer line” of the downstream site is much lower at approximately the 1446 masl contour. The basin lengths of the downstream and upstream sites are 2.3km and 3.3km, respectively. *[Note: The backwater influence of the 1 in 100 year flood extends to 1448.6 masl contour a distance of about 3.3km upstream from the upstream weir site. Upstream of this point the flow conditions in the river are natural and not affected by the weir.]*

- The access roads to the Vaalekop South Smallholdings and the property Riverholm traversing the properties Riverholm 15967 and Inchbrakie 14870.
- The road from Nottingham Road to Loteni on the property Spring Grove where an embankment section of the road could be affected by the dam during high flows.
- The Rosetta Village and surroundings that could be impacted upon during construction (impacts that relate to the SGD).
- The proposed quarry on the properties Springvale 2170 (20% affected) and Wellington 2212 (80% affected).

3. METHODOLOGY

A description of the methodology with respect to the SIA follows in the sub-sections below.

3.1 DEFINITION OF AN SIA

The following served as operational definitions for the SIA:

- According to the International Association for Impact Assessment (IAIA), “impact assessment, simply defined, is the process of identifying the future consequences of a current or proposed action”³.
- Becker (1999) defines a Social Impact Assessment as: a process that serves to identify the future consequences for human populations of any public or private action that alters the way in which people live, work, play, relate to one another, organise to meet their needs, and generally cope as members of society”.

³ IAIA (2001), available on-line.

- Vanclay (2002, p. 190), defines SIA as follows: “Social impact assessment is the process of analysing (predicting, evaluating and reflecting) and managing the intended and unintended consequences on the human environment of planned interventions (policies, programs, plans, projects) and any social change processes invoked by those interventions so as to bring about a more sustainable and equitable biophysical and human environment”.

3.2 PRINCIPLES

The following informed the SIA by way of guiding principles

3.2.1 IAIA

- (a) “Equity considerations should be a fundamental element of impact assessment and of development planning.
- (b) Many of the social impacts of planned interventions can be predicted.
- (c) Planned interventions can be modified to reduce their negative social impacts and enhance their positive impacts.
- (d) SIA should be an integral part of the development process, involved in all stages from inception to follow-up audit.
- (e) There should be a focus on socially sustainable development, with SIA contributing to the determination of best development alternative(s) – SIA (and EIA) have more to offer than just being an arbiter between economic benefit and social cost.
- (f) In all planned interventions and their assessments, avenues should be developed to build the social and human capital of local communities and to strengthen democratic processes.
- (g) In all planned interventions, but especially where there are unavoidable impacts, ways to turn impacted peoples into beneficiaries should be investigated.
- (h) The SIA must give due consideration to the alternatives of any planned intervention, but especially in cases when there are likely to be unavoidable impacts.
- (i) Full consideration should be given to the potential mitigation measures of social and environmental impacts, even where impacted Communities may approve the planned intervention and where they may be regarded as beneficiaries.
- (j) Local knowledge and experience and acknowledgment of different local cultural values should be incorporated in any assessment.

- (k) There should be no use of violence, harassment, intimidation or undue force in connection with the assessment or implementation of a planned intervention.
- (l) Developmental processes that infringe the human rights of any section of society should not be accepted: (IAIA, 2003, p.6).

3.2.2 NEMA

NEMA provides a framework for integrating good environmental practices into development activities. The environmental principles are summarized below:

- (a) Environmental management must put people and their needs at the forefront, and must serve their interests fairly.
- (b) Development must be socially, environmentally and economically sustainable. This means that the potential of the following occurring must be considered before development proceeds:
 - disturbance of eco-systems and loss of biodiversity;
 - pollution and degradation of the environment;
 - disturbance of landscapes and sites where the nation's cultural heritage is found;
 - production of waste must be minimised or avoided;
 - non-renewable resources must be used responsibly;
 - the precautionary principle must be applied;
 - negative impacts must be anticipated and prevented and if they can't be prevented they must be minimized or remedied;
- (c) Environmental management must be integrated. The best practical environmental option must be pursued.
- (d) Environmental justice must be pursued so that there is not unfair discrimination in the way that negative environmental impacts are distributed.
- (e) There should be equitable access to environmental resources, benefits and services to meet basic human needs. Special measures may be taken to ensure access for persons disadvantaged by unfair discrimination.
- (f) Responsibility for environmental health and safety of any policy, programme or project must continue throughout the life cycle of a project.
- (g) Public participation in environmental decision making must be promoted. The participation of vulnerable and disadvantaged groups must be ensured.

- (h) Decisions must take into account the interests, needs and values of all interested and affected parties. This includes recognizing all forms of knowledge including traditional and ordinary knowledge.
- (i) Community well being and empowerment must be promoted through environmental education.
- (j) The social, economic and environmental impacts of the activities must be assessed.
- (k) The rights of workers to refuse to do work that are harmful to human health or the environment and to be informed of dangers must be respected.
- (l) Decisions must be taken in an open and transparent manner and access to information provided in accordance with the law.
- (m) There must be inter-governmental co-ordination and harmonization of policies and laws.
- (n) Actual or potential conflicts of interest between organs of state must be resolved through conflict resolution procedures.
- (o) Global and international responsibilities relating to the environment must be discharged in the national interest.
- (p) The environment is held in a public trust for the people, and the use of environmental resources must serve the public interest, and be protected as the people's common heritage.
- (q) The polluter must pay for the costs of remedying pollution, environmental degradation and adverse health impacts.
- (r) The vital role of youth and women in environmental management must be recognized and their full participation promoted.
- (s) Sensitive or stressed eco systems must receive special attention in planning which might affect them especially when they are subject to significant resource usage and development pressure.

3.3 SPECIFIC OBJECTIVES

3.3.1 Initial SIA (October, 2002)

The socio-economic assessment conducted during 2002 is comprehensive and finely-grained in the manner in which notably property and infrastructure related impacts were quantified and described in terms of what were initially two Scenarios, viz. "Scenario A" and "Scenario B". Impacts relating to community well-being; social networks; employment opportunities; movement patterns; historical/cultural heritage and recreational fishing were also quantified

and/or described. The associated mitigation measures also form a good basis for further study and expansion. In view of the comprehensive manner in which inundation levels were calculated and impacts quantified and qualified, the initial SIA can be considered a solid basis. This is notably the case since the Dam's footprint (as per DWAF Terms of Reference (August, 2006)) seems to coincide with what was described and analyzed as "Scenario B" (1433.50 m.a.s.l), the magnitude of which seems smaller than "Scenario A".

In view of the above and in terms of the updating of the SIA, it is taken that the initially calculated percentages of inundation per property and impacts on infrastructure/roads will probably remain the same.

3.3.2 Review and updating of SIA

The specific objectives of this SIA were to:

- i. Update the SIA for the Mooi-Mgeni Transfer Scheme Phase 2 (WRP Consulting Engineers, October, 2002), with specific emphasis on the following:
 - Determine whether additional infrastructure and super-structure that was put in place since 2002, including the potential *sub-division of land* and *new developments*. Such updating was based on interviews with affected parties and other sources, including minutes from public meetings and GIS data. Surveying and counting of infra- and super-structure, including pipe and cable lengths formed part of the SIA conducted in 2002 fell outside the scope of this SIA. The information from the SIA conducted in 2002 was used.
 - Determine whether any land claims have been received in the study area and their implications.
 - Determine lawful entitlements for water use and the resultant need for special mitigation as well as the implications of the sub-division of land;
 - Determine changes in property values and their implications;
 - Determine impacts on local government;
 - Determine impacts relating to the proposed quarry, fish barrier weir; and access road related issues further to those covered in the initial SIA.
 - Update the socio-economic data for application to the proposed Springrove Dam SIA update and the SIA of the proposed transfer infrastructure.

- ii. Identify, describe and assess the prevailing positive and negative impacts in respect of the SGD during the construction, operation and decommissioning phases. (The data on I&AP's issues, concerns, attitudes and perceptions (current and previous) as well as other secondary data, including demographic and socio-economic data, served as 'raw data' input to this process).
- iii. Identify cumulative impacts;
- iv. Generate mitigation measures in respect of each of the impacts identified, including the identification of impacts or variables that may not be responsive to mitigation and would therefore have to be avoided. Caveat: Mitigation measures, whilst potentially being successful in attenuating impacts, can result in other undesirable side-effects, that cannot always be anticipated, as they are the function of human interaction and the patterns of relationship that exist or are altered as a result of such measures.

3.4 RESEARCH PROCESS

3.4.1 Secondary Research

i. **Rationale for baseline analysis in respect of SIA**

Authors such as Branch, Hooper, Thompson and Creighton (1984) emphasize the importance of a *baseline assessment and projection* in enabling a logical and theoretically sound analysis of social impacts. Baseline *analysis* (current demographic and socio-economic conditions) and *projection* (predicted future conditions without a project) also forms part of the steps of a Social Impact Assessment set out in the IAIA Guidelines and Principles Document (May, 1994). Baseline conditions can be defined as “the *existing conditions* and *past trends* associated with the human environment in which the proposed activity is to take place...for construction projects, a geographical area is identified along with the distribution of special populations at risk”⁴. (p. 15). Baseline projection is defined as the “predicted condition without the actions (project)” (p. 18).

⁴ The dimensions of a baseline analysis are set-out in Appendix A, for the benefit of the reader.

The chief motivations for the inclusion of a baseline analysis (see separate report: Appendix B) are as follows:

- The baseline analysis and projection is integral to the definition of Social Impact Assessment: "...impacts are defined as the difference between the...future of the affected human environment with versus without the proposed project" (IAIA Guidelines & Principles Document, May, 1994).
- Neither the natural nor the human environment are static, and undergo changes over time (even in the absence of a project).
- The impacts of a proposed action can only be determined properly if distinctions are drawn between it and other unrelated factors that come into effect over time (or are already in existence). The baseline analysis and projection therefore served to contextualize the analysis and rating of impacts associated with the SGD, commensurate with the basic principle that social impacts can vary in intensity or severity as a function of *project setting* (and more specifically the social environment, including prevailing perceptions and attitudes as well considerations such as demographic profile, including potential vulnerable groupings).
- Cumulative impacts, defined as the incremental impacts of an action, i.e. the SGD added to past, present, and reasonably foreseeable future actions.

ii. **Report Reviews**

The report review included:

- All DWAF technical reports pertinent to the Mooi-Mgeni River Transfer Scheme (Phase 2).
- The EIA and SIA Reports and associate appendices;
- Allied information such as the public participation records.

3.4.2 Phase II: Primary Research

The following served as primary data sources for the SGD SIA:

- Individual interviews were held with key stakeholders; I&APs and representatives of I&APs;
- Information gathered during site visits held 5 January 2007 and the week of 2-4 May 2007, and which included the proposed Spring Grove dam site, transfer infrastructure and affected properties.
- Minutes from public meetings.
- The I&AP issues register (current) and Issues Report from 2002.

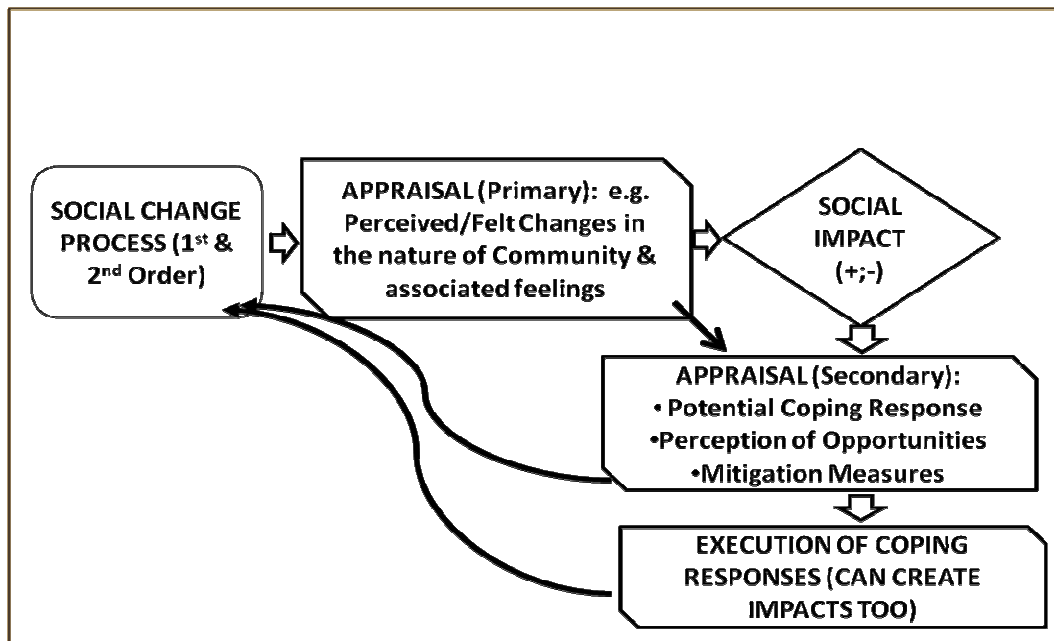
3.4.3 Impact Variables

The impacts were described on the basis of a number of variables (adapted from Burdge, 1995). Whilst these variables are termed ‘impacts’ in certain instances (see below), their manifesting as such would depend on:

- the characteristics and history of the host community (hence the ‘baseline analyses’ provided under each section);
- I&APs perception of change processes (see below) and whether they are seen to manifest as impacts.
- the availability of potential coping responses, which lead to a re-appraisal by I&APs of change processes, therefore influencing the extent to which these are perceived as impacts (see Figure below). Executing these responses is defined as coping with the impacts⁵. Such coping responses can include planning and taking active steps to get rid of the impacts (can include mitigation measures) or to benefit from them (e.g. repositioning farm businesses to become tourism ventures); seeking social support; learning to live with the impact(s); positive reinterpretation and growth (e.g. finding positive aspects related to the change processes). Social change processes are those that can be directly attributed to the proposed SGD and appurtenant works. They can lead to many other second- and higher-order change processes. For example, affected properties owners can sub-divide the remaining portions of their properties and turn these into tourism ventures that capitalize on the proposed SGD. Or, farm-workers that are retrenched may return to rural areas which can have socio-economic impacts if they fail to secure employment.
- the efficacy of mitigation measures proposed (these play an important role in the process of I&APs re-appraising the initial change processes).

⁵ Carver, Scheier, and Weintraub (1989).

Figure 1: Social Impact Assessment: Process Definition©



As Vanclay (2002) correctly points out:

“if ‘social impact’ refers to the impacts actually experienced by humans (at individual and higher aggregation levels) in either a physical or cognitive (perceptual) sense, then many impact variables commonly measured in SIA studies—for example, population growth, presence of construction workers, etc.—are *not impacts but change processes that lead to impacts*” (my emphasis). An increase in population or the presence of strangers, are not the ‘felt’ impacts. Instead, the impacts that will likely result from these change processes are changed perceptions about the nature of the community (communityness, community cohesion), changed perceptions about personal attachment to the community, and possibly annoyance and upsetness as a result of the project” (pp.191ff).

In view of the above, it is more appropriate to view the variables below as change processes which are assessed in terms of their potential to create social impacts. The process of determining I&APs’ perceptions and attitudes commensurate with the AW related change processes; the characteristics of the community; and other information, allows for social impacts to be determined. The following impact variables were applied:

- **Population related change processes and associated impacts**, including population change, inflow of temporary workers.
- **Individual and family level change processes and associated impacts**, including disruption in movement patterns, disruption in social networks; tourism and leisure impacts; and relocation of individuals and families.
- **Public health, safety and security related change processes and associated impacts**
- **Community/institutional arrangements' related change processes and associated impacts**, including attitude formation and interest group activity; impacts on Local Government and policing service.
- **Community infrastructure related change processes and associated impacts**, including change in community infrastructure, land acquisition and disposal.
- **Socio-economic change processes and associated impacts**: job creation; impacts on local businesses; and SMME development.
- **Intrusion related change processes and associated impacts**, including air pollution, noise pollution, light pollution, visual pollution and malodour pollution.

3.4.4 Change process/impact Focal Points

Change process/impact focal points are indicated under each of the impact assessment variables, denoting where the particular change processes and the assessed impact are likely to be concentrated.

3.4.5 Assessment and Rating of Impacts

To ensure uniformity across the various specialist studies and to facilitate comparison of impacts, the following rating approach was used:

i. Significance Rating Scale

The significance scale embraces the notion of extent and magnitude, but does not always clearly define these since their importance in the rating scale is relative. The significance scale is always indicated in CAPITAL letters. This scale included the following:

- **VERY HIGH:** Of the highest order possible within the bounds of impacts which could occur. In the case of adverse impacts: there is no possible mitigation and/or remedial activity, which could offset the impact. In the case of beneficial impacts: there is no real alternative to achieving this benefit.

- **HIGH:** The Impact is of substantial order within the bounds of impacts, which could occur. In the case of adverse impacts: mitigation and/or remedial activity is feasible but difficult, expensive, time-consuming or some combination of these (and could give rise to 2nd order impacts). In the case of beneficial impacts: other means of achieving this benefit are feasible but they are more difficult, expensive, time-consuming or some combination of these.
- **MODERATE:** The impact is real but not substantial in relation to other impacts, which might take effect within the bounds of those, which could occur. In the case of adverse impacts: mitigation and/or remedial activity are both feasible and fairly easily possible. In the case of beneficial impacts: other means of achieving this benefit are about equal in time, cost, effort, etc.
- **LOW:** The impact is of a low order and therefore likely to have little real effect. In the case of adverse impacts: mitigation and/or remedial activity is either easily achieved or little will be required, or both. In the case of beneficial impacts: Alternative means for achieving this benefit are likely to be easier, cheaper, more effective, less time consuming, or some combination of these.
- **VERY LOW:** The impact is negligible within the bounds of impacts that could occur. In the case of adverse impacts: almost no mitigation and/or remedial activity is needed, and any minor steps which might be needed are easy, cheap, and simple. In the case of positive impacts: alternative means are almost all likely to be more beneficial, in one or a number of ways, than those that the project is expected to accrue.
- **NO IMPACT:** No impact exists at all - not even a very low impact.

Two additional categories were also applied, where relevant. These are in addition to the category represented on the scale, and if used, will replace the scale:

- **CAN'T KNOW:** The consultant believes an assessment is not possible even with additional research.
- **DON'T KNOW:** The consultant cannot make an assessment given available information.

ii. **'Temporal' of Time Scale**

The following temporal or time scale (which is always underlined) was used:

RATING	DESCRIPTION
<u>Intermittent/Sporadic (Spor.)</u>	The impact is expected to occur sporadically or intermittently.
<u>Short-term (S.T)</u>	The impact identified will operate for the duration of the construction phase (proposed projects; other developments) or a period of less than 5 years, whichever ever is the greater.
<u>Long-term (L.T.)</u>	The impact identified will operate for the duration of life of the SGD.
<u>Permanent (Perm.)</u>	The impact will be permanent.

iii. **Certainty Scale**

The certainty of an impact occurring, based on the available information, was rated as per a sliding-scale:

- **Definite:** The impact will definitely occur (free of all ambiguity).
- **Probable:** The impact will probably occur (supported by evidence strong enough to establish presumption but not proof).
- **Possible:** It is possible that the impact will occur, i.e. it may or may not occur.
- **Unlikely:** The impact is not likely to occur.

iv. **Spatial Scale**

The following spatial scale (always in *italics*) was used:

RATING	DESCRIPTION
<i>Global</i>	The impact is expected to be of global extent.
<i>National</i>	The impact is expected to be felt at the national level.
<i>Regional (Reg.)</i>	The spatial scale is expected to be felt at a regional scale, here defined as ranging from the Midlands Meander region to the province as a whole.
<i>Local (Loc.)</i>	The impact is expected to affect an area of 5-15km from any given point of the project area/site.
<i>Site</i>	The impact is expected to affect an area no bigger than the immediate project site.

v. **Direction of impact**

Impacts are rated as either positive or negative.

vi. **Cumulative Impacts**

For purposes of this study, cumulative impacts were defined as the incremental impacts of an action, i.e. the SGD added to past, present, and reasonably foreseeable future actions. This process is informed by the baseline analysis and projection.

4. SOCIAL IMPACT ASSESSMENT (SIA)

The change processes and associated impacts are relevant to the construction/ decommissioning and operational phases, respectively, of the proposed SGD project. Compared to the construction process, decommissioning is expected to generate similar change processes and impacts as described in the forthcoming sections.

4.1 POPULATION RELATED CHANGE PROCESSES / IMPACTS

Context:

- › **This variable serves as a basis to assess:** Any impacts on the populations that are anticipated to be a consequence of the SGD.
- › **Thumbnail⁶ sketch of baseline conditions:**
 - **Population growth:** 5%-6% (uMngeni and Mpofana Municipal areas, respectively);
 - **Population size** (Census, 2001): 36 820 (Mpofana Municipal Area: site of the proposed Spring Grove Dam and origin of the SGTs); 73 896 (uMngeni Municipal area: site of the break pressure tank and origin of the outfall servitude);
 - **Employment:**
 - 39.5% of the population in the Mooi Mpofana Municipality is employed, whilst 31.3% is unemployed and 29% is economically not active. According to the 2001 Census Data, South Africa's employment rate is estimated at 34% and unemployment rate at 24%. 42% were not economically active (2001 Census data).

⁶ For further socio-economic data refer to Appendix B (separate report). Figures likely to be too conservative/dated given that the area is 'booming' (uMngeni Municipality, May 2007).

- 44% of the population between the ages of 15-65 years in the Umngeni Municipality is employed, whilst 23% is unemployed and 32% is not economically active (2001 Census data).
- **Tourism:** The Natal midlands region is considered a significant tourism hub within the KZN province.
- **Housing developments in the study area (KZN Dept. of Housing: 2005-2007 Projections):**
 - Mpofana Municipality: Kamberg (220 sites); Rosetta (120 sites);
 - Umngeni Municipality: Nottingham Road (400 sites).

4.1.1 Inflow of job seekers

i. Construction Phase

(a) Nature and extent of change process and impacts

This variable revolves around the inflow of job seekers attempting to secure employment at the proposed MMTS-2 project: SGD. Whilst such inflow is expected from surrounding areas and the province as a whole, foreign job seekers are also anticipated. Research⁷ shows that economic factors play a role in the migration of people from countries such as Mozambique, Lesotho and Zimbabwe to South Africa to seek employment, secure a higher living standard and capitalize on economic prospects. Current indications⁸ are that some 500 people will be involved in the construction of the proposed Spring Grove Dam and AW. Even if it is the intent of the DWAF appointed contractors to source construction workers locally, it is unlikely to discourage people from elsewhere entering the area. It is this perceived prospect of employment opportunities, fuelled by potential rumours about the number of jobs to be created that would attract outsiders. Furthermore, introducing job opportunities into a resource-starved environment (see unemployment figures) is a potential source of competition between unemployed locals - a situation that would be exacerbated by outsiders, potentially resulting in conflict – the felt impact of the change process. From the perspective of criminals, a construction project of this nature (proposed Dam and AW) would mean opportunities to ply their 'trade' - a concern raised by the Nottingham Rd. SAPS and CPF.

⁷ Solomon, 1996.

⁸ Project Information Video shown at 1st Public Meeting, 16 April 2007.

(b) Cumulative Impacts

For purposes of this study, cumulative impacts are defined as the incremental impacts of an action, i.e. the proposed MMTS-2: SGD project added to past, present, and reasonably foreseeable future actions.

The planned new developments (applications received), some of which appear to be emerging on the back of the proposed Spring Grove Dam⁹, are considered to be relevant as “present and foreseeable future actions”. Many are high income residential and tourism developments and the total of 1950 units (and growing) is considered sizable (IDP, January 2005). These are considered associated cumulative impacts which can be added to the MMTS-2: SGD and are expected to create an even greater impetus for job seekers to enter the area in search for employment.

This variable has been rated as follows:

Degree of certainty: Probable; **Significance:** HIGH; **Direction:** negative; **Time-scale:** short-term; and **Spatial scale:** *local*.

The following considerations serve as motivation for the rating:

- The unemployment rate in the Mpofana Municipal area (IDP Review, February 2006), which incorporates Mooi River and Rosetta (situated only kilometres from the proposed project). Unemployment and poverty were also cited as the main objectives in the uMngeni Municipality Integrated Development Plan (January, 2005).
- The magnitude of the Spring Grove Dam and associated AW (total cost in excess of R 350 000 000¹⁰);
- Cumulative or second-order impacts arising from developments set to capitalise on the proposed SGD.

(c) Change process and impact Focal Points

The following are considered the impact focal points:

- primarily the mooted dam site-office and material storage area from which

⁹ According to input from I&APs.

¹⁰ Project Information Video shown at 1st Public Meeting, 16 April 2007.

construction activity is to be managed – probably Springvale 233 and Springvale 234; and

- settlements (e.g. Mooi River Township; settlement at Rosetta accommodating mostly immigrants from Lesotho) which would serve as accommodation areas for newcomers and allow convenient access to the proposed project site
- private properties, farms and businesses.

(d) Mitigation

The following mitigation measures could be considered:

- An ongoing, broad-based information campaign to clarify the contractor's intent to source labour locally (both during construction and operation). Local community-based structures should be engaged in dissemination information in this regard.
- A transparent recruitment drive aimed at locals, including existing SMMEs and notably HDSAs.
- Securing the services of foreigners that have scarce skills not available locally, using the quota of work permits on offer at the Department of Home Affairs.
- Proactive engagement by the project proponent with local authorities/SAPS/CPF to address impacts such as proliferation of informal housing structures and associated impacts on water and sanitation infrastructure and the local socio-economic base (also crime).

(e) Post mitigation impacts

In anticipation of the successful implementation of the mitigation measures above, the rating can be adjusted as follows:

Degree of certainty: Probable; **Significance:** MODERATE; **Direction:** negative; **Time-scale:** short-term; and **Spatial scale:** *local*.

Note: Mitigation of impacts related to the AW is the primary consideration of the project proponent/appointed contractors. Therefore, such measures are not expected to mitigate cumulative impacts related to other projects, even though these may, to a degree, arise in anticipation of the Spring Grove Dam.

ii. Operational Phase

In terms of the operational phase of the MMTS-2: SGD the rating for the variable '*inflow of job seekers*' has been adjusted as follows.

Degree of certainty: Possible; **Significance:** VERY LOW; **Direction:** negative; **Time-scale:** sporadic/intermittent and **Spatial scale:** *local*.

The main motivation for this rating is that except for perceived employment prospects commensurate with maintenance, the proposed project is not expected to attract newcomers into the area. Maintenance is expected to be undertaken by existing DWAF personnel or their contractors. Therefore, employment prospects are expected to be extremely limited.

iii. Decommissioning Phase

Decommissioning of the AW is not expected to attract newcomers into the area at a level similar to the construction process, given that employment prospects would be more limited. The variable, '*inflow of job seekers*' has therefore been adjusted as follows.

Degree of certainty: Possible; **Significance:** LOW; **Direction:** negative; **Time-scale:** short-term and **Spatial scale:** *local*.

If required, mitigation measures proposed above can be applied.

4.1.2 Changes in the age, gender, racial or ethnic composition of the population

i. Construction Phase

(a) Nature and extent of change process and impacts

An inflow of people from other countries in search of employment, rather than locals from surrounding communities and rural areas would be the main change process under this variable. If locals perceived this inflow as adverse and a destabilising factor, or if conflict between residents and newcomers results, this change would qualify as impacts.

Due to reported¹¹ hostility by locals against them, communities of foreigners have been established largely along national lines, and do not span nationality divisions. They exist as discrete networks, representing particular nationalities. These communities serve the purpose of safe havens and comfort zones for them. “Company and mutual protection, rather than long-term assimilation, are the central criteria for these local migrant communities. There is no permanence or long-term stability about them”. This lack of assimilation of foreigners into local communities has adverse effects on the creation of social capital¹² - described as the 'glue that holds a community together'. Social capital includes a person's membership of groups and institutions, ability to access authorities such as local government and social networks, including religious participation with others. A favorable relationship exists between social capital and lower crime rates¹³. It is a crucial ingredient in producing safe, happy, and productive communities¹⁴.

Since 1980, more than 10.3 million foreigners entered South Africa legally but did not depart/declare their departure. The number of foreign stayers is now at over 85,000 per month from 65,000 last year and 44,000 in 2000. The SA population growth per month is only 41 000. Consequently, there are twice as many foreign stayers than South Africans¹⁵.

Whilst the exact figures and consequent changes in the composition of the population cannot be determined, even with further research, the following rating accrues based on the discussion above:

Degree of certainty: Probable; **Significance:** HIGH; **Direction:** negative;
Time-scale: short-term; and **Spatial scale:** *local*.

¹¹ Harris, 2002.

¹² Social capital consists of networks and norms that facilitate collective action. The dimensions of social capital include horizontal kinship or professional ties, as well as vertical ties that enable interactions with authorities (Woolcock, 1998, pp.151-208).

¹³ Palmary, September, 2004.

¹⁴ Woolcock, M. 1998.

¹⁵ Schüssler, 2006.

(b) Change process and impact Focal Points

Those individuals entering the area from elsewhere are likely to seek accommodation in areas which would allow easy access to the main construction terrain/site of the proposed dam wall (being Springvale property 02170/233). Proliferation of informal housing due to existing affordable housing shortages cannot be precluded.

(c) Mitigation

The following mitigation measures could be considered:

- An ongoing, broad-based information campaign to clarify the contractor's intent to source labour locally (both during construction and operation). Local community-based structures should be engaged in dissemination information in this regard. (Identity documents alone should not be accepted as proof, give reports that the Department of Home Affairs is "leaking ID documents")¹⁶.
- A transparent recruitment drive aimed at locals, including existing SMMEs and notably HDSAs.
- A recruitment drive aimed at legitimate foreigners with scarce skills (see Dept. of Home Affairs quotas).

(d) Post-Mitigation Impacts

Subject to the successful results of the implementation of the mitigation measures above, the rating can be adjusted as follows:

Degree of certainty: Probable; Significance: MODERATE; Direction: negative, Time-scale: short-term, and Spatial scale: local.

ii. Operational Phase

During the operational phase of the MMTS-2: SGD, an influx of people is expected to foster *changes* in the 'age, gender, racial or ethnic composition of the population'. The whole midlands region and Meander can be considered an impact focal point. This influx (change process) would include tourists/visitors (transient and season dependent, including weekend visitors) as well as those wishing to settle in the area permanently¹⁷. The proposed SGD is expected to play an important *additional* role

¹⁶ Schüssler, 2006.

¹⁷ Property Magazine, October 2005.

over and above the existing characteristics of the area (which include the Meander and the Midmar Dam, inter alia), in attracting visitors. Whilst potentially being a negative impact, it is anticipated that locals would expect demographic diversity among visitors or those planning to settle in the area. By virtue of precedent (existing experience in interacting with outsiders) they are expected to exhibit the adaptive and coping resources necessary to deal with any potential negative impacts resulting from changes in demographic 'mix'. Given that the change process and resulting impacts are not novel and already a reality (unrelated change processes manifesting over time¹⁸), this variable has been rated as follows:

Degree of certainty: Possible; **Significance:** MODERATE; **Direction:** potentially negative; **Time-scale:** long-term and **Spatial scale:** *regional*.

Any negative impacts are not expected to be responsive to mitigation. Mitigation may in fact not be desirable given that demographic diversity would be commensurate with the tourism-focus of the area, something that proposed SGD would contribute to.

iii. Decommissioning Phase

Decommissioning of the SGD is not expected to attract newcomers into the area at a level equal to the construction process, given that employment prospects would be limited. Hence, population change process and resulting impacts are expected to be low. The variable, '*changes in the age, gender, racial or ethnic composition of the population*' has therefore been adjusted as follows.

Degree of certainty: Possible; **Significance:** LOW; **Direction:** negative; **Time-scale:** short-term and **Spatial scale:** *local*.

If required, mitigation measures proposed above can be applied.

¹⁸ See section on description of baseline analysis.

4.1.3 Relocation of individuals and families

i. Construction Phase

(a) Nature and extent of change process and impacts

The construction process of the MMTS-2: SGD will bring about tangible social impacts in the form of relocation of individuals and families. More specifically, the positioning of the proposed dam wall would affect five buildings (comprising one farm house and four other buildings) on *Sub 234 of Springvale 2170* (impact focal point). From maps provided and the input from DWAF, it is evident that the magnitude of the dam wall and the surface area to be inundated (see operational phase) would necessitate the relocation of the inhabitants, including labourers and those renting on the property. This would have financial consequences, both in terms of current income sources (includes farming), relocation costs and future livelihood. Noting that the current inhabitants are elderly people, their coping ability would have to be considered, bearing in mind that the stress (impact) experienced commensurate with the relocation related change process, would be a function of:

- individual vulnerability, resilience and coping capacity/strategies;
- whether the process of relocation is congruent or incongruent with personal needs and expectations (current and prospective); and
- the context and associated stressors, e.g. characteristics of the new (resettlement) environment, including similar or different accommodation (size and quality); distance to work/shops; income generation potential and access to places of worship and social networks.

This variable has been rated as follows:

Degree of certainty: Definite; **Significance:** HIGH; **Direction:** negative;
Time-scale: short-term; and **Spatial scale:** *local*.

Whilst the actual process of relocation is rated as 'short-term' above, i.e. until such time that the affected parties would have resettled, the psychological consequences thereof are difficult to rate due to their subjective nature.

(b) Mitigation

The following mitigation measures are recommended:

- careful surveying and the quantification of:
 - the land, productive land uses, infrastructure, superstructures (e.g. dwellings) and relocation/resettlement related costs (including those of tenants/labourers);
 - all inhabitants living on the property, including labourers, their families/dependents and people renting but working elsewhere. The unique situation of each need to be considered.

Ideally the land-owners should secure the services of an independent assessor, arriving at consensus based outcome with the assessors from the Department of Water Affairs.

- financial compensation of affected property owners/tenants, employees and their families in terms of the relevant legislation, including the Expropriation Act and National Water Act. This should be done in consultation with the affected parties, including farm labourers facing retrenchment and tenants renting but not working on the property. The necessary clarity is to be provided by the project proponent as to the process of relocating, resettling and compensating retrenched employees and their families, and most importantly, time-frames. As has been noted during a recent public meeting, property owners need clarity on the expropriation time-frames in order to plan further productive uses of the land.
- dissemination of information on organizations that could provide counseling or support (e.g. Life Line, KZN; Church groups) to help mitigate the psychological impacts of relocation, including occupational change and loss of employment / income as well as sense of place. The manner in which the process of expropriation is approached will play an important role in either attenuating or exacerbating these impacts. A process approach taken should reflect empathy and understanding on behalf of the project proponent for the losses faced by affected parties, rather than just hammering-out the technical aspects and arriving at outcomes.

(c) Post mitigation impacts

The relocation related impacts should respond favorably to mitigation, at least as far as the tangible considerations are concerned. Following successful mitigation, the rating can be adjusted as follows:

Degree of certainty: Definite; **Significance:** MODERATE; **Direction:** negative; **Time-scale:** short-term; and **Spatial scale:** *local*.

ii. Operational Phase

The operational phase of the MMTS-2: SGD will bring about tangible social impacts in the form of relocation of individuals and families, including owners, employees and their families as well as people renting but working elsewhere. A description of properties¹⁹ whose inhabitants will probably face expropriation due to the impoundment and dam related works follows below (refer to other sections of this report for socio-economic and infrastructure related impacts). This includes both permanent residents as well as those using the properties for holiday purposes. In the case of the latter, relocation/resettlement and the resultant impacts (practical; financial; psychological) are also considered relevant. Impacts on properties without dwellings, and which are used for day visits (e.g. fishing) or camping are discussed under community recreational and/or infrastructure related impacts (see forthcoming headers).

- **Sub 234 of Springvale 2170:** Even though this property will not be completely inundated, the proposed dam wall is set to span a significant part thereof, including farm buildings. The property has therefore been earmarked for expropriation in total, requiring relocation of the inhabitants. Compensation amounts would have to cater for loss of buildings (comprising one farm house and four other buildings) and loss of existing farming derived revenue (livestock).
- **Sub 226 of Springvale 2170:** This property will be totally inundated, affecting all infrastructure and superstructure and requiring relocation of the inhabitants, including employees.

¹⁹ Adapted from WRP Consulting Engineers (October, 2002) and augmented through site visits, interviews with I&APs and other data sources, e.g. comment and registration sheets.

- **Subs 113 and 227 of Springvale 2170:** Whilst Sub 113 will not be affected, the greater part of Sub 227 will be inundated, including the main farmhouse. *If* the owners decide to resettle elsewhere, as opposed to moving to the adjoining Sub 113 (not affected), relocation and resettlement related impacts would manifest, requiring compensation.
- **Remainder, Subs 2, 7 & 9 of Eberburg 2210:** Whilst Subs 7 and 9 will not be affected, some 64% of the remainder of this property will be inundated including residential accommodation (farmhouses, 12 labour accommodation units, and three miscellaneous buildings). Given the nature of these and other impacts, e.g. inundation of farm dams, boreholes/pumps, a concrete water reservoir, water supply and irrigation pipelines, this property could be rendered economically unviable, thus requiring relocation of the inhabitants.
- **Subs 1, 2 & 3 of Riverholm 15967:** As a farm entity, approximately 59% of this farm will be inundated, with approximately 95% of Sub 1 and 60% of Sub 2 expected to be affected by the impoundment, respectively. (The remaining “unaffected” portion of Sub 2 will not form a peninsula and could therefore possibly be utilized for agricultural/other activities). Two tenant labourer accommodation units will be inundated, as well as other infrastructure. In view of the above it is anticipated that the property will become economically unviable (except possibly for Sub2) in terms of the current land-use, thus requiring relocation of the inhabitants.
- **Remainder of Riverholm 15967 (ex-Riverholm Stud):** Approximately 65% of this property will be affected, including six farm labourer accommodation units. In view of the significant surface area affected, the relatively small unaffected eastern section of the property as well as inundation of portions of the farm road, expropriation and relocation of the inhabitants would appear necessary.
- **Remainder of Inchbrakie 14850:** Approximately 50% of the property, including a large number of buildings, i.e. a large thatched house, cottage, workshop, storage shed and labourer accommodation unit. Given the expected extent of inundation of this property, including the Inchbrakie Falls as well as resulting accessibility constraints due to the impoundment, expropriation of this property and relocation of the inhabitants would appear necessary. The owners are upset about the loss of the dwelling and the proposed inundation of the

Inchbrakie Falls, and have confirmed ongoing legal representation to secure the necessary relief²⁰.

- **Sub 29 (of 15) of Vaalekop 3297:** Some 94% of this property will be affected, rendering the current land-uses unviable. Since the property is used for recreational purposes, relocation to an area with similar benefits would be appropriate.
- **Sub 30 (of 15) of Vaalekop 3297:** About 93% of the property falls within the recommended purchase line, thus requiring relocation of the inhabitants (bearing in mind that the property itself is used as a holiday home).
- **Subs 35, 39, 40 & 43 (of 15) of Vaalekop 3297:** These properties are used for weekend and vacation accommodation: Whilst Sub 35 will not be affected, the entire Sub 39, 40 and 43, respectively, will be inundated. A farmhouse and other buildings, including farm labourer accommodation units will be affected. Relocation to the unaffected Sub 35 rather than further afield is a possibility and should be clarified with the affected parties.
- **Sub 38 (of 15) of Vaalekop 3297:** Approximately 76% of this property (permanent residence) will be affected. Given the impact on irrigated pastures, dwellings and farming infrastructure, the proposed development will probably render the property economically unviable, also necessitating relocation of the inhabitants
- **Sub 42 (of 15) of Vaalekop 3297:** Approximately 94% of this property serving as a permanent residence, will be inundated including the access road, dwellings and farm infrastructure. Relocation/resettlement of the inhabitants would be necessary.
- **Sub 14 of Vaalekop 3297:** About 78% of this property falls within the recommended purchase line. Extensive impacts on infrastructure, a saw mill, and farming activity (growing of feed for stud horses), are expected to render this property unviable, probably necessitating relocation/resettlement of the inhabitants and farming operation. Securing a comparable property for purposes of stud farming is, according to the owner, anticipated to cost 8-10 million rand.

²⁰ Pers comm., May 2007.

- **Wellington 2212** (undeveloped), one of the proposed quarry sites (80% affected), may have to be expropriated due to the extent in which it would be impacted. (Rehabilitation following completion of the project may be possibility).

Further to the financial considerations, the stress (impact) experienced commensurate with the relocation related change process, would be a function of:

- individual vulnerability, resilience and coping capacity/strategies;
- whether the process of relocation is congruent or incongruent with personal needs and expectations (current and prospective); and
- the context and associated stressors, e.g. characteristics of the new environment, including similar or different accommodation (size and quality); distance to work/shops; income generation potential and access to places of worship and social networks.

Bearing in mind that the nature and extent of inundation of properties above differs, affecting the expropriation and relocation process (change process), the impact - i.e. relocation of individuals and families, whether on- or off- site calls for the following rating:

Degree of certainty: Probable²¹; **Significance:** HIGH; **Direction:** negative; **Time-scale:** permanent; and **Spatial scale:** *local*.

(b) Mitigation

The following mitigation measures are recommended:

- careful surveying and the quantification of:
 - the land, productive land uses, infrastructure, superstructures (e.g. dwellings) and relocation/resettlement related costs (including those of tenants/labourers);
 - all inhabitants living on the properties, including labourers, their families/dependents and people renting but working elsewhere. The unique situation of each need to be considered.

Ideally the land-owners should secure the services of an independent assessor, arriving at consensus based outcome with the assessors from the

²¹ A probable as opposed to 'definite' rating serves to allow for those situations where relocation may not be necessary due only to partial or minimal inundation (see section on 'Community Resources').

Department of Water Affairs. Whilst the total project costs for compensation for land, building and infrastructure had been calculated at nearly R 30 million (WRP Engineers, October, 2002, p.7-1), I&APs have gone on record (Public Meeting, 16 April 2007) stating that this amount was vastly insufficient. Recalculation of these costs by the project engineers and quantity surveyors is therefore required given the time that has lapsed as well as information to the effect that “the value of property in the KZN Midlands has rocketed and the trend continues almost unabated, whether permanent residences or weekend getaways” (Property Magazine, October, 2005).

- financial compensation of affected property owners, employees and their families in terms of the relevant legislation, including the Expropriation Act and National Water Act. This should be done in consultation with the affected parties, including farm labourers facing retrenchment and tenants renting but not working on the properties. The necessary clarity is to be provided by the project proponent as to the process of relocating, resettling and compensating retrenched employees and their families, and most importantly, time-frames. As has been noted during a recent public meeting, property owners need clarity on the expropriation time-frames in order to plan further productive uses of the land.
- rehabilitation of the quarry sites.

Whilst the property owner will relocate using the compensation payment received, relocating and resettling workers and their dependents requires an equitable policy, principles, financial guidelines and clarification of operational approaches. As the MMTS-2 SIA conducted in October 2002 (WRP Consulting Engineers), correctly states, compensation packages should go beyond monetary compensation and include options that provide access to opportunities (see section on socio-economic impacts), including:

- facilitating access to new housing and/or providing assistance in drawing-down provincial housing subsidies for those that meet the eligibility criteria;
- compensatory land;
- monetary compensation, including relocation costs;
- construction of or assistance with the construction of community or multi-purpose facilities in areas where farm labourers are to be relocated to.

- o dissemination of information on organizations that could provide counseling or support (e.g. Life Line, KZN; Church groups) to help mitigate the psychological impacts of relocation, including occupational change and loss of employment / income as well as sense of place.

The manner in which the process of expropriation is approached will play an important role in either attenuating or exacerbating these impacts. A process approach taken should reflect empathy and understanding on behalf of the project proponent for the losses faced by affected parties, rather than just hammering-out the technical aspects and arriving at financial outcomes.

(c) Post mitigation impacts

The relocation related impacts should respond favorably to mitigation, at least as far as the tangible considerations are concerned. Following successful mitigation, the rating can be adjusted as follows:

Degree of certainty: Probable; **Significance:** MODERATE; **Direction:** negative; **Time-scale:** short-term; and **Spatial scale:** *local*.

iii. Decommissioning Phase

No relocation related impacts would manifest during the decommissioning phase of the MMTS-2: SGD.

Table 1: Summary Table of Population Impacts: Construction Phase

Impact Variable	Certainty		Significance		Direction (+;-)		Time Scale		Spatial Scale	
	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.
Inflow of job seekers	Probable	Probable	HIGH	MOD.	-	-	S.T.	S.T.	Loc.	Loc.
Changes in population composition	Probable	Probable	HIGH	MOD.	-	-	S.T.	S.T.	Loc.	Loc.
Relocation of individuals/families	Definite	Definite	HIGH	MOD.	-	-	S.T.	S.T.	Loc.	Loc.

**KEY: MOD.= Moderate; + (Positive); - (Negative); S.T.= Short-Term; Reg.= Regional
Loc.=Local.**

Table 2: Summary Table of Population Impacts: Operational Phase

Impact Variable	Certainty		Significance		Direction (+;-)		Time Scale		Spatial Scale	
	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.
Changes in population composition	Probable	N/A	MOD.	N/A	- ²²	N/A	Long-term	N/A	Reg.	N/A
Inflow of job seekers	Possible	N/A	VERY LOW	N/A	-	-	Sporadic/ Intermittent	N/A		
Relocation of individuals / families	Probable	Probable	HIGH	MOD.	-	-	S.T.	S.T.	Loc.	Loc.

KEY: Pre-Mt.= Pre-mitigation; Post-Mt.= Post-Mitigation.

Table 3: Summary Table of Population Impacts: Decommissioning Phase

Impact Variable	Certainty		Significance		Direction (+;-)		Time Scale		Spatial Scale	
	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.
Changes in population composition	Possible	N/A	LOW	N/A	-	-	S.T	S.T.	Loc.	Loc.
Inflow of job seekers	Possible	N/A	LOW	N/A	-	-	S.T.	N/A	Loc.	Loc.
Relocation of individuals / families	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

²² Potentially negative.

4.2 INDIVIDUAL AND FAMILY LEVEL CHANGE PROCESSES / IMPACTS

Context:

- ▶ **This variable seeks to assess:** Any impacts attributed to the MMTS-2: SGD which will have an impact at the level of families and individuals.
- ▶ **Thumbnail sketch of baseline conditions:**
 - **Road infrastructure:** The R103 (parallel alternate route to the N3) is in need of maintenance²³. The P27-30 (Loteni/Sani Pass road) is an important paved local access road. The road runs from the R103 in Nottingham Road at the Police Station to Lower Loteni. Other district roads of importance in terms of the MMTS-2: SGD are gravel roads. According to an I&AP, trucks traverse local roads (e.g. R103) to avoid toll-fees on the N3.
 - **Safety and Security:** The reported crimes, per police station, are set-out in a separate report. In summary, it is evident that, in the case of:
 - **Nottingham Road**, crime (across categories) has generally *increased* from 2001-March 2006. This includes those crimes that have been discussed in the impact assessment below, i.e. burglary at business and residential premises; robbery and stock theft;
 - **Mooi River**, crime (across categories) has *decreased* from 2001-March 2006.
 - **Rietvlei:** crime (across categories) has generally *increased* from 2001-March 2006. This includes those crimes that have been discussed in the assessment below, i.e. burglary at business and residential premises; robbery and stock theft.
 - **Latest statistics:** According to the Centre for Justice and Crime Prevention²⁴, the countryside is more dangerous than cities, noting that “in KZN, few murder occur in the Durban City centre, compared with the Midlands...”.

²³ KZN Department of Transport (2004). White Paper on Freight Transport Policy.

²⁴ Sunday Times, 22 April 2007.

4.2.1 Change processes and impacts related to daily movement patterns

i. Construction Phase

- **Nature and extent of change processes and impacts**

In terms of impacts on daily movement patterns (construction phase), a number of roads are of particular importance as change process focal points relating to daily population movement:

- **Farm and access roads to access the proposed fish barrier construction site upstream from the Inchbrakie Falls;**
- **Farm and access roads to access the proposed SGD dam wall and pump-station;**
- **District road D146 (gravel)**, which the pipeline will cross upon exiting the pump-station at the Spring Grove dam. Road D146 feeds into Kamberg Road at a T-junction close to Rosetta Village as well into Road 103 (connecting Rosetta and Nottingham Village). It is anticipated that construction vehicles would exit at Road D146 travel a few meters down/alongside Road 103 towards Rosetta Village and then turn right across Road 103 into a gravel road leading up to the proposed Quarry site. This gravel road passes under the railway line. Some five houses are situated alongside this gravel road.
- **District Road D682 (parallel with D146)**, which the pipeline will traverse. A number of properties are situated alongside this road. Off the D682 is a narrow, one lane road. Twenty residential properties are situated on this road. According to an I&AP, the entry-point from the side-road is steep and slippery and children use a footpath at the end of the road to go to school.
- **The haul road to and from the quarry across the R103 and via the D146.**

Change processes would result from construction vehicles accessing, crossing and using roads during construction of the proposed SGD dam wall, pump-station, and proposed fish barrier. The disruption of daily movement patterns (the impact) on the roads mentioned, as a result of change processes associated with construction, would obtain in the case of: **(1)** the general population, e.g. individuals on their way to work; parents taking children to school; children walking to school; or people on their way to local towns and beyond; **(2)** tourists visiting/traversing the area; and **(3)** businesses taking their products to market or farmers going about their farming

activities (intra-farm movement). Impacts would present differentially for these groups, ranging potentially from a mere nuisance factor giving rise to frustration, to more serious ramifications where farming activities are impeded, deadlines play a role or goods are being transported. In the words of one I&AP: “Many of our local residents run home-based businesses, some of whom are situated on or in close proximity to the access routes. These residents will inevitably suffer financial loss by reduction of business through current and potential customers not being able to get to the premises concerned, as well as financial losses due to increased wear and tear on their vehicles caused by the deteriorating road infrastructure”.

(b) Cumulative Impacts

The planned new developments (applications received), some of which appear to be emerging on the back of the proposed Spring Grove Dam²⁵, are considered to be relevant as “present and foreseeable future actions”. Many are high income residential and tourism developments situated in the uMngeni Municipal area and the total of 1950 (and growing) units are considered sizable (IDP, January 2005).

The above and other developments are considered change processes that can manifest as cumulative impacts when added to the SGD. They are anticipated to intensify daily movement related impacts, should construction of these developments and the SGD occur concurrently. This variable has been rated as follows:

Degree of certainty: Definite; **Significance:** HIGH; **Direction:** negative; **Time-scale:** sporadic; and **Spatial scale:** *local*.

The following serve as key motivations for this rating:

- Roads earmarked for use by construction vehicles and/or construction of the proposed SGD, fish barrier and pump station serve as main access roads to and from surrounding farms; residential properties and businesses;
- Road 103 from Nottingham Road to Rosetta roads has high traffic volumes and is generally not well maintained and considered an accident hot-spot.

²⁵ According to inputs from I&APs.

(e) Change process and impact Focal Points

The main impact focal points (and associated internal / access roads), excluding those properties expected to be expropriated (e.g. Springvale 2170/234), include:

- **Access to proposed Fish barrier:** (1) Rem. Inchbrakie 14850 (across wetland); (2) Vaalekop 3297/46; and (3) Vaalekop 3297/49.
- **Dam-wall:** Sub 7 & 8 of Rosetta 2983.
- **Pump-station:** Springvale 2170/233.
- **Quarry site:** Residential dwellings (old railway houses) situated along the dirt road to the proposed quarry;
- **Roads:** Properties along, and pedestrian / motorists using roads such as the D103 (notably the crossing point from the D146 to/from the proposed quarry); Kamberg Rd.; P27-20 (Loteni Rd.); and the D682.

(c) Mitigation Measures

The following mitigation measures, which are expected to intervene between the change processes and impacts, are recommended:

- Where temporary road closures are inevitable, the dates and times should be sign-posted well in advance at the entrances and exists of the affected roads, and alternative routes indicated;
- Where construction is expected to take a period of time, suitable and safe detours should be created.
- When accessing farms, access gates must be closed and impacts by construction vehicles on farming activities, including grazing pastures must be prevented.
- Points-men/women should be deployed to direct the traffic, where single lanes of roads remain operational or where construction vehicles need to access or cross roads. This is of particular importance in the following instances:
 - where district road D146 meets Road 103, and which construction vehicles are anticipated to cross to access the gravel road leading to and from the quarry site;
 - along the D146 and notably the entry/exit point at the proposed dam wall (Springvale 2170/234);

- T-junction from the D146 into Kamberg Rd.
- Access point from the P27-30 to the Streathearn and Riverholm Farms.

(c) Post mitigation impacts

The impacts relating to daily movement patterns should respond favorably to mitigation. Whilst all mitigation measures are expected to be effective, it should be noted that, compared to the district roads, no short-term alternative intra-farm access roads (aimed at preventing movement/farming related impacts) to the proposed fish barrier construction site, are available.

Following successful mitigation, the rating can be adjusted as follows:

Degree of certainty: Probable; **Significance:** MODERATE; **Direction:** negative; **Time-scale:** sporadic/intermittent; and **Spatial scale:** *local*.

Note: Mitigation of impacts related to the proposed SGD and appurtenant works is the primary responsibility of the project proponent/contractor. Therefore, such measures are not expected to attenuate cumulative impacts (see above) associated with other projects.

ii. Operational Phase²⁶

(a) Nature and extent of change processes and impacts

The change process during the operational phase of the proposed SGD is expected to relate to the dam constraining access to settlements; farmers being cut off from portions of their farms; and movement patterns of farm workers being impeded. The resultant *impact* can range from socio-economic consequences (portions of farms becoming inaccessible and therefore unviable; motor vehicle operating costs resulting from using longer, alternative routes) to mere frustration due to longer trip lengths. Paying attention to specific change process and impact focal points as well as their nature and extent, the following is evident:

- **Loteni Rd:** The Loteni/Sani Pass road (P27-30) is an important paved local access road that will be impacted on the remainder of Spring Grove No. 2169. Furthermore, its alignment on Sub 3 of the farm Riverholm No. 15967 is very close to the delineation line of the recommended purchase

²⁶ Adapted from WRP Consulting Engineers, October, 2002.

line. It would be prudent to ensure that the proposed SGD does not affect it at this point with consequences for movement patterns during the operational phase and notably during potential floods.

- **Vaalekop small holdings on the South bank of the Mooi River:** Access to the subdivided portions of the farm Vaalekop No. 3297 located on south bank of the Mooi River will be impacted. The location of these small holdings is indicated in **Appendix A (“Scenario B”)**. The current access is by means of a right-of-way servitude in favour of the applicable subdivided portions. Six small holdings (sub 45-49) and the Inchbrakie Farm (14850) will be affected.
- **Vaalekop smallholdings on the North bank of the Mooi River:** Access to the Vaalekop smallholdings located on the North bank of the Mooi River, and particularly those located on the lower section of the hillside, will be affected. Excluding properties that are completely inundated or rendered unfeasible for development, there are no remaining properties that will be hampered by inaccessibility as a result of the inundation of the access roadway.
- **Access roads to the property Riverholm traversing the properties Riverholm 15967 and Inchbrakie 14870:** The owner of Inchbrakie has a registered servitude for right of way on the property Riverholm while the Vaalekop South Road Association has a registered servitude for right of way on Inchbrakie where the road needs to be relocated in two areas. The unaffected portion of land on Riverholm farm located in the western portion of the property is inaccessible. Portions of Inchbrakie Farm to the west of the dam configuration on this property would become inaccessible. The current access road of Riverholm will be inundated.
- **Access for farm labourers:** The body of water created by the proposed SGD will affect access of farm labourers and their families. Access from the southern side of the Mooi River to the northern side is currently feasible where it is possible to cross. In the future, such access would possibly require a trip to Nottingham Road, then to Rosetta, and finally a further distance on the Kamberg Road.

The above anticipated change processes commensurate with the proposed SGD and the resulting impacts differ markedly from unrelated processes that are currently in existence or expected to manifest over time. For example, town planning processes, industrial or tourism activities, or demographic/social change would not bring about comparable impacts on movement patterns/accessibility. Only severe floods are expected to impede daily movement patterns in a manner comparable to the proposed impoundment. These impacts, however, would be transient and infrequent, whereas those resulting from the proposed dam would be permanent. Given that the proposed SGD would by far outstrip any unrelated impacts (those occurring independent from the proposed project) on movement patterns and accessibility, would warrant the following rating:

Degree of certainty: Definite; **Significance:** HIGH; **Direction:** negative; **Time-scale:** long-term and **Spatial scale:** *local*.

(b) Mitigation Measures

In terms of the change process and impacts identified, and commensurate with the significance rating of “HIGH”, mitigation/alternatives is expected to be complex and/or expensive or not feasible (Kamberg Rd. option: according to DWAF).

■ **In the case of access roads to the Vaalekop South Smallholdings:**

Whilst the Kamberg Road has been mooted as a means of alternative access, it is “much longer and goes via Rosetta with a steep mountain descend (about 12%) at the end. It would require a very costly bridge over the Mooi River upstream of the fish barrier. A bridge over the fish barrier will be even more costly because it would be more than a 110m long. A bridge over the barrier weir could interfere with the barrier's sustained function. Another bridge, designed for a flood with a lower return period (1:50 or 1:100 years) will have to be constructed upstream of the basin of the fish barrier. This would increase the risk of road users being stranded by floods of a higher return period”.²⁷ The above notwithstanding, the owner of Inchbrakie Farm has articulated a number of alternatives. These alternatives (in order of preference) should receive careful consideration by qualified engineers (refer to Section 17.2 of the

²⁷ G. Geringer, DWAF, 22 December 2006.

EIR for recommendation in terms of a traffic engineering perspective (i.e bearing in mind distance and cost):

- Access road from Loteni Road along Riverholm 3 boundary fence;
 - A road over farm Inchbrakie – a reluctant option only – given potential 2nd order intrusion impacts on farm workers (proximity to accommodation units); the proximity to a dairy; the dairy being cut-off from the pasture (expanding herd of cows); length (compared to other options); and a bridge. (Should this option be pursued, following a thorough assessment in consultation with the property owner, the farm worker accommodation (graves also to be considered) and the dairy may have to be moved. The relevant mitigation measures set out under the section: “relocation related change processes and impacts” should then be applied.
 - Access to the Vaalekop smallholdings from property Dalcrue (without crossing the Mooi River);
 - Access to the Vaalekop smallholdings from the Kamberg road, (see above);
- **In the case of access roads to the property Riverholm traversing the properties Riverholm 15967 and Inchbrakie 14870:** The current access road of Riverholm will be inundated and a considerable part will have to be relocated (sections of the current road over the Inchbrakie Farm will also be inundated) (see the above alternatives).
 - **In the case of access for farm workers:** This impact cannot be reduced (a bridge over the impoundment would not be feasible), other than by providing suitable alternative access options (new permanent road) or transport facilities (a form of ‘off-site’ mitigation) or a ferry service, proposed by WRP Consulting Engineers (October, 2002).

(c) Post mitigation impacts

Since the mitigation measures are complex and/or expensive and not fully responsive to all movement related impacts described above, the post-mitigation rating is as follows:

Degree of certainty: Probable; **Significance:** MODERATE; **Direction:** negative; **Time-scale:** long-term; and **Spatial scale:** *local*.

iii. Decommissioning Phase

Decommissioning of the proposed SGD is expected to impact daily movement patterns in a manner similar to those anticipated during construction process. This variable has therefore been adjusted as follows:

Degree of certainty: Probable; **Significance:** MODERATE (LOW: Post-mitigation); **Direction:** negative; **Time-scale:** short-term and **Spatial scale:** *local*.

The same mitigation measures proposed under 'construction' should be applied.

4.2.2 Perceptions about public health, safety and security**i. Construction Phase****(a) Nature and extent of change processes and impacts**

A central change processes associated with the construction and decommissioning process of the SGD is the presence of contracting firms and construction workers (as well as construction equipment and vehicles), usually accommodated in construction camps. This may include 'legitimate' workers (who could also operate as 'insiders') as well as opportunists and burglars/robbers posing as construction workers. In the words of the SAPS Station Commander: Nottingham Rd.: "My concern is the increase in possible crimes as there will be opportunity. The bigger the project, the more opportunity, the more people involved, increased amounts of cash for payroll and so on, could result in a crime increase". Construction camps may be frequented by local sex workers, a change process with a bearing on health impacts. As a CPF representative noted: "the Construction firms need to keep a tight rein on their workers with proper ID and accommodation. There is a high probability that with wages coming in there will be dagga, shebeens, Shimewane (a dangerous home brew) and prostitution as well. Opportunistic theft could increase in the area as well".

From a perspective of impact focal points, this change process would manifest at the proposed dam wall site (proposed location of the construction site office/camp; material and equipment storage) and pump-station. Construction workers would have to access private properties, e.g. Springvale 2170/233, Rosetta 2983/07 and Coldstream (location of the proposed fish barrier) and traverse private properties, e.g. Inchbrakie and Riverholm. The main impacts associated with this change process include:

- **Safety and security impacts, including, but not limited to:**
 - burglary and/or armed robbery at private and commercial locations, including the construction sites (e.g. theft of heavy construction equipment and materials; robbery of employee wages); farms (e.g. theft of life-stock; agricultural produce; and farming equipment);
 - vandalism at construction sites;
 - accidents involving construction vehicles, impacting pedestrians and motorists;
 - accidents on construction sites such as persons falling into open trenches;
 - the practices of construction workers (cooking/heating; stray matches and cigarettes) thus creating a potential for stray fires.

- **Public health impacts:**
 - The presence of contractors and construction camps is associated with a number of social and environmental problems, particularly in the case of inadequate construction camp management practices. Such problems can include the erection of informal dwellings and allied problems such as lack of water, sanitation and waste disposal infrastructure, with resultant environmental pollution and health impacts. During the rainy season, surface water run-off can result in faeces being washed into streams, posing health risks elsewhere. These problems can be exacerbated in the event of an in-migration of job-seekers from elsewhere, who may

set-up informal dwellings in the vicinity of the construction camps.

- An increase in sexually transmitted infections (STIs) and HIV/AIDS is considered a tangible risk associated with construction camps, also bearing mind that KwaZulu-Natal has one of the highest levels of HIV/AIDS infection in the world²⁸. This impact has two dimensions in that contractors can infect sex workers and *vice versa*. At a secondary impact level, workers whose health is failing due to being infected, will be less productive and unable to carry out physically demanding (e.g. construction related) jobs. Employers may increase the size of the workforce to compensate for absent workers and hence payroll costs will rise²⁹.

(b) Cumulative Impacts

The planned new developments (applications received), some of which appear to be emerging on the back of the proposed Spring Grove Dam, are considered to be relevant as “present and foreseeable future actions”. Many are high income residential and tourism developments situated in the uMngeni Municipal area. The above and other developments are considered change processes that can manifest as cumulative impacts when added to the SGD. They are anticipated to intensify public health, safety and security related impact, should construction of these developments and the SGD occur concurrently. For example, trucks make use of the R103 to avoid toll fees. According to an I&AP there have been 5 fatalities here, including a policeman. The trucks drive over the white line when going around the sharp bends and cause accidents. There is a footpath which children use to go to and from school. Should the road be used by construction vehicles, cumulative impacts in terms of public health and safety would result.

²⁸ Health Economics and HIV/AIDS Research Division, University of Kwa-Zulu/Natal.

²⁹ Ibid.

Bearing in mind cumulative impacts; the magnitude of the project, as well as the unemployment and crime rates, this variable has been rated as follows:

Degree of certainty: Probable; **Significance:** HIGH; **Direction:** negative;
Time-scale: sporadic/intermittent; and **Spatial scale:** *local*.

(c) Mitigation Measures

The following mitigation³⁰ measures are proposed:

▪ Safety and Security Impacts

- › Contractors appointed by DWAF should screen prospective employees and subcontractors, including criminal background checks. Contractors should clarify, emphasize, and enforce rules that prohibit the taking of construction tools, materials, and private property.
- › Marking property with identification helps control burglary in three ways: (1) it warns burglars that owners are monitoring their property; (2) it discourages potential buyers of stolen property; and (3) it increases the probability that recovered property will be returned to its rightful owner.
- › Properly constructed and secured fences can control access to construction sites. Temporary wire fencing may be the most appropriate and cost effective for larger construction sites.
- › Workers should be urged to recognize and report suspicious activity and signs of burglary and be informed of crime prevention measures that they themselves can take. This would include closing farm and residential gates; and refraining from cutting locks on gates not authorized for access to construction sites.
- › All construction workers should wear clothing marked (and reflective vests) with the logo of the construction firm/contractor or sub-contractor as well as identification cards that cannot be easily forged, so that they can be easily recognised as being legitimate.
- › Sound design and servitude management practices should be applied to minimise impacts. A fire/emergency management plan is to be developed proactively in consultation with local Municipalities. Access roads could

³⁰ Adapted from Boba & Santos, 2006.

serve as firebreaks and potential “high fire risk” vegetation types should be removed.

- › Contractors should be urged to sustain a consistent workforce that is familiar with their rules, practices, and attitudes toward misappropriation of property. Contractors who use subcontractors who in turn hire other workers are likely to be at a higher risk of being burglarized.
- › Farm and home-owners should secure their properties bearing in mind that in planning their crimes, burglars and robbers consider accessibility cues (for example, how well the site is protected by doors, fences, or locks).
- › Prominently and strategically displayed signage can inform potential burglars that builders, residents/commercial businesses and police are working jointly to reduce crimes.
- › Drivers of construction vehicles should be licensed and experienced in handling their machinery and cautioned to obey the rules of the road.
- › Construction vehicle movement should be limited to off-peak periods on all major roads.
- › All roads used for construction purposes should be maintained, e.g. kept free of pot-holes; sprayed with water regularly to suppress dust, which could impede the visibility of motorists and truck drivers. The R103 seems to be under specific pressure, as it serves as a detour for trucks attempting to avoid paying toll on the N3.
- › Wages should be directly transferred into the accounts of workers rather than transporting cash to the construction site offices, so as to limit the potential for cash-in-transit heists and robberies.

- **Health Impacts**

- The contractor should ensure that workers are educated on HIV/AIDS and that condoms are distributed within the construction camps. The contractor should be encouraged to liaise with the local health services to ensure that their education/condom distribution programmes extend to the construction camps.

- › Construction camp locations (e.g. closer versus distant) would have a potentially mitigating effect or at least modulate the intensity of the HIV/AIDS and STI impact.
- › Construction camps should be equipped with waste disposal; bathroom and cooking facilities.

(d) Post mitigation impacts

The health, safety and security related impacts are expected to respond favorably to mitigation, at least insofar they relate to the SGD. Following successful mitigation, the rating can be adjusted as follows:

Degree of certainty: Probable; **Significance:** MODERATE; **Direction:** negative; **Time-scale:** sporadic/intermittent; and **Spatial scale:** *local*.

Note: Mitigation of impacts related to the SGD is the primary responsibility of the project proponent/contractor. Therefore, such measures are not expected to attenuate cumulative impacts (see above) associated with other projects.

ii. Operational Phase

(a) Maintenance related

In terms of the operational phase of the SGD, the rating for the variable, '*perceptions of public health, safety and security*', has been adjusted as follows.

Degree of certainty: Possible; **Significance:** VERY LOW; **Direction:** negative; **Time-scale:** intermittent/sporadic and **Spatial scale:** *local*.

The main motivation for this rating is that maintenance to be undertaken will be sporadic/intermittent, but would require private properties being accessed along the servitudes. Moreover, given the difference in scope between maintenance related activity and construction, the impacts are not anticipated to be significant. However, mitigation measures proposed under 'construction phase' should be applied as a proactive measure.

(b) Flood impacts

- **Nature and extent of change process and impact**

In terms of the operational phase, another change process is that of flooding - the impact pertaining to health and safety. It is long standing policy³¹ to add a buffer strip to the calculated high flood level (1:100 year). The following two norms are used to set out the buffer line:

- Highly developed areas such as vineyards, orchards, farm buildings, dams and towns: The Department (DWAF) has revised the norms since the initial draft of the report cited was written. The buffer line is now calculated as the greater of 1,5m vertically above the High Flood Level (HFL) or 15m horizontally.
- Lesser developed areas such as grazing: The buffer line is to be located 1,5 m vertically above the high flood line (1:100 year) or 45 m horizontally, whichever criterion leads to the largest horizontal distance.

The buffer strip noted above serves to compensate for any uncertainties regarding the estimated 1:100 year high flood line, thus ensuring that “people and property are not severely effected, if at all, during more severe flooding conditions” (ibid). Based on this information it would appear that flood related impacts, whilst possible, would be of a low significance in respect to people living in the impoundment area.

Degree of certainty: Possible; **Significance:** LOW; **Direction:** negative; **Time-scale:** long-term; and **Spatial scale:** *local*.

Whilst the information provided by DWAF justifies the above rating, it would be prudent to consider Tate’s (1996) observation that, (the) “return period of hydrological events is often misinterpreted as statistical. This is particularly true on dammed stream or streams whose watershed characteristics have been modified by land use. A prime example being urbanization which tends to increase flood frequency and severity due to increased storm flow from roofs, streets, etc, as well as reduced based flows due to reduced groundwater recharge” (p.2). Given the potential for land-use changes (see section on “community resources: infrastructure

³¹ goba moahloli keeve steyn, January 2004, p.59.

impacts”) of those properties partially affected by inundation, the impact thereof on flood returns should be monitored by DWAFT over the course of the operational life of the SGD.

In view of the above and in pursuit of erring on the side of safety, it would be sensible to generate an SGD Emergency Preparedness and Evacuation Plan (SGD-EPEP) which should be drafted with input from all role-players (also local and provincial emergency management agencies) and in consultation with riparian land owners/residential and farmers’ associations). The necessary communication infrastructure, including early warning systems; radio infrastructure (citizen band; cell-phone) and an evacuation plan, should be put in place. This plan should be rehearsed regularly with the participation of all roll-players.

- **Post Mitigation**

Based on the above checks and balances, the following adjusted rating (impact) would seem reasonable:

Degree of certainty: Probable; **Significance:** VERY LOW; **Direction:** negative; **Time-scale:** long-term; and **Spatial scale:** *local*.

iii. **Decommissioning Phase**

Given an expected reasonable level of worker activity to decommission the SGD (should this be required in the future), this variable relating to public health, safety and security has been rated as follows.

Degree of certainty: Probable; **Significance:** MODERATE (LOW: Post Mitigation); **Direction:** negative; **Time-scale:** sporadic/intermittent and **Spatial scale:** *local*.

The impacts will be responsive to mitigation measures proposed under ‘construction phase’ above.

4.2.3 Impacts on tourism and recreational activities

i. Construction Phase

- **Nature and extent of change processes and impacts**

Change processes associated with the presence of construction workers and construction activities can create impacts:

- by altering the manner in which individuals *perceive* their recreational activities, including loss of privacy; the quality of the recreational process; interaction with others; and/or
- through felt, physical impacts, by impeding access to recreational facilities or impacting the recreational facilities themselves (thus preventing/limiting recreational activity); creating noise and dust as well as other intrusive impacts (which are also assessed under separate headings).

The low population density (in the immediate vicinity of the proposed dam wall (focal points include: Springvale 2170/233 and Rosetta 2983/07), pump-station and river flow measuring weirs, would justify the following rating:

Degree of certainty: Probable; **Significance:** LOW; **Direction:** negative; **Time-scale:** short-term; and **Spatial scale:** *local*.

(b) Mitigation Measures

The following mitigation measures are proposed:

- Expedite the process of constructing the pump-station;
- Limit construction activities to working hours (preferably no work on Sundays);
- Urge workers not to intrude into properties, including peering over walls; requesting water from domestic water supplies or using the toilet facilities on private / commercial properties.
- Limit intrusion impacts (visual; dust; noise), which could adversely affect the quality of residents' recreational activities. This should include strict adherence to, and enforcement of, speed limits and spraying of dirt roads and construction sites to suppress dust.

(c) Post mitigation impacts

The impacts on recreational facilities and activities fall well within the bounds of the mitigation measures proposed. Following successful mitigation, the rating can be adjusted as follows:

Degree of certainty: Probable; **Significance:** VERY LOW; **Direction:** negative; **Time-scale:** short-term; and **Spatial scale:** *local*.

ii. Operational Phase

(a) Positive Impacts

The proposed SGD is expected to have a positive impact on tourism and recreational activities in the immediate vicinity as well as the Midlands Meander as a whole. The water surface is set to be made available for recreational purposes³², including fishing and water sports. It is the expressed wish of I&APs (e.g. Sub 5 of Vaalekop 3297) for the proposed SGD not to be fenced off to prevent dam-front access for these purposes.

Those property owners, who no longer wish to pursue farming, either due to partial inundation of their properties (Vaalekop Smallholdings) or by choice, could sub-divide their properties and launch riparian tourism ventures or sell off their properties.

These positive impacts notwithstanding, making the water surface available for recreational purposes should be approached with caution given the potential for 2nd order *negative* impacts. This could include intrusion impacts, e.g. noise from powerboats and wet-bikes; camping/motor vehicles (noise; light intrusion), which could, over time, irrevocably alter the quiet rural character of the area (notably smallholdings; farms). It was proposed that the SGD be modeled on the Sterkfontein Dam rather than, for example, the Hartbeespoort Dam. Furthermore, an I&AP noted that: "Trout fishing businesses control the river mainly. The proposed dam may change that. If the water is not controlled, other fish species may be introduced in an unregulated way leading to the destruction of the trout fishing industry".

³² J. Geringer (DWAf, 16 April 2007: Response to question at Public Meeting.

In rating the positive impacts, the proposed SGD and its impact on tourism and recreational activities must be placed within the context of the current characteristics of the area which is already strongly tourism orientated and features the Midmar Dam. Whilst formidable, it can therefore not be considered novel, but is expected to play an important role in making the Midlands an even more desirable tourist destination or a permanent residential option for those wishing to 'scale down' and settle permanently.

The positive impact has been rated as follows:

Degree of certainty: Definite; **Significance:** MODERATE; **Direction:** positive; **Time-scale:** long-term and **Spatial scale:** *regional*.

(b) Negative Impacts: Maintenance

In terms of the operational phase of the SGD, the rating for the variable, '*tourism and recreational activities*', has been adjusted as follows.

Degree of certainty: Possible; **Significance:** VERY LOW; **Direction:** negative; **Time-scale:** intermittent/sporadic and **Spatial scale:** *local*.

The main motivation for this rating is that maintenance to be undertaken will be sporadic / intermittent, but would require private properties being accessed (pump-station; river flow gauging weirs). Impacts on tourism and recreational activities are therefore possible but not of great significance.

(c) Negative Impacts: Fishing in the upper Mooi River

• **Nature and extent of change processes and impacts**

The Inchbrakie Falls currently acts as a natural barrier to migration of the Smallmouth Bass into the upper reaches of the Mooi River. Smallmouth Bass, an introduced fish species, have not been found in the catchment upstream of Inchbrakie Falls but will definitely certainly colonise the river when the proposed dam inundate the Falls. This change process and resulting displacement of the Brown Trout by the Smallmouth Bass would impact the commercial (61%) fishing industry in the upper Mooi River (see section on 'socio-economic impacts'). The potential loss to the economy of the

Nottingham Road, Rosetta/Kamberg and Midlands Meander area would therefore be significant.

Consequently, the following rating obtains:

Degree of certainty: Definite; **Significance:** HIGH; **Direction:** negative; **Time-scale:** long-term and **Spatial scale:** *regional*.

• **Mitigation**

The impact on the recreational trout fishing industry is expected to be fully responsive to mitigation, the core of which is a fish barrier proposed upward of the Inchbrakie Falls, on the property Coldstream³³. “The construction of a properly designed weir would effectively prevent the invasion of bass into the Upper Mooi River. The weir itself is not expected to have any major environmental impact. Affected infrastructure includes a number of pump houses which can be moved, and may also include a section of gravel road. Landowners have generally opted for the establishment of a servitude rather than expropriation of land” (ibid, p.iv).

• **Post mitigation impacts**

Following successful mitigation by means of a fish barrier, the rating can be adjusted as follows:

Degree of certainty: Unlikely; **Significance:** NO IMPACT; **Direction:** negative; **Time-scale:** N/A; and **Spatial scale:** N/A.

iii. **Decommissioning Phase**

• **(De)-construction Impacts**

A reasonable level of worker activity is expected to be necessary to decommission the SGD (should this be required in the future). The activity (change process), however, is not expected to be on-par with that of the construction phase.

Consequently, the variable relating to *‘tourism and recreational impacts’*, has been rated as follows.

Degree of certainty: Possible; **Significance:** LOW (VERY LOW: Post

³³ IWR Source-to-Sea, January 2005.

Mitigation); **Direction:** negative; **Time-scale:** sporadic/intermittent and **Spatial scale:** *local*.

The same mitigation measures discussed under “construction” should be applied. This should decrease the significance to LOW (see brackets above).

- **Tourism**

The void left by the SGD if/when decommissioned is expected to impact tourism very adversely as it would impact recreational (including fishing) and tourism ventures which require the body of water/surface and base its marketing on it. It would also impact those property owners who would have sub-divided and sold parts of their properties to those wanting to settle in the area permanent.

Degree of certainty: Definite; **Significance:** VERY HIGH; **Direction:** negative; **Time-scale:** permanent and **Spatial scale:** *regional*.

The impact will not respond to mitigation.

4.2.4 Disruption of Social Networks

- i. **Construction Phase**

- (a) **Nature and extent of change processes and impacts**

Interference by construction workers/job seekers from elsewhere in local social networks can be considered a change process associated with the proposed SGD construction process. Impacts will result if:

- › locals perceive this interference as adversely affecting the manner which they go about servicing their social networks, including how they relate to each other socially or in pursuit of religious and cultural practices / seek to fulfill their instrumental and/or emotional social support³⁴ related needs; and
- › such interference and perceived impacts result in frustration or anger as well as potential conflict with newcomers.

Impact focal points could include local settlements as smaller communities or homesteads accessible to the inhabitants of construction camps.

³⁴ Instrumental support includes advice and assistance (including material assistance); social support is defined as moral support; sympathy and understanding.

If present, the above impacts would adversely affect the creation of social capital (a crucial ingredient in producing safe, happy, and productive communities), bearing in mind that social capital derives from a person's membership of groups and institutions and social networks, including religious participation with others.

The above interference and resulting impacts manifesting would depend on a number of factors, including whether newcomers:

- › are foreigners or S.A. nationals from elsewhere (other areas in the KZN province; other provinces). As noted previously, research shows that foreigners exist as discrete networks and don't readily assimilate into local communities. If this research is correct, interference and impacts on social networks would therefore be more readily attributable to foreigners than S.A. nationals (newcomers) from elsewhere.
- › will be able to secure employment or are already employed by the SGD contractor(s), thus being able to meet their primary needs, e.g. shelter and food, thus not needing to interfere in existing social networks with the objective to secure instrumental support;
- › will be in the area only to secure employment at the proposed SGD project (in the case of job-seekers) and leave if they are unsuccessful in doing so. (Construction workers who are part of a stable, permanent contractor workforce are expected to vacate the area following completion of the SGD construction process).

Bearing in mind the above uncertainties, but given the importance of social capital for community safety and stability and the role of social networks in this regard, this variable has been rated as follows:

Degree of certainty: Possible; **Significance:** HIGH; **Direction:** negative; **Time-scale:** sporadic/intermittent; and **Spatial scale:** *local*.

(b) Mitigation Measures

In the case of the variable 'disruption of social networks', mitigation is anticipated to be difficult, but probably more achievable in terms of a stable workforce already employed by, or yet to be employed by the DWAF appointed contractor(s). The contractor would be able to put in place certain rules and regulations with the

objective to prevent interference in local social networks. However, mitigation would fall outside the purview of the contractor(s) in the case of disruption of social networks by newcomers in search of employment at the SGD.

(c) Post mitigation impacts

Bearing in mind that mitigation measures would apply only to the workforce:

Degree of certainty: Possible; **Significance:** MODERATE; **Direction:** negative; **Time-scale:** sporadic/intermittent; and **Spatial scale:** *local*.

ii. Operational Phase

(a) Nature and extent of change processes and impacts

In terms of the operational phase of the SGD, the change process would revolve around barriers to pedestrian movement (see section on movement patterns) as well as potentially greater trip lengths via alternative access routes, notably to and from the Vaalekop Smallholdings. Impacts on social networks would result if these impediments to movement and the potential inconvenience of greater distances (also between residents relocated to alternative accommodation): (1) reduce opportunities for process contact among those forming part of the existing networks; (2) discourages people from accessing their networks. Bearing in mind that social networks don't necessarily only hinge on physical interaction but that alternative means of making bonding (e.g. telephones, cell phones; e-mail) can also be used, the variable, '*impacts on social networks*', has been rated as follows.

Degree of certainty: Probable; **Significance:** MODERATE; **Direction:** negative; **Time-scale:** long-term and **Spatial scale:** *local*.

(b) Mitigation Measures

- A pedestrian bridge may not be feasible due to the size of the impoundment. However, a ferry service as proposed by WRP Consulting Engineers (October, 2002) may be a creative solution, given that access to the impoundment/water surface is expected to be allowed. This would have to be investigated further.
- In terms of alternative routes (something DWAF's engineers are set to investigate further) to areas such as the Vaalekop Smallholdings, given

inundation of parts of the existing road, it would be important to limit trip/road distances. This should help sustain social networks, also through convenient access to places of congregation.

Subject to successful mitigation, also meeting the needs of the poor, the variable, *'impacts on social networks'* can be adjusted as follows:

Degree of certainty: Possible; **Significance:** LOW; **Direction:** negative; **Time-scale:** long-term and **Spatial scale:** *local*.

iii. Decommissioning Phase

A reasonable level of worker activity is expected to be necessary to decommission the SGD (should this be required in the future). The activity (change process), however, is not expected to be on-par with that of the construction phase. Consequently, the variable relating to *'impacts on social networks'*, has been rated as follows.

Degree of certainty: Possible; **Significance:** LOW (VERY LOW: Post Mitigation); **Direction:** negative; **Time-scale:** sporadic/intermittent and **Spatial scale:** *local*.

The same mitigation measures discussed under "construction" should be applied. This should decrease the significance to LOW (see brackets above).

Table 4: Summary Table of Individual and Family level Impacts: Construction Phase

Impact Variable	Certainty		Significance		Direction (+;-)		Time Scale		Spatial Scale	
	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.
Impacts on daily movement patterns	Definite	Probable	HIGH.	MOD.	-	-	Spo-radic	Spo-radic	Loc.	Loc.
Public health, safety & security impacts	Probable	Probable	HIGH	MOD.	-	-	Spo-radic	Spo-radic	Loc.	Loc.
Impacts on tourism and recreational activities	Probable	Probable	MOD.	LOW.	-	-	S.T.	S.T.	Loc.	Loc.
Disruption of Social Networks	Possible	Possible	HIGH	MOD.	-	-	Spo-radic	Spo-radic	Loc.	Loc.

Table 5: Summary Table of Individual and Family level Impacts: Operational Phase

Impact Variable	Certainty		Significance		Direction (+;-)		Time Scale		Spatial Scale	
	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.
Impacts on daily movement patterns	Definite	Probable	HIGH	MOD.	-	-	Long-term	Perm.	Loc.	Loc.
Public health, safety & security impacts	Possible	N/A	VERY LOW	N/A	-	-	Sporadic	Spor.	Loc.	Loc.
Public health, safety & security impacts: flood impacts	Possible	Possible	LOW	VERY LOW	-	-	Long-term	Long-term	Loc.	Loc.
Impacts on tourism and recreational activities	Definite ³⁵	N/A	MOD.	N/A	+	N/A	Long-term	N/A	Reg.	N/A
	Possible ³⁶	Possible	VERY LOW	N/A	-	-	-	N/A	Loc.	Loc.
	Definite ³⁷	Unlikely	HIGH	Nil	-	N/A	Long-term	N/A	Reg.	N/A
Disruption of Social Networks	Possible	Possible	MOD.	LOW	-	-	Long-term	Long-term	Loc.	Loc.

³⁵ Tourism (positive);

³⁶ Maintenance (negative);

³⁷ Recreational fishing/brown trout upstream of the Inchbrakie Falls (negative) ;

Table 6: Summary Table of Individual and Family level Impacts: Decommissioning Phase

Impact Variable	Certainty		Significance		Direction (+;-)		Time Scale		Spatial Scale	
	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.
Impacts on daily movement patterns	Probable	Probable	MOD.	LOW	-	-	S.T.	S.T.	Loc.	Loc.
Public health, safety & security impacts	Probable	Probable	MOD.	LOW	-	-	Sporadic	Sporad.	Loc.	Loc.
Impacts on tourism and recreational activities	Probable ³⁸	Probable	LOW	VERY LOW	-	-	S.T	S.T.	Loc.	Loc.
	Definite ³⁹	VERY HIGH	VERY HIGH		-	-	Perm.	Perm.	Reg.	Reg.
Disruption of Social Networks	Possible	Possible	LOW	VERY LOW	-	-	Sporadic	Sporad.	Loc.	Loc.

³⁸ Construction impacts (negative);

³⁹ Tourism impacts (negative);

4.3 COMMUNITY RESOURCES: INFRASTRUCTURE AND LAND USE CHANGES; LAND CLAIMS

Context:

- **This variable seeks to assess:** Any changes and associated impacts relating to: (1) community infrastructure (affected parties); (2) properties; and (3) land use changes, including zoning, sub-division of land and land-claims, commensurate with the proposed SGD.
- **Thumbnail sketch of baseline conditions: Property value:** The value of property in the KZN Midlands has rocketed and the trend continues almost unabated, whether permanent residences or weekend getaways.” Reasons stated include: living the “dream” of country, proximity to Gauteng and the sea, prime schooling, the Midlands Meander, possibility to manage a business from there due to the technological advancements, commuting to Durban and Johannesburg on a daily basis is possible (when necessary) (Property Magazine, 2005).

4.3.1 Changes in Community Infrastructure⁴⁰

i. Construction and Operational Phase

(a) Nature and extent of change processes and impacts

The focus of this section is on the operational phase given that properties which are directly affected by construction of the dam wall, in terms of infrastructure impacts, e.g. Springvale 2170/234 and Springvale 2170/226 will probably be totally inundated/fully expropriated (latter) or partially inundated and fully expropriated (former).

The impacts on community/farm infrastructure were determined and quantified in an extremely finely grained manner during the 2002 SIA. Whilst it appears that certain additions were made in terms of infrastructure on farms and small holdings (e.g. centre-pivots: irrigation), the significance of infrastructure impacts described in 2002 is already considered highly significant (see further discussion and rating below). Renewed surveying and quantification of infrastructure affected by the proposed SGD, falls outside the scope of this assessment. The reader of this report is

⁴⁰ Adapted from WRP Consulting Engineers (October, 2002).

encouraged to refer to the SIA, forming part of an Environmental Impact Report conducted in 2002 (WRP Consulting Engineers). In summary, and for ease of reference, the categories and numbers of infrastructure expected to be impacted by the proposed SGD (to be verified during the expropriation/compensation phase) are summarized in the tables below:

Table 7: Numbers of potentially impacted infrastructure⁴¹

CATEGORY	TYPE	SCENARIO B (1433.5 m.a.s.l) NUMBER
Buildings	Farm House	10
	Cottage	5
	Workshop	4
	Labour accommodation	31
	Animal housing	5
	Storage	10
	Milking	2
	Greenhouse	1
	Other	8
	Unknown	6
	Not specified	2
	Office/Administrative	-
	Pumps & pump houses	Diesel
Electrical		10
Hand operated		1
Hydraulic		1
Unknown		1
Petrol		-
	Circular reservoir	1
Farm Dams	Earth embankment	14
	Unknown	8
	Concrete	1
Reservoirs	Plastic Tank	2
	Steel	7
	Unknown	-
	Domestic	12
	Irrigation	2
Boreholes	Other	1
	Stock watering	1
	Unspecified	9
	Pump House	-

⁴¹ Adapted from WRP Consulting Engineers (October, 2002), p.3-4.

Bridges	Vehicular	6
	Storm water	2
Culverts	Vehicular	10
Quarry (Wellington: 80%; Springvale: 20%).	-	1

Table 8: Numbers of potentially impacted infrastructure⁴²

CATEGORY	TYPE	SCENARIO B (1433.5 m.a.s.l) LENGTH (km)
Pipelines	Water supply	8.35
	Water supply: livestock	0.63
	Sewerage	0.03
	Septic tanks	-
	Stormwater	-
	Other pipelines	-
Telephone lines	Trunk line	0.80
	Local	0.55
	Individual	1.10
Roads	Farm road	15.16
	Local road (tar)	0.08
	Local road (gravel)	1.38
Power lines	11 kVA	8.56
	Private	0.50
Irrigation pipelines	Pipe system	2.66
	Sprinklers	11.70
	Drip system	0.25
	Other irrigation pipelines	4.10
	Portable laterals	-
	Barbed wire	66.78
Fencing	Pole	2.40
	Bonox	4.76
	Other	3.73

The impacts (property dependent; partial vs. full inundation) on infrastructure would extend to daily living (e.g. accommodation; communication; water; electricity; sanitation and access) as well as farming activity.

⁴² Ibid. p.3-4 ff.

In view of the above, the impacts on infrastructure and allied impacts, whilst diverse across the affected properties, have been rated as follows:

Degree of certainty: Probable; **Significance:** HIGH; **Direction:** negative;
Time-scale: permanent; and **Spatial scale:** *local*.

(b) Mitigation Measures

- Given that the exact categories and numbers of expected impacted infrastructure may have changed since the 2002 SIA, it is important for the necessary checks and balances to be attained during the compensation and expropriation process.
- Whilst the chief focus has to date been the properties affected by inundation, the properties to be affected by the proposed quarry (Wellington and Springvale Farm) must receive the necessary attention.
- Appointment of an independent assessor by the affected property owners to carefully survey, quantify and calculate infrastructure related losses, would be prudent to create a firm basis for engagement with the DWAF assessors. This is particularly the case since I&APs perceive the estimated amount for compensation for infrastructure and land set-out in the SIA of 2002 to be inadequate.
- Financial compensation for loss of infrastructure is expected to be a mitigation measure responsive to the physical impacts described above, justifying an adjusted rating (below). For example, with compensation provided, property owners can acquire new infrastructure and/or land on their current properties, or in the case of total inundation and expropriation, elsewhere. In order to prevent interruptions of farming activity or impacts on daily living (accommodation; water, electricity and sanitation; and access), infrastructure losses should be compensated for prior to the filling⁴³ of the impoundment in order to enable affected parties to acquire new infrastructure or relocate existing infrastructure.

(d) Post mitigation impacts

The rating is adjusted as follows:

Degree of certainty: Probable; **Significance:** MODERATE; **Direction:** negative; **Time-scale:** permanent; and **Spatial scale:** *local*.

ii. Decommissioning Phase

The decommissioning process is not expected to impact community infrastructure:

Degree of certainty: Unlikely; **Significance:** NO IMPACT; **Direction:** N/A; **Time-scale:** N/A and **Spatial scale:** *N/A*.

4.3.2 Inundation and resultant land-use changes⁴⁴**i. Construction and Operational Phase****(a) Nature and extent of change processes and impacts**

The focus of this section is on the operational phase given that properties which are directly affected by construction of the dam wall, in terms of land-use, e.g. Springvale 2170/234 and Springvale 2170/226 will be totally inundated/fully expropriated (latter) or partially inundated and fully expropriated (former).

The inundation impacts were determined and quantified, on a property specific basis during the 2002 SIA. Renewed surveying and quantification of all inundation related impacts commensurate with the proposed dam falls outside the scope of this assessment. Whilst the inundation of properties can be considered the change process, the land-use impacts are as follows:

- total loss of productive land use due to extensive inundation and consequent complete expropriation of the property (refer to section on relocation impacts for a list of properties probably facing full expropriation);
- partially or minimally affected and expropriated farms becoming non-

⁴³ Although not part of the ambit of a SIA, one I&AP noted that if islands are formed, wildlife could be caught or trapped by rising water. In the case of Kariba Dam, water came up so fast that animals were trapped and snakes took to trees. Farmers at the time mounted a massive rescue operation using boats to rescue snakes, wildlife including wild pigs, and buck

⁴⁴ Adapted from WRP Consulting Engineers (October, 2002), p.3-2.

viable in terms of current land uses, and with the owners:

- opting for changes in land use. (Research conducted has shown that sub-division of some of the affected properties for purposes of land-use changes, is already taking place. However, sub-division is generally not the direct result of the perceived prospects commensurate with the SGD. It can more readily be attributed to tourism growth and increases in property prices in the area over the past decade. It would therefore be reasonable to regard sub-divisions, where they are *not* the result of expected inundation related pressures⁴⁵ to change land-uses, as 2nd order impacts (responses of the community rather than the dam's impacts specifically). In the words of a Local Govt. official: "...sub-divisions...have taken place since 2002. Applications are received on a regular basis and this trend is expected to continue." (See also the section on health and safety impacts); or
- selling-off the non-affected portions.

Those properties partially affected by inundation and expected and whose owners are to be compensated for losses are summarized below (excludes those inundated <1% and those earmarked for full expropriation despite minimum inundation, e.g. Sub 234 of Springvale 2170):

Table 9: Properties partially/minimally affected by inundation/other⁴⁶

PROPERTY	AFFECTED AREA (%)	COMMENT
Sub 112 (of 87) of Springvale 2170	6.8%	Continuation of current activities or alternative land uses.
Remainder of Spring Grove 2169	22.0%	Probable continuation of current land-use if infrastructure to abstract water from the Mooi River can be relocated & abstraction sustained.

⁴⁵ These will, in any event, only become fully apparent during the final design stages.

⁴⁶ Adapted from WRP Consulting Engineers (October, 2002), p.3-4.

Remainder of Inchbrakie ⁴⁷ 14850	15.2%	Current land use could continue bearing in mind access problems & infrastructure impacts.
Sub 49 of Vaalekop 3297	11.3%	Current land use could be sustained or alternative land-uses pursued.
Sub 48 of Vaalekop 3297	6.5%	Current land use could be sustained or alternative land-uses pursued.
Sub 47 of Vaalekop 3297	4.9%	Current land use could be sustained or alternative land-uses pursued.
Sub 46 of Vaalekop 3297	6.9%	Current land use could be sustained or alternative land-uses pursued.
Re of Sub 2 (of 1) of Vaalekop 3297	1.4%	Current land use could be sustained or alternative land-uses pursued.
Sub 16 of Vaalekop 3297	9.1%	Current land use could be sustained or alternative land-uses pursued.
Sub 20 of Vaalekop 3297	21.6%	Current land use could be sustained or alternative land-uses pursued.
Sub 23 of Vaalekop 3297	24.5%	Current land use could be sustained or alternative land-uses pursued.
Sub 24 of Vaalekop 3297	24.2%	Current land use could be sustained or alternative land-uses pursued.
Sub 25 of Vaalekop 3297	36.1%	Current land use could be sustained or alternative land-uses pursued.
Sub 26 of Vaalekop 3297	45.7%	Current land use (recreational fishing) could be sustained or expanded.
Sub 27 of Vaalekop 3297	29.6%	Current land use could be sustained or alternative land-uses pursued.

⁴⁷ Bearing in mind that Inchbrakie farm feeds three dairy farms in the area with feed for the dairy cows which produce milk largely for Gauteng.

Sub 28 of Vaalekop 3297	49.9%	Current land use could be sustained or alternative land-uses pursued.
Sub 31 of Vaalekop 3297	60.2%	Current land use (trout fishing) could be sustained or expanded (access road will be inundated).
Sub 32 of Vaalekop 3297	37.5%	Currently undeveloped-development possible.
Sub 33 of Vaalekop 3297	26.0%	Currently largely undeveloped-development possible.
Sub 35, 39, 40 & 43 of Vaalekop 3297	69.3%	Extent of inundation may necessitate land use change, land being sold-off or full expropriation.
Sub 36 of Vaalekop 3297	3.7%	Current land use could be sustained or alternative land-uses pursued.
Remainder of Vaalekop 3297	66.1%	Extent of inundation may necessitate land use change, land being sold-off or full expropriation.
Sub 7 & 8 of Rosetta 2983	26.1%	Current land use could be sustained or alternative land-uses pursued.
Springvale 2170	20%	Undeveloped: other land uses following rehabilitation possible.

It is, with some exceptions, not clear whether the owners of properties minimally or partially affected will pursue other land uses. Moreover, compared to other impacts, minimum or partial inundation is seen to be moderate in significance from a land-use change perspective, given that mitigation is achievable. Moreover, some of the affected sections of properties (e.g. Vaalekop smallholdings facing the Inchbrakie Falls) exhibit topographical features, e.g. extremely steep gradients, which would have made productive land-use tricky, if not impossible. The following rating applies:

Degree of certainty: Probable; **Significance:** MODERATE; **Direction:** negative; **Time-scale:** permanent; and **Spatial scale:** *local*.

(b) Mitigation Measures

The following mitigation measures are proposed:

- Compensation by DWAF for land loss incurred (including productive land) based on the careful consideration of the specific situation of each property owner. For example, in the case where: (1) only small or inaccessible areas of land are expected to remain after inundation; or (2) land use changes are unfeasible, complex or expensive, expropriation in toto may offer relief. (It is unlikely that DWAF would fully expropriate only minimally inundated farms that become non-viable in terms of current land uses, as it is “not in the property business”⁴⁸).
- The owner initiating changes in land-use or selling-off of residual, non-affected portions to capitalize on the opportunities commensurate with the proposed SGD.
- Given that the inundation impacts may have changed since the 2002 SIA due to changes in land-use, it is important for the necessary checks and balances to be attained during the compensation and/or expropriation process. Appointment of an independent assessor by the affected property owners to carefully survey, quantify and calculate land losses, would be prudent to create a firm basis for engagement with the DWAF assessors. This is particularly the case since I&APs perceive the estimated compensation figures for infrastructure and land set-out in the SIA of 2002 to be inadequate
- Rehabilitation of land (in the case of the quarry site).

Financial compensation for loss of infrastructure is expected to be a mitigation measure responsive to the physical impacts described above, justifying an adjusted rating (below). For example, with compensation provided, property owners can re-zone their properties, or pursue other land-uses (where feasible).

Degree of certainty: Probable; **Significance:** LOW; **Direction:** negative; **Time-scale:** permanent; and **Spatial scale:** *local*.

⁴⁸ J. Geringer, 16 April 2007.

iii. Decommissioning Phase

Following decommissioning of the SGD and rehabilitation, land thus freed-up may be made available for other productive uses (if feasible):

Degree of certainty: Possible; **Significance:** MODERATE; **Direction:** positive; **Time-scale:** permanent; and **Spatial scale:** *local*.

4.3.3 Abstraction of water from the impoundment: Domestic and Agricultural Uses⁴⁹

i. Operational Phase

(a) Nature and extent of change processes and impacts

Many of the affected properties within the proposed SGD basin are dependent upon water abstracted from the river for domestic purposes. For certain of the affected properties, the Mooi River is the only water source. This situation is applicable to the smallholdings that are subdivided portions of the farms Spring Vale and Vaalekop. Whilst the proposed impoundment is the change process, the impact would be the absence of the current water source and concomitant impacts on domestic needs/requirements for daily living.

In terms of abstraction for agricultural uses, the change process would be inundation of infrastructure (pumps; pipelines) needed to abstract water or access to the water source (Mooi River) being disallowed. For example, in the case of the Remainder of Spring Grove 2169, water abstraction from the river will be impeded by the impoundment. The result impact would be the inability to secure water for livestock, crops and (vegetable) gardens on the remaining unaffected portions of properties. Consequently, this, and other properties may become unviable.

The following properties were identified as probably having a need to abstract water from the impoundment for farming purposes:

- Sub 0 of the farm Spring Grove 2169;
- Sub 8 of the farm Rosetta 2983;
- Sub 0 and Sub 14 of the farm Vaalekop 3297 (North bank);

⁴⁹ Adapted from WRP Consulting Engineers (October, 2002), p.5-9.

- Subs 46, 47, 48 and 49 of the farm Vaalekop 3297 (South bank);
- Sub 0 of the farm Inchbrakie 14850; and
- Subs 0, 2 and 3 of the farm Riverholm 15967;

For those expected to be cut-off from the current water source, the following rating applies:

Degree of certainty: Definite; **Significance:** HIGH; **Direction:** negative;
Time-scale: permanent; and **Spatial scale:** *local*.

Further to the above change processes and impacts, the situation as articulated by the Mooi River Irrigation Board (MRIB) (the “single biggest water user in the Mooi River catchment”⁵⁰) requires attention. According to the MRIB, they find the results of a DWAF study which calls for their cutting back on irrigation in the upper areas of the Mooi in favour of “development elsewhere...unacceptable”⁵¹. These concerns were echoed in a letter by the Mooi River Farmers Association which states that, “...we believe that other alternatives are available for supplying additional water to Greater Durban, other than pressing ahead with the Springgrove dam project”.

At the time of finalizing the SIA, the MRIB had called for “figures for yield for the different catchments and for Durban/Pietermaritzburg; the impact of raw water treatment and transportation costs; expropriation costs if not yet taken into account; desalination cost effectiveness; and the cumulative effect on the environment of this project and other developments” (p.8). Furthermore, a relevant DWAF report would be sent for review by a “hydrology professor from Stellenbosch” . If the report is found to be lacking, “it will be redone” (p.8).

In view of the above, and the definition of the significance rating set-out under the methodology section of this report, the consultant cannot make an assessment given currently available information. Significance is therefore rated as “DON'T” KNOW”.

⁵⁰ Letter from the Mooi River Farmers' Association , 20 June 2007, p.2.

⁵¹ Minutes of Focus Group Meeting held with MRIB, 25 June 2007, p.2.

(b) Mitigation Measures

- It is the stated DWAF policy to allow continued abstraction in the case of current lawful water users. This would include upstream (of the dam wall) and downstream properties. No further lawful entitlements will be issued after the proposed SGD has been built.⁵²
- If the abstraction of water from the future impoundment is impeded due to infrastructure impacts, alternative means would have to be provided in consultation with the affected property owners. For example, in the case of the Remainder of farm Spring Grove 2169 it might be an option to link-up (along the D146) with the rising main pipeline as it exits the site of the proposed pump-station.
- In the case of all lawful water users, alternative sources/means will have to be provided. The loss of a water supply is considered the loss of an asset and is provided for by the DWAF expropriation and compensation procedures. Compensation for the loss of the water supply can be utilized by the landowner to develop a new supply.
- Alternative supplies to others currently abstracting water from the Mooi River for domestic, food (vegetable gardens) or agricultural purposes should be investigated, notwithstanding the above considerations pertaining to current lawful users.

(c) Post Mitigation

Subject to successful implementation of mitigation measures, the rating can be adjusted as follows:

Degree of certainty: Unlikely; **Significance:** MODERATE; **Direction:** negative; **Time-scale:** permanent; and **Spatial scale:** *local*.

ii. Decommissioning Phase

Decommissioning of the SGD (if and when it happens) (change process) would have an adverse impacts on water abstraction, thus impacting domestic and farming uses.

This particularly the case if abstraction from the Mooi River is no longer an option.

⁵² J. Geringer, 16 April 2007.

Given that such impacts would not be responsive to mitigation (no other water sources/rivers present), the following rating would accrue:

Degree of certainty: Possible; **Significance:** VERY HIGH; **Direction:** positive; **Time-scale:** permanent; and **Spatial scale:** *local*.

4.3.4 Desirability and impact of MMTS-2

i. Operational Phase

A further water abstraction related concern relating to irrigation was raised by the Mooi River Irrigation Board (MRIB) (the “single biggest water user in the Mooi River catchment”⁵³). According to the MRIB, they find the results of a DWAF study which calls for their curting back on irrigation in the upper areas of the Mooi in favour of “development elsewhere...unacceptable”⁵⁴. These concerns were echoed in a letter by the Mooi River Farmers Association which states that, “...we believe that other alternatives are available for supplying additional water to Greater Durban, other than alternatives are available for supplying additional water to Greater Durban, other than pressing ahead with the Springrove dam project”. The MRIB had called for “figures for yield for the different catchments and for Durban/Pietermaritzburg; the impact of raw water treatment and transportation costs; expropriation costs if not yet taken into account; desalination cost effectiveness; and the cumulative effect on the environment of this project and other developments” (p.8). A study⁵⁵ conducted, inter alia, in response to these concerns found that:

“the desirability of commencing with MMTS-2 is highlighted by the fact that the BCRs⁵⁶ and IRRs⁵⁷ for both the financial and economic CBAs for MMTS-2 are nearly double those calculated for MWP-1 (Mkomazi River MWP-1) The net reference value of water (URV) for the Mooi Transfer Scheme is R1.20 per cubic metre against R4.20 per cubic metre” (p.iii).

The study also found that: “...the employment that will be created in the Mgeni supply area will be greater with a factor of 10 than the employment that will be lost

⁵³ Letter from the Mooi River Farmers' Association, 20 June 2007, p.2.

⁵⁴ Minutes of Focus Group Meeting held with MRIB, 25 June 2007, p.2.

⁵⁵ Conningarth Economists, October 2007 (Draft Report).

⁵⁶ Benefit Cost Ratio.

⁵⁷ Internal Rate of Return.

in the donor catchment” (p.iii), “Assurance of future water supply” (p.iii) for current irrigation farmers was found to be a positive impact in the study (p.iii).

It is on the basis of the results of the socio-economic study, also as it rates to the *desirability*⁵⁸ of the MMTS-2 and its benefits (also in terms of assurance of future water supply for irrigation), that the following rating has been generated:

Degree of certainty: Definite; **Significance:** HIGH; **Direction:** positive;
Time-scale: long-term; and **Spatial scale:** *Regional*.

ii. Decommissioning Phase

Decommissioning of the SGD (if and when it happens) (change process) would have an adverse impact on water abstraction, thus impacting domestic and farming⁵⁹ uses. This is particularly the case if abstraction from the Mooi River is no longer an option. Such impacts would not be responsive to mitigation if no other water sources/rivers are present. The following rating obtains:

Degree of certainty: Possible; **Significance:** VERY HIGH; **Direction:** negative; **Time-scale:** permanent; and **Spatial scale:** *local*.

4.3.5 Land and Labour Tenant Claims

The proposed SGD is not expected to impact land forming part of any potential land claims. In response to a full list of properties anticipated to be affected by the dam, the Commission on Restitution of Land Rights (23 February 2007) has gone on record stating: “...the property as mentioned above is presently not subject to any land claim. However, it is possible that claims for the property are registered with a different name in our database. Whilst great care is taken to verify the accuracy of information, the...Commission will not be responsible for any damages or loss suffered as a result of information furnished in this regard” (Ms. M. Sosibo, Land Claims Commissioner: KZN). In response to the inclusion of the provisos in the above quote, alternative property names were secured and forwarded to the

⁵⁸ Impacts on job creation discussed under separate section.

⁵⁹ A Socio-economic study confirms that one of the benefits of the Mooi-Mgeni transfer scheme “...for current irrigation farmers ... (is) the assurance of future water supply” (Conningarth Economists, October, 2007).

Commission. The Commission did not respond with any additional information about claims against the new names submitted. The above information is out of step with a 2003 report⁶⁰ by the Commission (Luthuli, 2003), stating that it “found claims against the Farm Rosetta, Spring Grove and Vaalekop (farm portions unspecified)”. It was not indicated that that time whether the claims were successful.

Furthermore, the information provided by an I&AP that a labour tenant residing on Farm Riverholm (Sub 2, Section 37) had lodged a claim (in terms of the Extension of Security of Tenure Act 62 of 1997), could not confirmed by the authorities. This was despite exhaustive inquiries at the Pietermaritzburg Department of Land Affairs (pers comm., July 2007) and the office dealing with labour tenant claims at Mooi River.

⁶⁰ Cited in DWAF Bridging Study No.4, 2004 (Nemai Consulting).

Based on the information available (some of which is contradictory or insufficient) at the time of completing the SIA, the following cautionary rating was generated in terms of labour tenant claims and land claims:

Degree of certainty: Possible; **Significance:** **CAN'T KNOW** **Direction:** negative; **Time-scale:** permanent; and **Spatial scale:** *local*.

(d) Mitigation Measures

Should successful land claims or labour tenant claims become apparent following completion of the SIA, mitigation should be in line with the legislation, including compensation and provision of alternative land. Land restoration (the preferred option⁶¹ for rural dwellers) should be pursued in cases where the affected properties are not inundated to a significant extent.

(e) Post Mitigation

Subject to successful implementation of mitigation measures and acceptance thereof by affected parties, impact certainty can be adjusted to “Unlikely”.

Table 10: Summary Table of infrastructure and land-use impacts: Operational Phase

Impact Variable	Certainty		Significance		Direction (+;-)		Time Scale		Spatial Scale	
	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.
Infrastructure impacts	Probable	Probable	HIGH	MOD.	-	N/A	Perm.	N/A	Local	N/A
Land-use impacts	Probable	Probable	MOD	LOW	-	N/A	Perm.	N/A	Local	N/A
Water abstraction ⁶²	Definite	Unlikely	HIGH	MOD	-	N/A	Perm.	N/A	Local	N/A
Land claims	Possible	Unlikely N/A	CAN'T KNOW	CAN'T KNOW	-	-	L.T	L.T.	Local	N/A

⁶¹ www.afra.co.za/default.asp?id=929: “Restitution Focus Areas”.

⁶² Excludes Mooi River Irrigation Board (see assessment).

Table 11: Summary Table of infrastructure and land-use impacts: Decommissioning Phase

Impact Variable	Certainty		Significance		Direction (+;-)		Time Scale		Spatial Scale	
	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.
Infrastructure impacts	Unlikely	N/A	NO IMPACT	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Land-use impacts	Possible	Possible	MOD	N/A	+	N/A	Perm.	N/A	Local	N/A
Water abstraction	Possible	N/A	VERY HIGH	-	N/A	N/A	Perm.	N/A	Local	N/A

4.4 SOCIO-ECONOMIC IMPACTS: EMPLOYMENT; SMMES'; BUSINESS AND TOURISM

Context:

- ▶ **This variable seeks to assess:** Any socio-economic impacts attributed to the SGD, including: (1) job creation/losses, impacts on local business; SMME development; (2) enhanced economic inequities; and (3) tourism impacts.
- ▶ **Thumbnail sketch of baseline conditions:**
 - **Employment figures:**
 - 39.5% of the population in the Mooi Mpofana Municipality is employed, whilst 31.3% is unemployed and 29% is economically not active. According to the 2001 Census Data, South Africa's employment rate is estimated at 34% and unemployment rate at 24%. 42% were not economically active.
 - 44% of the population between the ages of 15-65 years in the Umngeni Municipality is employed, whilst 23% is unemployed and 32% is not economically active (2001 Census data).
 - Provincial unemployment level : 26.2% (Stats SA, September, 2004)
 - **Skills shortage in KZN:** Has been described as 'severe' (KZN Premier Ndebele, January 2006).
 - **Schooling:**
 - 15% of the population in the Umngeni Municipality have no schooling
 - 21.5% of the population in the Umngeni Municipality have completed Grade 12
 - 26% of the population in the Mooi Mpofana Municipality have no schooling
 - 14.6% of the population in the Mooi Mpofana Municipality have completed Grade 12.

i. **Construction Phase**

(a) **Nature and extent of change processes and impacts**

The total construction costs of the MMTS-2 are set at R 350 million⁶³. Based on an assessment of the costing and engineer economics data, the construction (change) process should yield a number of job opportunities (impacts) for local individuals and SMMEs. Such opportunities would range from route clearing and grubbing; landscaping; and excavation/backfilling of trenches; to fencing and brickwork. Some of the job opportunities (e.g. route clearing and backfilling of trenches) would benefit those who are unskilled. Some mismatches between available skills (the average age of an artisan in South Africa today is 55 years of age⁶⁴), are expected in the case of brickwork as well as more specialized work such as the installation and commissioning of pumps at the SGD pump-station.

The positive impact on local business is expected to range from building material procurement and plant hire to accommodation provided to DWAF officials and engineering consultants involved in the project. An amount of R 500 000 has been allocated for the accommodation of the contractor's staff.

Both the formal and informal business sector is anticipated to benefit from the presence of contractors. Positive impacts on the informal business sector would include purchases by contract workers from local hawkers. Mobility of the hawkers, and therefore access to the target market, would serve as their most important strategic advantage. The formal business sector would benefit from purchases at local chain-stores; smaller shops; garages; and fuel depots (consumables such as diesel and lubricants).

Whilst the above impacts would be positive, they are not substantial in relation to other impacts and, very importantly, not sustainable, i.e. limited to the construction period. To put these statement into perspective and to motivate the impact rating, it is important to note that the June/July (2006) school holiday tourism period alone was expected to yield a direct economic impact (KZN province) of approximately R2

⁶³ Goba Moahloli Keeve Steyn (January, 2004).

⁶⁴ Ndebele, 2006.

bn⁶⁵. The Midlands Meander and Howick rate as the most popular places visited⁶⁶ by the domestic population and to a lesser extent, foreign tourists.

In view of the above, the job creation and local business related impacts have been rated as follows:

Degree of certainty: Probable; **Significance:** MODERATE; **Direction:** positive; **Time-scale:** short-term; and **Spatial scale:** *local*.

(b) Maximizing positive impacts

By way of maximizing the positive impacts described above, it is recommended that the project proponent (DWAF) make it incumbent (as a tender requirement) on the contractors to:

- appoint locals where practicable and feasible in terms of the requirements of the SGD construction process;
- source building material; food for workers in construction camps; and consumables (fuel; lubricants, etc.) from local businesses (both formal and informal).

ii. Operational Phase

(a) Positive Impacts

The most prominent, dramatic and far-reaching, albeit indirect, positive socio-economic impact of the proposed SGD will be through provision of water to KZN, including Durban, and Pietermaritzburg. Zooming into the Midland Region, it is evident that, “since the compilation of a Spatial Plan of the developments of significance by Umgeni Water, it has become clear that the extension of water services to these areas is crucial to ensure sustainability. The construction of the dam will result in the unlocking of more development which is hamstrung due to the lack of water provision to peri-urban and rural areas” (uMngeni Municipality, 2 May 2007).

⁶⁵ Tourism Kwa-Zulu Natal, June 2006.

⁶⁶ Zulu Kingdom (undated). www.kzn.org.za.

Furthermore, the proposed SGD is expected to have a positive socio-economic impact (mainly derived from tourism and recreational spending) in the immediate vicinity as well as the Midlands Meander as a whole. The water surface is set to be made available for recreational purposes⁶⁷, including fishing and water sports. Those property owners, who no longer wish to pursue farming, either due to partial inundation of their properties (Vaalekop Smallholdings) or by choice, could sub-divide their properties and launch riparian tourism ventures or sell their properties. According to the Property Magazine (October 2005) "...the balance sheet of dairy farming is increasingly challenging and, to compound the issue, those farmers who wish to expand their operation are faced with paying inflated residential prices for what is designated as agricultural land. For many, selling-up is a real option. Equally, for the farmer who watches his neighbour's farm sell for an attractive price, it's often too tempting to resist."

In rating the positive impacts, the proposed SGD and its impact on tourism and recreational activities must be placed within the context of the current characteristics of the area which is already strongly tourism orientated and features the Midmar Dam. Whilst formidable, it can therefore not be considered novel, but is expected to play an important role in making the Midlands an even more desirable tourist destination or a permanent residential option for those wishing to 'scale down' and settle permanently. In the words of a Local Government official: "The proposed dam may have had a positive increase in value to properties in the vicinity, however, not further afield".

From a sustainability perspective and to temper the positive impacts, it is however also important to note that "development is a contested issue for those who live and work there (Midlands Meander), primarily out of a concern that this unique 'sense of place' would be tarnished or lost. That loss of 'country' would not only represent an unravelling of a lifestyle choice they hold dear, but for many, threatens a livelihood based – or partly so – on visitors escaping the rat race for a taste of the country." The locals are apparently determined that the influx does not transform country into city (Property Magazine, October 2005). I&APs interviewed echoed the sentiments and expressed concern about the irrevocable alteration of the rural character of the area.

⁶⁷ J. Geringer (DWAF, 16 April 2007: Response to question at Public Meeting.

The positive impact has been rated as follows, notably to account for the socio-economic benefit of sustained water provision to the region:

Degree of certainty: Definite; **Significance:** HIGH; **Direction:** positive; **Time-scale:** long-term and **Spatial scale:** *regional*.

(b) Negative Impacts: Recreational Fishing in the upper Mooi River

• Nature and extent of change processes and impacts

The Inchbrakie Falls currently acts as a natural barrier to migration of the Smallmouth Bass into the upper reaches of the Mooi River. Smallmouth Bass, an introduced fish species, have not been found in the catchment upstream of Inchbrakie Falls but will definitely certainly colonise the river when the proposed SGD inundate the Falls. This change process and resulting displacement of the Brown Trout by the Smallmouth Bass would impact the commercial (61% fishing industry in the upper Mooi River). According to research⁶⁸, river fishing generates an annual turnover of approximately R1.37 million, of which R1.25 million is from the affected area. This excludes other expenditure on crafts, petrol, etc. The potential loss to the economy of the Nottingham Road, Rosetta/Kamberg and Midlands Meander area would therefore be significant, notably given views by I&APs that the amounts cited above are an under-calculation: “Lifestyle nature estates for predominantly the fly fishing industry tourism are responsible for 50% of development and tourism. It probably runs into over R100 million in revenues”. Consequently, the following rating obtains:

Degree of certainty: Definite; **Significance:** HIGH; **Direction:** negative; **Time-scale:** long-term and **Spatial scale:** *regional*.

• Mitigation

The impact on the recreational trout fishing industry is expected to be fully responsive to mitigation, the core of which is a fish barrier proposed upward of the Inchbrakie Falls, on the property Coldstream⁶⁹. “The construction of a properly designed weir would effectively prevent the invasion of bass into the Upper Mooi River” (ibid). This quoted research notwithstanding, an I&AP with a stake in the fly-fishing industry

⁶⁸ IWR Source-to-Sea, January 2005.

⁶⁹ IWR Source-to-Sea, January 2005.

noted: “The fish barrier may be rendered useless with an influx of people for recreation purposes on the proposed dam”. By means of mitigation, he offered to be involved in the stocking and control of the fish species in the proposed dam.

• **Post mitigation impacts**

Following successful mitigation and bearing in mind the cautionary note of the I&AP quoted above, the rating can be adjusted as follows:

Degree of certainty: Unlikely; **Significance:** NO IMPACT; **Direction:** negative; **Time-scale:** N/A; and **Spatial scale:** N/A.

(c) **Negative Impacts: Retrenchment of farm workers**

• **Nature and extent of change processes and impacts**

Retrenchment of farm employees will result: (1) if farms/properties become unviable as a result of inundation; or (2) if farmers scaled down operations due to inundation; or (3) if property owners decide to rezone, resulting in a potential mismatch between the current skills of employees and what is required in terms of the new zoning (e.g. tourism venture). While the retrenchment of farm workers is possible, it is difficult to prospectively determine the nature and extent of retrenchments in view of the above factors. Furthermore, the number of retrenchments would also depend on ongoing water abstraction from the impoundment. As the 2002 SIA correctly stated: “the issue surrounding farm labourers is not merely a case of retrenchment and the payment of compensation packages, but a case of relocation. Further, while the property owners will do their own relocation with the cash that they receive, the farm labourers will need to be dealt with differently” (p.7-2).

Consequently, the following rating obtains:

Degree of certainty: Possible; **Significance:** HIGH; **Direction:** negative; **Time-scale:** long-term and **Spatial scale:** *local*.

• **Mitigation**

The sensible and practicable idea (SIA, 2002) that policy guidelines and procedures be created in terms of relocation, resettlement and re-establishment of the retrenched farm worker households is reiterated here. As noted, farm workers facing retrenchment should be fully involved in the development of resettlement and re-

establishment options. Compensation packages should be financial in nature but should include options that provide access to opportunities. The following are considered feasible mitigation measures (adapted from WRP Consulting Engineers, 2002) which are expected to attenuate the negative impacts:

- Monetary compensation and relocation costs;
- Re-skilling programmes;
- Relocation and construction of new houses;
- Extending existing homes;
- Compensatory land (may include locating additional grazing/agricultural land);
- Construction of/assistance with the construction of, facilities that are lacking in areas where farm labourers are relocated e.g. crèche, community hall, sports fields, etc. (In order to prevent duplication/squandering of resources, this should be done in consultation with the Local and District Municipalities, as similar facilities are included in the strategic/integrated development plans and budgets).
- Provision of access to improved infrastructure and service facilities;
- Improved water supply at existing house;
- Preference could be given to relocated labourers for jobs related to the construction of the dam provided they meet the stipulated criteria/requirements;
- Provision of alternative employment opportunities;
- Opportunities for alternative agriculture related jobs;

• **Post mitigation impacts**

Following successful implementation of the above mitigation measures, the rating can be adjusted as follows:

Degree of certainty: Possible; **Significance:** MODERATE; **Direction:** negative; **Time-scale:** permanent; and **Spatial scale:** *local*.

iii. Decommissioning Phase

- **(De)-construction Impacts**

A reasonable level of worker activity is expected to be necessary to decommission the SGD (should this be required in the future). These workers and the construction related activity (e.g. consumables; materials) could create some demand for goods and services, locally, thus creating positive socio-economic impacts. However, the decommissioning phase is not expected to bring about discernable socio-economic benefits that cannot be more easily and sustainably accrued from other sources (e.g. tourism). Consequently, the variable relating to '*socio-economic impacts*', has been rated as follows.

Degree of certainty: Possible; **Significance:** LOW; **Direction:** positive;
Time-scale: sporadic/intermittent and **Spatial scale:** *local*.

- **Tourism**

The void left by the SGD if/when decommissioned is expected to have a significant socio-economic impact, due to losses in the tourism and allied industries which require the body of water/surface and base their marketing on it. It would also impact those property owners who would have sub-divided and sold parts off their properties to those wanting to settle in the area permanent.

Degree of certainty: Definite; **Significance:** VERY HIGH; **Direction:** negative; **Time-scale:** permanent and **Spatial scale:** *regional*.

The impact will not respond to mitigation.

Table 12: Summary Table of Socio-economic impacts: Construction Phase

Impact Variable	Certainty		Significance		Direction (+;-)		Time Scale		Spatial Scale	
	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.
Soc-econ impacts	Probable	N/A	MOD.	N/A	+	N/A	S.T.	N/A	Local	N/A

Table 13: Summary Table of Socio-economic impacts: Operational Phase

Impact Variable	Certainty		Significance		Direction (+;-)		Time Scale		Spatial Scale	
	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.
Soc.-econ. impacts: tourism allied (sustained water supply)	Definite	N/A	HIGH	N/A	+	N/A	Perm.	N/A	Regional	N/A
Soc. Econ. impacts: fishing in upper Mooi River	Definite	Unlikely	HIGH	Nil	-	N/A	Long-term	N/A	Regional	N/A
Soc.econ. impacts: retrenchments	Possible	Possible	HIGH	MOD.	-	N/A	Perm.	N/A	Local	N/A

Table 14 Summary Table of Socio-economic impacts: Decommissioning Phase

Impact Variable	Certainty		Significance		Direction (+;-)		Time Scale		Spatial Scale	
	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.
Socio-economic impacts: business	Possible	N/A	LOW	N/A	+	N/A	Sporadic	N/A	Local	N/A
Socio-economic impacts: tourism	Definite	N/A	VERY HIGH	N/A	-	N/A	Perm.	N/A	Regional	N/A

4.5 COMMUNITY/INSTITUTIONAL ARRANGEMENTS' RELATED CHANGE PROCESSES / IMPACTS: PUBLIC INVOLVEMENT

4.5.1 Attitude formation

This variable seeks to assess changes relating to attitude formation that can be attributed to the SGD specifically. As discussed earlier, attitudes and interest group activity would not constitute impacts per se. It would rather be associated with an appraisal by I&APs of the proposed project, change events and perceived impacts. If such appraisal about the objects of thought (being the project; changes processes or impacts), includes *evaluative judgments* - positive, negative or neutral, these are by definition⁷⁰, attitudes (in short, how we feel about things). This definition was applied for purposes of a thorough content analysis of the comments received from I&APs (2002/2007) pertaining to the Spring Grove dam and the AW, suggests the following. Based on this analysis, the following evident:

- (a) The overwhelming majority of I&APs registered for the project or requested *further information*, including maps and specific property impacts (including inundation);
- (b) Generally, I&APs raised *issues* (here defined as matters they believed would require attention/study during the SIA/EIA or feedback through public participation process; or *concerns* (here defined as matters they perceived as problematic and requiring attention/study as part of the SIA/EIA or feedback through public participation process.

Attitudes or evaluative judgments (positive and negative) were limited to select I&APs and sometimes accompanied:

- By provisos (in the case of positive attitudes);
- By suggestions regarding alternatives for the project and/or mitigation measures (in the case of negative attitudes).

The most vocal negative attitudes raised related to:

- the inundation of the Inchbrakie Falls (and notably the perceived periodic exposure of the Falls if the SGD's water levels are low) as

⁷⁰ Kimble, C.E. (1990).

well as the second-order financial and intrusion impacts relating to the construction of a fish barrier weir upstream from the Falls and impact on Bushmen Paintings. In the words of an I&AP: “I am not opposed to the principle of the dam, I’m against the level they are proposing to go to. I understand the need for water, but I don’t feel it necessary to inundate those Falls. I think it will change the very nature of this valley, the ethos. If it was a dam we were seeing filled up and left filled, we would all benefit from it – it would be a wonderful asset to the area, but the very nature of the dam is that it is supplementary in nature and will be used as a ‘tidal pool’ ...and I think it will be an absolute eyesore.”

- proposed inundation of the thatched house situated above the Inchbrakie falls. (The owners have confirmed ongoing legal representation to secure the necessary relief).
- the expropriation and compensation process; time-frames and impacts on the planning of ongoing farming activities and harvesting;
- cutting-off of dairy farming operations from pastures, and intrusion/daily living impacts on farm worker accommodation on the Farm Inchbrakie due to a mooted alternative access road to the proposed fish barrier and Vaalekop smallholdings;
- impacts on the farm Springvale due to the proposed quarry, which will apparently be the subject of a formal objection.

Opposition against the proposed SGD was vocalized by the Mooi River Farmers Association (letter to public participation consultants): “on behalf of the Mooi River Farmers Association (including all water users) and the community of Mooi River/Mpofana, we hereby lodge our objections to the proposed building of the Springgrove dam at Rosetta on the basis that this development has been thrust upon us without sufficient consultation and communication”, calling for “urgent consultations with all the relevant role players in the Mooi River catchment area” (pp.1&2). Further inquiry by the author at the time of writing this report, did not yield documentation (e.g. list of signatures) to verify that the community of Mooi River/Mpofana as well as the Farmers Association was objecting to the proposed SGD.

The *general* sentiment is perhaps best encapsulated in the words of one affected party: “We accept that the Government has the right to expropriate. The Government must accept that we have the right to demonstrate. Surely we should accept that it is better to negotiate”.

None of the I&APs reported being neutral about the Spring Grove Dam / AW. Their omission to express attitudes cannot be taken to indicate positive or negative feelings.

4.5.2 Interest Group Activity

Again, interest group activity is not a social impact. If formed in direct response to the proposed project as a community articulation and mobilization tool, it can be seen as a proxy for opposition against the project.

This definition was applied for purposes of a thorough content analysis of the comments received from I&APs (2002⁷¹/2007) pertaining to the Spring Grove dam and the AW specifically, suggests the following. Based on this analysis, the following evident:

- (a) No interest groups have been formed specifically in response to the project;
- (b) No expression of intent to form interest groups in the future and/or to mobilize against the project.

4.5.3 Institutional Implications and Impacts: Local Govt. and SAPS

In assessing the proposed SGD and appurtenant works, it is important to consider institutional impacts. At the level of Local Government, the proposed SGD is seen to be positive as demand for water is increasing in the region due to development. Many developments cannot proceed without reliable water provision to support those developments. For example, the uMngeni Municipality⁷² is “booming” with 15 000 water connections to residential properties; and an additional 4 500 requests on the table. There is a “dynamic boom” in this area over the last five years, both residential and industrial. An additional 750 housing units are proposed for Nottingham Rd. 1000 Housing units are proposed in the upper Dargle area as part of the ELAN Group proposal. Since 2002, the Municipality has constructed about 21 km of roads and extended water and sanitation services to over 3900 low

⁷¹ Public participation reports.

⁷² General Manager, uMngeni Municipality, 2 May 2007.

income housing units. The Mooi-Mpofana Municipality⁷³ expects the Rosetta low cost housing project to impact on water provision in the area and that the Municipality will not be able to supply that proposed settlement or any further development in the Rosetta area, i.e., where guest houses plan extensions to meet tourism needs, with water. As a local government stakeholder put it, “this is the motivation for the Spring Grove Dam. I believe it is the right thing to do.”

The Nottingham Rd. SAPS and the local Community Policing Forum (CPF) expect the construction process (and the concomitant increase in crime due to the inflow of people); development taking place in the area; and the use of the surface of the proposed SGD, to have implications for policing capacity (incl. SAPS Water-wing). In the words of the Station Commander: “My main aim is to serve and protect the community already here, as well as people coming in.”

The SAPS and Local Government expect the 2nd order impacts commensurate with the SGD in general (“unlocking of development”, *ibid*) and tourism/development (commercial/residential) related demand specifically, to have institutional implications (human resources/infrastructure). Neither, however, seem to view this in a negative light. They seem to welcome the prospect of being able to secure the necessary resources to meet their obligations to the region in general. It would indeed facilitate their ability to discharge their responsibilities and Constitutional Mandate as enshrined in the Bill of Rights (SA Constitution, 1996). Given the above, these institutional impacts are rated as follows:

Degree of certainty: Probable; **Significance:** HIGH; **Direction:** positive; **Time-scale:** permanent; and **Spatial scale:** *regional*.

Table 15: Summary Table of Impacts: Operational Phase: Local Govt. & SAPS

Impact Variable	Certainty		Significance		Direction (+;-)		Time Scale		Spatial Scale	
	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.
Institutional Impacts: Local Govt. & SAPS	Probable	N/A	HIGH	N/A	+	+	N/A	N/A	Reg.	N/A

⁷³ Manager, Water and Sanitation, May 2007.

4.6 INTRUSION IMPACTS

This variable seeks to assess visual; dust; malodor and noise impacts (collectively defined as intrusion impacts), keeping in mind that, from a baseline perspective the area around the Vaalekop smallholdings and Inchbrakie is very quiet, with few sources of dust pollution.

4.6.1 Dust / Air pollution Impacts

i. Construction Phase

(a) Nature and extent of change processes and impacts

The main change processes with a bearing on this variable are:

- construction activity *on-site*, including the pump-station and river flow gauging weirs (situated immediately on the Mooi River immediately downstream from the proposed Spring Grove Dam and beyond the current Mpofana outfall) .
- construction activity, including excavation, building of the dam wall, laying pipes and backfilling along the new rising main servitude
- construction vehicle movement along dirt roads and past dwellings.

The impact resulting from this change process would be dust/air pollution (including diesel fumes), affecting:

- individuals/families residing and/or working on the properties earmarked for the SGD related infrastructure described above;
- individuals/families residing next to haul roads as well as pedestrians and motorists using haul roads (given the proximity (only meters in some instances) of the proposed alternative access road to the fish barrier and Vaalekop smallholdings to farm worker accommodation on Farm Inchbrakie, these can be considered impact focal points).

Proximity to the sources of dust/air pollution and land uses, inter alia, would result in the impacts manifesting differentially from locality to locality. In view of the above, this variable has been rated as follow:

Degree of certainty: Probable; **Significance:** MODERATE; **Direction:** negative; **Time-scale:** short-term; and **Spatial scale:** *local*.

(b) Mitigation Measures

In the case of the variable 'dust impacts', mitigation is anticipated to be entirely achievable. The following mitigation measures are proposed:

- regular spraying of construction sites and dirt roads with water as a dust suppression measures;
- proper maintenance of all construction equipment in order to limited air pollution;
- adherence to traffic rules, notably the speed limit / no reckless driving to minimize dust.

(c) Post mitigation impacts

Following successful introduction of mitigation measures, the rating of the variable can be adjusted as follows:

Degree of certainty: Possible; **Significance:** LOW; **Direction:** negative; **Time-scale:** sporadic/intermittent; and **Spatial scale:** *local*.

ii. Operational Phase

During the operational phase of the SGD, dust/air pollution impacts will be negligible and emanating from change processes associated with maintenance activity. The following rating accrues:

Degree of certainty: Unlikely; **Significance:** VERY LOW; **Direction:** negative; **Time-scale:** long-term and **Spatial scale:** *local*.

iii. Decommissioning Phase

A reasonable level of worker activity is expected to be necessary to decommission the SGD (should this be required in the future). The activity (change process), however, is not expected to be on-par with that of the construction phase. Consequently, the variable '*dust/air pollution impacts*', has been rated as follows.

Degree of certainty: Probable; **Significance:** MODERATE (LOW: Post Mitigation); **Direction:** negative; **Time-scale:** sporadic/intermittent and **Spatial scale:** *local*.

The same mitigation measures discussed under "construction" should be applied. This should decrease the significance to LOW (see brackets above).

4.6.2 Noise and vibration Impacts

i. Construction Phase

(a) Nature and extent of change processes and impacts

The main change processes with a bearing on this variable are construction activity (including excavation⁷⁴ and backfilling; building/construction; construction vehicles / equipment); and construction camp activity (e.g. vehicle and equipment maintenance; construction workers engaging in recreational activities). These change processes are expected to generate noise/vibration, which if perceived as intrusive (and possible resulting in anger and frustration), can be considered social impacts. Proximity to the noise and vibration sources; when they occur as well as the characteristics of the various receiving environments (e.g. built-up; topography; presence of trees; inhabited/uninhabited); are expected to play an important role as to the manifestation of impacts. Properties along the proposed new rising main servitude, the construction site (SGD) and along haul routes (including the road to the proposed quarry site; fish barrier), are expected to be most affected. Furthermore, concerns were expressed by the inhabitant (long-distance pilot requiring restful sleep) of portion 18 of Rosetta 2983 (located some 200-300m from the dam wall) about noise impacts during construction.

⁷⁴ Could include sporadic blasting, depending on the geo-technical features, .e.g. rock outcrops.

This variable has therefore been rated as follow:

Degree of certainty: Probable; **Significance:** MODERATE; **Direction:** negative; **Time-scale:** short-term; and **Spatial scale:** *local*.

(b) Mitigation Measures

The mitigation measures below are expected to attenuate the noise and vibration impacts:

- limiting noise/vibration producing activities to business hours, i.e. no construction activity after-hours / weekends or limitation thereof to activities that are not intrusive. (This may not successfully address the situation of the long-haul pilot (see above), who may have to rest during the day between flights. It is suggested that DWAF enters into discussions with this affected party to find a resolution).
- ensuring that all construction machinery is well maintained and equipped with silencers;
- compliance with traffic regulations – speed limit and orderly conduct;
- encouraging construction workers that live in construction camps to conduct themselves in a temperate fashion, i.e. no loud music.

(c) Post mitigation impacts

Following successful introduction of mitigation measures, the rating of the variable can be adjusted as follows:

Degree of certainty: Possible; **Significance:** LOW; **Direction:** negative; **Time-scale:** short-term; and **Spatial scale:** *local*.

ii. Operational Phase

During the operational phase, noise and vibration impacts are expected to be limited to maintenance activity; the river-flow gauging weirs; and the pump-station at the proposed SGD. Concerns were expressed by the inhabitant (long-distance pilot requiring restful sleep) of portion 18 of Rosetta 2983 (located some 200-300m from the dam wall) about noise impacts emanating from the pump-station on the property.

However, noise attenuation, particularly in an enclosed pump-station structure should be achievable.

Also bearing in mind the very low population densities at the dam site and the presence of natural sounds (rivers), this variable has been rated as follows:

Degree of certainty: Possible; **Significance:** LOW; **Direction:** negative; **Time-scale:** long-term and **Spatial scale:** *local*.

Note: 2nd order noise and vibration impacts (powerboats; wet-bikes) could arise depending on the policy regarding the use of the surface of the dam, which is presently not in-hand and can therefore not be assessed prospectively.

iii. **Decommissioning Phase**

A reasonable level of worker activity is expected to be necessary to decommission the SGD (should this be required in the future). The activity (change process), however, is not expected to be on-par with that of the construction phase. Consequently, the variable '*noise/vibration impacts*', has been rated as follows.

Degree of certainty: Probable; **Significance:** LOW (VERY LOW: Post Mitigation); **Direction:** negative; **Time-scale:** short-term and **Spatial scale:** *local*.

The same mitigation measures discussed under "construction" should be applied. This should decrease the significance to LOW (see brackets above).

4.6.3 **Visual, Aesthetic and Sense of place related impacts**

i. **Construction Phase**

(a) **Nature and extent of change processes and impacts**

The main change processes with a bearing on this variable are:

- construction activity, including excavation, laying pipes and backfilling along the new rising main and the proposed dam site;
- the structures that will arise based on the construction activity, being the proposed dam wall; pipelines (buried with the exception of inspection points); pump-station at the dam; and river flow measuring weir;

- main construction camp at the Spring Grove Dam site. (Exact construction camp locations are yet to be confirmed). The construction camp will very likely include some worker accommodation; a site office(s); stores; building materials (cement silos) and construction (plant) equipment; and lights (for security purposes).

Visual aesthetic perception or aesthetics can be defined as “the capacity to visually perceive a particular attribute added to other features of objects, such as form, colour or movement” (Cela-Conde, 2004, p.6321). In the case of SGD, attributes other than the features of the construction equipment/activity would therefore have to be perceived to qualify as ‘visual aesthetic perception’. More important is whether the construction related change processes would qualify as aesthetic and sense of place related impacts. Important guidance come from research on the psychological experience of sense of place, which shows *people rapidly discount a landscape as soon as the first scar occurs, rather like a stain ruining a favorite garment*. Thereafter, any additional impacts on the landscape have a correspondingly smaller effect⁷⁵.

Bearing the above in mind, it can be stated that all areas which are to feature construction activity, equipment and camps, have been developed even though their characteristics and scale differs. Whilst the novelty of the construction process / equipment and its dissimilarity from a built-up area such as a farm is expected to drawn attention and even evoke feelings of being visually intrusive, these construction-related change processes are:

- short-term; and
- expected to have a smaller effect compared to what would have been the case in a pristine environment.

This variable has therefore been rated as follow:

Degree of certainty: Probable; **Significance:** MODERATE; **Direction:** negative; **Time-scale:** short-term; and **Spatial scale:** *local*.

⁷⁵ Petrich (1993), p. 249-267. Cited by Bron, 2006.

(b) Mitigation Measures

In terms of visual/aesthetic impacts, mitigation is anticipated to be achievable. The following mitigation measures are proposed:

- location of construction camps; vehicles; fuel and toilet/washing facilities for workers away from residential areas;
- swift excavation and backfilling of trenches;
- restoration of areas to their former state, including planting of grass on existing and new servitudes to foster blending-in with the surrounding environment;
- painting of inspection points on pipelines in a color that will ensure parity with the environment;
- construction of all super-structures (dam wall; pump-station at the dam; river flow gauging weir) in a manner that will minimize visual impacts. This could include shielding of structures behind trees; limiting the height of the structures; using paints and paint techniques to facilitate blending-in with the environment.

(c) Post mitigation impacts

Following successful introduction of mitigation measures, the rating of the variable can be adjusted as follows:

Degree of certainty: Possible; **Significance:** LOW; **Direction:** negative;
Time-scale: short-term; and **Spatial scale:** *local*.

ii. **Operational Phase**

(a) Negative Impacts

• **Nature and extent of change processes and impacts**

Based on the research cited under the 'construction' section above, it can be stated that all areas in which the SGD infrastructure is to be installed already show signs of development. The characteristics of these areas range from urban settlements (e.g. Rosetta; Nottingham Rd.) to farms and holiday accommodation. This includes the areas where the river flow gauging weirs are to be constructed, although the area downstream from the proposed dam wall (site of one of the river flow gauging weirs) is more 'cluttered' than the proposed location of the second weir (beyond the

existing Mpofana outfall structure). Bearing these differences in mind, the proposed SGD infrastructure and super-structure is expected to have a smaller effect compared to what would have been the case in pristine localities⁷⁶ (given also that dams in the region are not uncommon – and offering some point of reference/familiarity). However, given that the proposed SGD would inundate another prominent and cherished natural feature (accessible, however, only to select land-owners but visible (distant) from Kamberg Rd.), i.e. the Inchbrakie Falls (resulting in the anticipated periodic submersion of a positive aesthetic/visual impact), calls for a conservative rating:

Degree of certainty: Probable; **Significance:** HIGH; **Direction:** negative; **Time-scale:** long-term and **Spatial scale:** *local*.

▪ **Mitigation Measures**

- Compared to construction related impacts, mitigation of the visual/aesthetic and intrusion impacts (lighting) pertaining to the dam wall, Inchbrakie Falls and river flow measuring weir (permanent structures) is not readily attainable. The concrete dam wall (33.5m high) and measuring weir are both sizable and remarkable ‘man-made’ structures. Whilst certainly not placed in pristine environments, people would not respond to them as natural, bearing in mind the view by Zadik (1985) that "people seem to respond to environments as natural if the areas are predominantly vegetation and do not contain human artefacts such as roads or buildings." Attitudes by locals and tourists to the effect that the proposed dam as a whole (even though ‘man’ made) and the opportunities it offers, are desirable, aesthetically pleasing and therapeutic, could be seen as offsetting/compensation for the non-natural features of the dam wall and appurtenant works. However, this would be unachievable from a down-stream line of site (Midmar dam serving as an example).
- A number of I&APs believe that, by virtue of being supplementary in nature, the proposed SGD will have fluctuating water levels, which would detract from its aesthetic character. Some expect a “mud-hole” or “tidal

⁷⁶ Or an entirely artificial, man-made structure.

pool". This issue should be addressed during the detailed design phases by means of maximizing the positive aesthetic and therapeutic potential of the SGD.

- Impacts on the Inbrakie Falls could be avoided, in the opinion of one I&AP, by reducing the level of the impoundment, thus requiring a lower dam wall with concomitant cost savings, also in terms of reduced property inundation (and compensation). Furthermore, the fish barrier would not be necessary (further costs saved) and impacts on archaeological / heritage sites would be prevented.

- **Post mitigation impacts**

Given the limited range of mitigation measures, the rating of the variable has been adjusted as follows:

Degree of certainty: Probable; **Significance:** MODERATE; **Direction:** negative; **Time-scale:** long-term; and **Spatial scale:** *local*.

(b) Positive Impacts

Discussing the diverse research showing that people overwhelmingly prefer "nature scenes" to urban and built environments, Steven Kaplan (1992) attributes the restorative value of participation with nature, particularly wilderness experiences, to the ability to fulfill several criteria: being away, extent, and fascination which is established by an environment that is conducive to meeting personal goals. The proposed SGD offers some of the above, bearing in mind that it is a quasi-natural feature. However, given the presence of other dams in the area and the fact that the dam simultaneously impacts the Inchbrakie falls (a natural feature) calls for the following rating:

Degree of certainty: Probable; **Significance:** MODERATE; **Direction:** positive; **Time-scale:** long-term; and **Spatial scale:** *local*.

iii. Decommissioning Phase

Decommissioning of the SGD (if/when it happens) would nullify any positive visual/aesthetic or therapeutic impacts. However, it would potentially also remove some of the negative impacts, e.g. by restoring the Inchbrakie Falls. The following rating accrues:

Degree of certainty: Definite; **Significance:** VERY HIGH; **Direction:** negative/positive; **Time-scale:** permanent and **Spatial scale:** *regional*.

The negative impacts will not respond to mitigation.

Table 16: Summary Table of Intrusion Impacts: Construction Phase

Impact Variable	Certainty		Significance		Direction (+;-)		Time Scale		Spatial Scale	
	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.
Dust/air pollution impacts	Probable	Possible	MOD.	LOW	-	-	Sporadic	Sporadic	Loc.	Loc.
Noise impacts	Probable	Possible	MOD.	LOW	-	-	Short-term	Short-term	Loc.	Loc.
Visual/aesthetic impacts	Probable	Possible	MOD.	LOW	-	-	Short-term	Short-term	Loc.	Loc.

Table 17: Summary Table of Intrusion Impacts: Operational Phase

Impact Variable	Certainty		Significance		Direction (+;-)		Time Scale		Spatial Scale	
	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.
Dust/air pollution impacts	Unlikely	N/A	VERY LOW	N/A	-	-	Long-term	Long-term	Loc.	Loc.
Noise impacts	Possible	N/A	LOW	N/A	-	-	Long-term	Long-term	Loc.	Loc.
Visual/aesthetic impacts	Probable	Probable	HIGH	MOD	-	-	Long-term	Long-term	Loc.	Loc.
Visual/aesthetic impacts	Probable	N/A	MOD	N/A	+	N/A	Long-term	Long-term	Loc.	Loc.

Table 18: Summary Table of Intrusion Impacts: Decommissioning Phase

Impact Variable	Certainty		Significance		Direction (+;-)		Time Scale		Spatial Scale	
	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.	Pre-Mt.	Post-Mt.
Dust/air pollution impacts	Probable	Possible	MOD.	LOW	-	-	Sporadic	N/A	Local	N/A
Noise impacts	Probable	Possible	LOW	VERY LOW	-	-	Short-term	N/A	Local	N/A
Visual/aesthetic impacts	Definite	N/A	VERY HIGH	N/A	- + ⁷⁷	-	Perm.	N/A	Local	N/A

⁷⁷ Restoration of the Inchbrakie Falls.

5. SUMMARY AND CONCLUSIONS

5.1 POPULATION IMPACTS

5.1.1 Construction Phase:

The significance and probability of *population related impacts* is high (negative impact). Mitigation is expected to attenuate impacts relating to the inflow of outsiders seeking jobs and changes in population composition. However, dissuading outsiders (including illegal immigrants) from accessing what are a relatively small number of jobs and employing locals instead, is not expected to be a completely successful mitigation strategy. In this regard it should be noted that influx could take place on the back of rumors about jobs available rather than the real number. The construction project would offer opportunities for criminals.

5.1.2 Operational Phase

Except for perceived employment prospects commensurate with maintenance, the proposed project is not expected to attract newcomers into the area during operation. Whilst it could manifest that the significance of this impact is very low and the time-scale sporadic. As regards changes in the racial, ethnic, gender or age composition of the population, the proposed SGD is expected to play an important *additional* role over and above the existing demographic characteristics of the area. Whilst potentially being a negative impact, it is anticipated that locals would expect demographic diversity among visitors or those planning to settle in the area. By virtue of existing experience in interacting with outsiders, they are expected to exhibit the adaptive and coping resources necessary to deal with any potential negative impacts. The impact has been rated as possible, negative but only moderate in significance.

5.1.3 Operational Phase

Decommissioning of the SGD is not expected to attract newcomers into the area at a level equal to the construction process. The impact has been rated as possible, and negative but low in significance.

5.2 RELOCATION OF INDIVIDUALS OR FAMILIES

5.2.1 Construction Phase

The relocation/resettlement of the individuals and families following expropriation (dam wall focal point) and the resultant financial and psychological impacts are

considered significant, bearing in mind that the inhabitants are elderly people. The likelihood of the impact occurring is definite and the direction negative. The impacts, however, would be responsive to mitigation, resulting in a change of significance to moderate.

5.2.2 Operational Phase

The operational phase of SGD will require expropriation and relocation of a substantial number of people, including owners, employees and their families as well as people renting but working elsewhere (e.g. Riverholm and Sub 42, Vaalekop) being cases in point). The financial and psychological consequences are considered significant, bearing in mind that the appraisal of the relocation impact, individual vulnerability, resilience and coping capacity/strategies may differ from person to person. The impact is rated negative, permanent, and probable. The latter (as opposed to a 'definite' rating) serves to allow for those properties that are only partially inundated and whose owner may therefore not require relocation. Whilst the actual process of relocation is rated as 'short-term' above, i.e. until such time that the affected parties would have resettled, the psychological consequences thereof are difficult to rate due to their subjective nature. The relocation related impacts should respond favorably to mitigation (compensation), at least as far as the tangible considerations are concerned, thus calling for a reduction in significance to 'moderate', bearing in mind that expropriation is not always seen as desirable. Necessary clarity is to be provided by the project proponent as to the process of relocating, resettling and compensating retrenched employees and their families. Compensation packages should go beyond monetary compensation and include options that provide access to opportunities. Property owners need clarity on the expropriation time-frames in order to plan further productive uses of the land.

5.2.3 Decommissioning Phase

No relocation related impacts would manifest during the decommissioning phase of the MMTS-2: SGD.

5.3 INDIVIDUAL AND FAMILY LEVEL CHANGE PROCESSES / IMPACTS

5.3.1 Construction Phase

- **Daily movement patterns:** Construction impacts on the daily movement patterns of the population are definite and significant, but expected to be sporadic. The impact would manifest on farms (construction of fish-barrier; dam-wall; pump-station; road to quarry site) and local roads. Impacts would

present differentially for people impacted, ranging potentially from a mere nuisance factor to more serious ramifications where farming activities are impeded, deadlines play a role or goods are being transported. Cumulative impacts – present/foreseeable future actions such as new developments – added to the SGD construction process, are anticipated to intensify daily movement related impacts, should construction of these developments and the SGD occur concurrently. The impacts are expected to respond particularly well to mitigation reducing the significance to moderate.

- **Public health and safety:** A central change processes associated with the construction and decommissioning process of the SGD is the presence of contracting firms and workers (legitimate and opportunists). The construction sites (e.g. at the dam wall; proposed fish barrier) as well as farms en-route, e.g. Inchbrakie and Riverholm are considered impact focal points. Safety and security impacts can range from burglary and/or armed robbery (construction site/farms) to accidents involving construction vehicles. Public health impacts can result from environmental pollution; informal dwellings set-up by job seekers (poor sanitation; run-off into rivers) and an increase in STIs. Cumulative change processes, including from trucks using local roads to avoid tolls on the N3 as well as developments unrelated to the SGD can intensify the health and safety impacts. The impacts are rated as probable and high in significance (negative). With the extensive range of practicable mitigation measures provided and subject to their successful implementation, the significance would reduce to 'moderate'.

5.3.2 Operational Phase

- **Daily movement patterns:** Operation of the proposed dam will constrain access to settlements; farmers being cut off from portions of their farms; and movement patterns of farm workers being impeded. The resultant *impact* can range from socio-economic consequences (portions of farms becoming inaccessible and therefore unviable; motor vehicle operating costs resulting from using longer, alternative routes), to mere frustration due to longer trip lengths. Impact focal points include Loteni R. (P27-3), the Vaalekop small holdings on the south bank of the Mooi River and the Inchbrakie Farm; Vaalekop smallholdings on the north bank of the Mooi River and access roads to the property Riverholm traversing the properties Riverholm 15967 and

Inchbrakie 14870. The impoundment will affect access of farm labourers and their families (south-north). Since these change processes and impacts would by far outstrip any unrelated impacts (those occurring independent from the proposed project) on movement patterns and accessibility, they are considered highly significant, long-term and negative (spatial scale: local). Mitigation is expected to be complex and/or expensive or not feasible in some instances. For example, DWAF considers the Kamberg Road, mooted as a means of alternative access, as not being feasible. In the case of access for farm workers, this impact cannot be reduced (a bridge would not be feasible), other than by providing suitable alternative access options, transport facilities or a ferry service. Since the mitigation measures are complex and/or expensive and could result in second-order impacts (e.g. on farm-worker accommodation and a dairy on Inchbrakie Farm), or not fully responsive to all movement related impacts described above, the significance rating has been reduced by one notch only to moderate.

- **Public health and safety:** Maintenance during the operational phase is not expected to generate significant impacts. However, flood related impacts (negative) were rated as possible, albeit low in significance, given that it is long standing DWAF policy to add a buffer strip to the calculated high flood level (1:100 year). Given assurances that the buffer strip will compensate for any uncertainties regarding the estimated 1:100 year high flood line, reducing or negating impacts, the significance has been reduced to very low.

5.3.3 Decommissioning Phase

- **Daily movement patterns:** Decommissioning of the proposed SGD is expected to impact daily movement patterns in a manner similar to those anticipated during construction process, calling for a moderate significance rating. Mitigation would reduce this rating to low.
- **Public health and safety:** Impacts resulting from the decommissioning process have been rated moderate in significance and low, following mitigation

5.4 IMPACTS ON TOURISM AND RECREATIONAL ACTIVITIES

5.4.1 Construction Phase

The impacts on tourism and recreation due to construction activity/workers, has been rated as low in significance, negative and local, bearing in mind the low population density in the immediate vicinity of the main construction site as well as the scope of mitigation measures (post-mitigation significance rating: very low) .

5.4.2 Operational Phase

The most prominent, dramatic and far-reaching, albeit indirect, positive socio-economic impact of the proposed SGD will be through sustained provision of water to KZN, including Durban, and Pietermaritzburg. The construction of the dam will result in the unlocking of more development (including low-income housing in Rosetta) which is hamstrung due to the lack of water provision to peri-urban and rural areas.

The proposed SGD is expected to have a positive impact on tourism and recreational activities in the immediate vicinity as well as the Midlands Meander as a whole. These impacts, however, must be placed within the context of the current characteristics of the area, which is already strongly tourism orientated and features the Midmar Dam. The SGD, whilst formidable, cannot be considered novel, but is expected to play an important role in making the Midlands an even more desirable. The positive impact has been rated as definite in certainty; moderate in significance and long-term.

Negative impacts resulting from maintenance activities have been rated as possible, and very low in significance. Negative impacts on fishing in the upper reaches of the Mooi River due to the displacement of the Brown Trout by the Smallmouth Bass (due to inundation of the Inchbrakie Falls) would be highly significant, negative, long-term and regional in scope. However, the construction of a properly designed weir upstream from the Falls, would according to research quoted, render the impact nil.

5.4.3 Decommissioning Phase

- Tourism and recreational impacts resulting from the decommissioning process (de-construction) are rated as possible but low in significance.
- The void left by the SGD if/when decommissioned is expected to impact tourism very adversely calling for an unprecedented 'very high' significance rating – the impact being regional in scope, permanent and not responsive to mitigation.

5.5 DISRUPTION OF SOCIAL NETWORKS

5.5.1 Construction Phase

Interference by construction workers/job seekers from elsewhere in local social networks can be considered a SGD related change process. This will manifest as an impact if locals perceive this interference as adversely affecting the manner which they go about servicing their social networks. If present, the above impacts could adversely affect the creation of social capital (a crucial ingredient in producing safe, happy, and productive communities). Since various factors (e.g. whether construction workers are local or illegal immigrants) will be brought to bear on the impact manifesting, it has been rated as possible but high in significance. Mitigation is not expected to respond to the impact in full. The main contractor could put in place certain rules and regulations with the objective to prevent interference in local social networks. However, mitigation would fall outside the purview of the contractor(s) in the case of disruption of social networks by newcomers in search of employment at the SGD. Consequently, the significance of the resulting impacts is seen as being moderate (one notch down from high, pre-mitigation).

5.5.2 Operational Phase

Impacts on social networks would result if impediments to movement due to the impoundment and the potential inconvenience of greater distances start to impede social networks. Since such network don't only hinge on physical interaction, the impact has been rated as probable, moderate in significance, negative and long-term. Impacts on social networks during the operational phase of the proposed SGD are expected to respond to physical mitigation measures. Of particular importance would be the needs of farm workers requiring access from the southern side of the

Mooi River to the northern side to sustain social networks. Certainty, following mitigation, has been re-rated as 'possible' and the impact as low in significance.

5.5.3 Decommissioning Phase

Impacts on social networks commensurate with decommissioning and due to the presence of workers, has been rated as possible but low in significance.

5.6 COMMUNITY RESOURCES: INFRASTRUCTURE AND LAND USE CHANGES; LAND CLAIMS

5.6.1 Construction and Operational Phase

- **Changes in community infrastructure:** The impacts on community/farm infrastructure were determined and quantified in an extremely finely grained manner during the 2002 SIA. Whilst it is possible that certain additions were made on farms and small holdings, the significance of infrastructure impacts described in 2002 is considered highly significant, negative and local. The impacts (property dependent; partial vs. full inundation) would extend to daily living (e.g. accommodation; communication; water; electricity; sanitation and access) as well as farming activity. Following successful mitigation, including careful surveying and costing of affected infrastructure as well as an empathic and understanding approach to compensation, the significance of the impact can be re-adjusted to moderate.
- **Inundation and resultant land-use changes:** Inundation of properties can be considered the change process, the land-use impacts being total, partial or minimal loss of productive land. Whilst extensive inundation would call for complete expropriation of the property affected (see section on relocation/socio-economic impacts), even partially or minimally affected farms could become non-viable in terms of current land uses, requiring land to be sold or used for other purposes. It is, with some exceptions, not clear whether the owners of properties minimally or partially affected will pursue other land uses. Moreover, compared to other impacts, minimum or partial inundation is seen to be moderate in significance, but long-term and negative. Financial compensation is expected to be a mitigation measure responsive to the physical impacts, thus reducing the impact to low in significance, post-mitigation.

- **Abstraction of water from the impoundment:** Many of the affected properties (e.g. subdivided portions of the farms Spring Vale and Vaalekop) within the proposed SGD basin are dependent upon water abstracted from the river for domestic and agricultural purposes. Being unable to do so, impacts watering of livestock, crops and (vegetable) gardens as well as impedes daily living patterns on the remaining unaffected portions of properties. Consequently, these properties may become unviable. Accordingly, the impacts on those thus affected have been rated as definite, high in significance and permanent. Following mitigation, and bearing in mind that continuing supply can only be secured by current lawful water users as per DWAF policy, the significance can be reduced to moderate, the impact becoming unlikely. Alternative supply to others abstracting water from the Mooi River should be investigated and secured. Furthermore, the specific situation of the MRIB would require attention.

- **Land claims and tenant claims:** Given contradictions in the information provided by Land Claims Commission (KZN) in 2003 and July 2007 respectively, and given that some information could not be verified, this variable was rated “possible” although significance could not be determined (rated as “CAN’T KNOW”).

5.6.2 Decommissioning Phase

Following decommissioning of the SGD and rehabilitation, land thus freed-up may be made available for other productive uses (if feasible). This is only a possibility, the significance being moderate (positive). Decommissioning of the SGD (if and when it happens) would have an adverse impact on water abstraction, thus impacting domestic and farming uses. This is particularly the case if abstraction from the Mooi River is no longer an option. The resulting impacts are rated as possible, the significance very high (negative), as mitigation would be unachievable.

5.7 SOCIO-ECONOMIC IMPACTS: EMPLOYMENT; SMMEs; BUSINESS AND TOURISM

5.7.1 Construction Phase

The construction process should yield a number of job opportunities (impacts) for local individuals and SMMEs, including those who are unskilled. Local businesses (both formal and informal) would also benefit. These impacts, whilst positive are not substantial in relation to other impacts (e.g. tourism revenue) and, very

importantly, not sustainable, i.e. limited to the construction period. The significance has been rated as moderate.

5.7.2 Operational Phase

The proposed SGD is expected to have a positive socio-economic impact (mainly derived from tourism and recreational spending) in the immediate vicinity as well as the Midlands Meander as a whole. In rating the positive impacts, the proposed SGD and its impact on tourism and recreational activities must be placed within the context of the current characteristics of the area which is already strongly tourism orientated and features the Midmar Dam. The positive impacts are rated as definite and high in significance, as water is a driver of socio-economic development in the region.

The negative impacts would result from inundation of the Inchbrakie Falls and displacement of the Brown Trout by the Smallmouth Bass. Since river fishing generates an annual turnover (probably an under-calculation) of approximately R1.37 million, of which R1.25 million is from the affected area (excluding other expenditure on crafts, petrol, etc, the potential loss to the economy of the Nottingham Road, Rosetta/Kamberg and Midlands Meander is rated as significant, long-term and regional in scope. However, mitigation by means of a properly designed weir would effectively render the impact 'nil'. A further highly significant impact resulting from the operational phase of the SGD would be the retrenchment of farm employees due to expropriation; land-use changes incompatible with skills or land being sold off. The retrenchment of farm workers is possible but it is difficult to prospectively determine the nature and extent of retrenchments (would depend on full vs. partial expropriation; land-uses changes, etc). The impacts are therefore rated as possible but high in significance. Following successful mitigation, the impact can be rated as being moderate in significance.

5.7.3 Decommissioning Phase

The decommissioning phase is not expected to bring about discernable socio-economic benefits (construction worker presence) that cannot be more easily and sustainably accrued from other sources. Significance of these impacts, whilst positive, is low. The void left by the SGD if/when decommissioned is expected to definitely create very highly significant socio-economic impacts, which will not respond to mitigation.

5.8 COMMUNITY/INSTITUTIONAL ARRANGEMENTS' RELATED CHANGE PROCESSES / IMPACTS: PUBLIC INVOLVEMENT

5.8.1 Attitude formation

Attitudes or evaluative judgments (positive and negative) were limited to select I&APs. One of the most vocal negative attitudes raised relates to the inundation of the Inchbrakie Falls (particularly if intermittent) as well as the second-order financial and intrusion impacts relating to the construction of a fish barrier weir upstream from the Falls. Cutting-off of dairy farming operations from pastures, and intrusion/daily living impacts on farm worker accommodation (Farm Inchbrakie) due to a mooted alternative access road (fish barrier; Vaalekop smallholdings) is also viewed as a significant concern. Impacts on the farm Springvale due to the proposed quarry will apparently be the subject of a formal objection. Furthermore, opposition against the proposed SGD was vocalized by the Mooi River Farmers Association: "on behalf of the Mooi River Farmers Association (including all water users) and the community of Mooi River/Mpofana, we hereby lodge our objections to the proposed building of the Springgrove dam at Rosetta on the basis that this development has been thrust upon us without sufficient consultation and communication", calling for "urgent consultations with all the relevant role players in the Mooi River catchment area".

None of the I&APs reported being neutral about the Spring Grove Dam / AW. Their omission to express attitudes cannot be taken to indicate positive or negative feelings.

5.8.2 Interest group activity

A thorough content analysis of the comments received from I&APs (2002⁷⁸/2007) pertaining to the Spring Grove dam in general and the AW specifically, suggests that no interest groups have been formed specifically in response to the project. Furthermore, no expression of intent to form interest groups in the future and/or to mobilize against the project.

5.8.3 Local Government and SAPS

Local Government and the SAPS expect the Dam to unlock development and create impacts (in the case of the SAPS also during construction). However, it is recognized that the proposed SGD dam is necessary to meet development related demand. In the case of the SAPS, it offers the opportunity to secure resources that

⁷⁸ Public participation reports.

would benefit the area as a whole. The SGD is therefore viewed in a positive light and the institutional implications as being 'par for the course'.

5.9 INTRUSION IMPACTS

5.9.1 Construction phase

Dust and air pollution due to construction activity and construction vehicle movement along dirt roads with resultant impacts on individuals / families, are expected, and therefore rated as probable and of moderate significance. Impacts would depend on distance to the receiving social environment. Mitigation is highly achievable reducing the probability and significance to low.

Noise and vibration impacts due to construction will depend on proximity to the receiving social environment; when they occur as well as the characteristics of the area (e.g.; built-up; topography; presence of trees; inhabited/uninhabited). Properties along the proposed new rising main servitude, the construction site (SGD) and along haul routes (including the road to the proposed quarry site), are expected to be most affected. These impacts are rated as probable and the significance thereof moderate. Following successful mitigation, significance would be low, yet the impact would remain possible.

Visual/aesthetic and sense of place related impacts related to the construction process; equipment/camp and structures to be built have to be considered in the light of applicable research which shows people rapidly discount a landscape as soon as the first scar occurs, rather like a stain ruining a favorite garment. Thereafter, any additional impacts on the landscape have a correspondingly smaller effect. Given that all areas to be affected have been developed (not pristine) as well as the short-term nature of the impact, would call for a moderate significance rating (negative; probable). Following successful mitigation, significance would be low, the impact occurring being possible.

5.9.2 Operational Phase

During operation of the proposed SGD, *dust and air pollution* impacts are unlikely. *Noise and vibration impacts* are expected to be limited to maintenance activity; the river flow gauging weirs and the pump-station at the proposed SGD. The potential for 2nd order negative impacts through use of the water surface (e.g. boating; camping exists). Significance is rated as low, the impact occurring being possible.

Given the research cited, it can be stated that all areas in which the SGD infrastructure is to be installed already show signs of development, although some

are more cluttered with artifacts of human inhabitation than others. Given these differences, the SGD is expected to have a smaller aesthetic/visual and sense of place related impact compared to what would have been the case in pristine localities (current existence of big and small dams offer some point of reference/familiarity). However, given that the SGD would inundate another prominent and cherished natural feature, i.e. the Inchbrakie Falls, would call for a high significance rating (certainty: probable; time-scale: long-term). Compared to construction related impacts, mitigation of the visual/aesthetic and intrusion impacts (lighting) pertaining to the dam wall, Inchbrakie Falls and river flow measuring weir (permanent structures) is not as readily attainable. Whilst the dam, as a quasi-natural feature might offset some of its artificial features (wall; measuring weir; pump-station), a conservative rating would be appropriate, the significance and probability only being reduced to moderate (certainty: probable).

5.9.3 Decommissioning Phase

Dust and air pollution commensurate with decommissioning activity is probable and moderate in significance. Construction activity is not expected to be on-par with that of the construction phase. Consequently, '*noise/vibration impacts*', has been rated as probable but of low significance (very low following mitigation). Decommissioning of the SGD (if/when it happens) would nullify any positive visual/aesthetic or therapeutic impacts, but also remove some of the negative impacts, e.g. restoration of the Inchbrakie Falls. Such impacts (positive and negative) are rated as definite and the significance as very high and not responsive to mitigation.

Based on the above summary it can be concluded in brief that:

- › Despite high significance and probability ratings, most **construction related** impacts can be mitigated, although this would require careful consideration and implementation of the attenuation measures recommended.
- › Many of the **operation related impacts** are highly significant and probable. Some of the negative impacts relate to daily movement patterns, social networks and property/infrastructure losses with their socio-economic, farming (including water abstraction), daily living and relocation/resettlement correlates. In certain instances (e.g. new access routes; impediments to social networks), mitigation would be expensive, complex or not always feasible, or a combination of these factors. Some intrusion (visual/aesthetic) related impacts should

respond favorably to mitigation, excluding the impacts on the Inchbrakie Falls. Conversely, the positive tourism and socio-economic impacts are also considered important, but of moderate significance.

- › **Decommissioning related impacts** are of moderate to low significance (deconstruction of the SGD and appurtenant works). However, should the SGD ever be decommissioned, the socio-economic and tourism related impacts, inter alia, would be highly significant, permanent and definite, and generally not responsive to mitigation.

It is furthermore emphasized that second-order impacts resulting from the community's response to the proposed SGD rather than only the dam itself (the 1st order impacts), will bring about many significant impacts with further consequences. These include property divisions (rezoning), which, if not subject to proper consideration by the authorities vis-à-vis current land-uses in many areas (agricultural zoning), could tip the balance, and irrevocably alter the current rural sense of place, which defines the area notably along the Kamberg Rd.; Loteni Rd. and the Bend. Other second order impacts could include intrusion impacts (light; noise) created by developments around and activities on, the proposed dam; the need to upgrade roads to carry more traffic; greater policing capacity to respond to crime opportunities being created by property and money in circulation.

6. RECOMMENDATIONS

It was noted at the outset that in assessing social impacts, a distinction must be drawn between the proposed project (being the SGD) and unrelated current / future changes in the physical and/or social environment. The social impacts would be the difference between the project changes and unrelated changes. In view of this and the results of the assessment, it is evident that the proposed SGD will probably bring about a number of change processes and impacts much more *significant and remarkable* than could be attributed, over time, to unrelated ones. This relates to both the physical and social environment. These and lesser impacts, both positive and negative, are the subject of this report. Bearing in mind notably those change processes resulting in significant impacts with consequences that require careful consideration and mitigation, it is recommended that:

- (a) All mitigation measures be carefully considered and implemented. Specific attention should be paid to:

- › the compensation and expropriation process, with specific emphasis on the relocation/resettlement needs of farm-workers and their families; as well as properties that face partial inundation;
 - › infrastructure and land use impacts;
 - › daily movement and social network related impacts and their mitigation (potential for 2nd order impacts: Inchbrakie).
- (b) The DWAF address the specific situation of the Mooi River Irrigation Board and its members, given the strong attitudes/opposition expressed by this body⁷⁹.
- (c) A Mitigation Monitoring Committee (MMC) comprising affected parties, the project proponent; Environmental Monitoring/Control Officer (EMO); Local Government; SAPC/CPF and the DWAF contractor, should be formally established. This committee should monitor the implementation and impact mitigation process, using the EMP as basis.

⁷⁹ A meeting was subsequently held on 17/7/07 and the stochastic report updated (refer to the minutes of the meeting appended to the EIR as Annexure F Appendix 11 and stochastic report Annexure C).

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