

**Report  
of the  
SSEC Sub-committee on  
Employment  
&  
Working and Support  
Environment**

# Report of the SSEC Sub-committee on Employment and Working and Support Environment

## Executive Summary

We have used the extensive material provided by both SKA site proponents as the basis of a comparative study of issues associated with employment and the working and support environment. Our study also uses other publically-available source material, interviews and e-mail reports from colleagues who have lived in the candidate countries, and input from a commercial company that has business interests in both Australia and South Africa.

We analyze the proposals in nine areas where the sites were requested for information: (i) relevant legislation and labor laws; (ii) work permits and visas; (iii) opportunities for employment of family members; (iv) availability and cost of skilled labor; (v) staff and family housing; (vi) staff and family living conditions; (vii) health care; (viii) health and safety plans; (ix) domestic and international transportation. In some of these areas we found that: (a) there is no significant difference between the two regions; (b) one of the regions offers a slight advantage; or (c) one of the regions offers a significant advantage. In other areas, there were differences in the strengths and weaknesses, but no clear overall advantage for either region.

We could identify no significant differences between the submissions from the two candidate sites in the relevant legislation and labor laws and the availability of staff and family housing. We found the health and safety laws in both South Africa and Australia to be of comparably high quality, but were surprised and somewhat concerned that no reference was made in the South African submission to a safety plan for MeerKAT as the Australians did for ASKAP.

Cape Town is more cosmopolitan than Perth, but presents a higher risk to personal safety. Living conditions in Geraldton, including educational opportunities and personal safety, are better than in Carnarvon. Overall living conditions for SKA staff and family appear to be somewhat better in Australia than in South Africa.

We found the Australian submission to be slightly stronger in the area of work permits and visas and for health care, and significantly so in the opportunities for employment of family members. We found the South African submission to be slightly stronger in labor costs and for access to intercontinental travel, but less favorable for domestic travel due to the unavailability commercial air service in Carnarvon.

# Report of the SSEC Sub-committee on Employment and Working and Support Environment

## I. Introductory Remarks

The SSEC Sub-committee on Employment and Working and Support Environment was formed to review the information provided by the Candidate SKA Sites on issues that relate to the recruitment and retention of both international and domestic staff, the resulting cost as it impacts the construction and operation of SKA, and to provide an assessment of the strengths and weaknesses of the submissions in these areas from the two candidate sites.

Our committee was cognizant of the importance of employment conditions as well as the working environment, not only in recruiting highly qualified staff, but also in retaining staff. Experience at other remote observatories suggests that retention may be more of an issue than recruiting, and that the happiness of family members plays an important role in these decisions. We have assumed that during the construction and operations periods SKA staff members at all levels will either be a) employees of a private company, e.g., "SKA Ltd," licensed to do business in the host country, b) organizations that are under contract to SKA Ltd or c) individuals who are employed by another organization, but who are seconded to SKA Ltd for a fixed period of time. While the employment conditions for each of them will differ, recruitment and retention ability will affect all three categories of employees.

The evaluation of employment and working conditions for the two candidate hosts is made more difficult by the complex distribution of facilities and personnel among the core site, the remote sites, the local support center staff (Carnarvon/Kimberly or Geraldton), and the headquarters staff (Cape Town or Perth). Due to the remote nature of the SKA sites in both regions, it will probably be necessary for at least some staff to work on rotating shifts and schedules to make the most efficient use of the instrument. In Chile this alternative work schedule is known as the *turno* system. *Turno* work schedules make available alternating personnel who provide continuous coverage of a given operation. Because of the distance to the site and the lack of adequate local housing and food alternatives, the employees are provided room board at the site during their scheduled work weeks. Transportation to and from the site is provided by the Observatory. These transportation costs contribute significantly to the operating costs, so it is important to minimize the number of trips. The longer rotations are more cost effective due to fewer trips per employee being required, but they may have a detrimental effect on recruitment and morale as they involve longer separations from the family.

Both Cape Town and Perth are major international cities. The Perth metropolitan area (including Freemantle) has an estimated population (2010) of 1.7 million and is considered to be among the ten most livable cities in the world. With a population of about 3 million, Cape Town is significantly larger than Perth and also offers many living amenities. About 40% of the Cape Town population speaks Afrikaans at home; for about 30% of the population, English is

the first language. Cape Town is the major tourist destination in Africa; Perth less so in Australasia due its isolation from the rest of Australia.

In Australia, Geraldton will house the first line support staff for the SKA as it is located much closer to the Murchison Radio Observatory (MRO) than Perth. The MRO can be reached with a three to four hour drive from Geraldton, compared to nearly ten hours from Perth. Due to the extensive mining operations in WA, the use of *turno* systems appears to be a normal mode of life in WA, with many residents of Perth subject to these living and working conditions.

Since most of the professional staff will reside in Cape Town or Perth/Geraldton, the remoteness of the core site and local support centers becomes less of an issue, at least for the senior scientific, technical, and administrative staff. Therefore we have focused our efforts on the employment and working conditions in Perth, Geraldton, Cape Town, and Carnarvon. Kimberly is also mentioned as a possible location for the support staff, as it is larger and has more amenities than Carnarvon. However Kimberly is 400 km distant from the support center, which is too far for a daily commute.

We note the differences in the models for supporting the remote sites. In the case of Australia-New Zealand, the remote sites receive first line support from centrally located staff in Geraldton, whereas in the case of Southern Africa first line maintenance and operational support is primarily provided by local staff living in Carnarvon. We do not have the resources to evaluate the employment rules in each state of Australia or in each country where the Southern Africa remote stations are located, nor can we evaluate individually the working environment at each of the remote sites in either Australia or South Africa. However, we suspect that will be difficult to recruit or retain employees who will be based at any of the remote sites, other than those that already live nearby.

## **II. Procedures Followed**

In addition to reviewing the extensive material provided by both site proponents, we examined relevant information available from other sources including the US. State Department “Background Notes” and “Country Specific Information,” the UK government “Travel Advice by Country,” as well information from the Canadian Office of Foreign Affairs and International Trade, and the Dutch Ministries of Foreign Affairs and Economic Affairs. In addition we conducted interviews and received written reports from colleagues who are currently living or who have lived in the candidate countries. The committee also received valuable input from a commercial company that has extensive experience doing business in both South Africa and Australia. The external sources of information that we have consulted are listed in Appendix I.

For each area and sub area that we considered, we have tried to reach one of three conclusions: a) that there is no significant difference between the two sites; b) that one or other of the sites offers a slight advantage, or c) that one or other of the sites is significantly superior in this category. In some cases, we realized that there may be significant differences, but we did not have, nor could find, the information needed to clarify the choice. In other areas, we recognized that very different factors weighed in favor of each region and we could

not make a clear distinction as to whether the differences were significant or slight. We make no attempt to give weights to these classifications, or to give relative weights for the different criteria.

We have arranged our report mostly to follow the specific RFI items of requested information from the Candidate Sites stated in the Terms of Reference to our committee with the following deviations. We have combined items 1 (employment legislation) and 4 (labor laws) as there is broad overlap in the RFI as well as in the submissions. In addition, we have included “access to international schools/education” under the category of “staff and family living conditions” along with those other criteria normally considered part of domestic life.

In each section we first summarize the information received from the two site proponents in their response to the Request for Information (RFI), then we compare their pros and cons including the use of additional material obtained from external sources including government and private web sites as well as reports from colleagues who are or who recently have been living and working in either country. In some cases, we are not able to reconcile material provided by the proponents with that received from other sources. We note these discrepancies as well as omissions from the responses, with the intention that they should be brought to the attention of the two site proponents for clarification. Where costs are discussed we have used the following exchange rates: 1€ = AUD 1.35; 1€ = 11.0 ZAR (rates as of Oct 18, 2011)

In the following sections, we discuss each category as outlined in the Terms of Reference to our committee. Where we do not explicitly discuss specific cities we use “Australia” and “South Africa” to refer to the “Australia-New Zealand” and “Southern Africa” proposals respectively.

### **III. Relevant Legislation and Labor Laws**

**Information Supplied by Australia:** Australia and New Zealand each claim to provide an open, transparent and effective regulatory and business environment with ready access to skilled labor and services, skilled migration programs, efficient bureaucracy and world-class infrastructure. An Australian government program supports sectors, regions and occupations that are expected to experience significant growth in labor demand, currently providing education and training to about 0.5 million people. A range of legislation in Australian and New Zealand is focused on ensuring that work places are safe, healthy, and fair, with domestic and international workers treated equally. In Australia, the SKA would probably be covered by the national workplace relations system, but other federal, state, and territory regulations also apply. Unions can represent workers in both Australia and New Zealand, although work time lost through union action is described as relatively low in Australia compare to other OECD countries. Both Australia and New Zealand have comprehensive legislation for ensuring the health and safety of workers. In Australia, compulsory worker compensation schemes for which the employer is responsible would require that the SKA carry significant insurance to cover claims (CSIRO pays 0.33 percent of its payroll in staff insurance), although worker injury rate compares favorably with other OECD countries. The legal systems of Australia and New

Zealand also place great importance on the elimination of discrimination over a broad range of categories. A summary of the applicable workplace legislation, instruments and organizations appears in an Appendix to the Australian response to the RFI (Attachment 23).

**Information Supplied by South Africa:** South Africa is described as possessing comprehensive legislation dealing with working conditions and the rights of employees and employers that is relevant to professional and other workers, whether South African citizens or expatriates. This legislation creates a framework for the establishment of minimum working conditions, collective bargaining, the protection of the rights of employees and employers, protection against discrimination, and other matters. This proposal's SKA personnel plan is for almost all employees to be based in South Africa and travel to remote stations outside the country as required, where they will maintain the same rights and benefits. Conditions that in general are better than the minimum required by law may be negotiated between unions and employers within a particular industry or at individual workplaces and companies. The conditions for employment for managerial or professional positions are generally not covered by collective bargaining agreements directly, but rather are set in individual employment contracts. All employees have the right to join a trade union, and have the right to strike after exhausting legally defined dispute resolution mechanisms. By law, all employers, at their expense, must provide a safe work place and compensation protection against workplace injury and disease. Deductions from employee pay include income tax, union dues, unemployment insurance and possibly additional employer life insurance, disability insurance, retirement plans, and medical plans. Although South Africa taxes its residents on their worldwide income, expatriate employees who are present in South Africa for five years or less and do not plan on permanent residency will only be subject to income tax on their South African source income. International workers may gain relief from double taxation through existing international agreements. A summary of legal regulations on employment is given in an Appendix to the South African response to the RFI (Annexes L1, L2, L3, L4, L5, L6, L7, and L8).

**Discussion and Comparison of Legislation and Labor Laws:** Both candidate site submissions provided lengthy descriptions of laws pertaining to employment and labor, including detailed appendices. These regulations appear to be quite comprehensive and cover similar issues in both regions related to working conditions, rights of employees and employers, unions/collective bargaining, safe and healthy workplaces, and protection against discrimination. Both proposals indicate that these regulations apply equally to domestic and international workers.

There are some differences between the two submissions. The South Africa proposal covered all the items that were specifically requested, while the Australian proposal did not elaborate on pay deductions or pensions. The Australian proposal provided information on both Australian and New Zealand laws related to employment and labor (but understandably weighted toward Australian law); the Southern Africa proposal provided no information on laws for countries other than South Africa. This focus on Australian and South African regulations is not too disturbing because almost all the SKA employees will be based in these countries, but since it is likely that foreign workers will travel to the other partner countries, especially those in Southern Africa, more elaboration in this area would have been useful. The Australian proposal noted that union action is relatively infrequent in Australia compared to the OECD average, but

no similar information was given for South Africa. We examined the union action statistics published by the Australian and South African governments and found that the average number of work days lost per year to union actions from 2007 to 2010 were about 50 times higher in South Africa than in Australia, although the South African population is only about 2.2 times that of Australia (the relevant websites are listed in Appendix I of this report). Significant mandatory insurance costs were noted in Australia to cover worker injuries or disease compensation; for South Africa it was only noted that the employer was responsible in this area. An Australian government program is described that supports development of workers in growing employment areas, while in South Africa there is a human capital development program in radio astronomy. The issue of avoiding possible double taxation was discussed for international workers in South Africa; no information on this was given for Australia, but it does appear that Australia has many agreements with other governments concerning double taxation (the relevant website is listed in Appendix I of this report). Neither site candidate response discussed possible regulations governing workers taking pension funds or other assets out of the country, which might be of special concern to foreign workers returning to their home countries.

Our committee members are not experts in the relevant complex international employment and labor laws, and we do not have access to appropriate consultants, so it is very difficult to judge the submissions in these areas. Given the relative uniformity of the information supplied from both regions, and our limited ability to assess it, we do not find significant differences between the two submissions in this category.

#### **IV. Work Permits and Visas**

***Information Supplied by Australia:*** Both Australia and New Zealand are described as having highly effective and successful migration programs for skilled workers, with a range of temporary and permanent visa options to suit individual circumstances. Australian and New Zealand citizens may travel freely between the two countries. In addition, it is claimed that large employers in Australia (e.g., the SKA) can arrange an agreement with the Australian government to streamline recruitment and entry processes. Australian visa options range from short term work/visitor visas for continuous stays up to 3 months (acquired online for designated countries), to temporary business visas for stays up to 4 years (median acquisition time is 23 days), to employer visas (restricted to those under 45 years of age) or regional sponsored work visas, both of which lead to permanent residence status with access to government services (acquisition time of 3 to 4 weeks for decision-ready applications). All longer-term visas allow workers to be accompanied by eligible dependents. New Zealand visa options range from visitor visas (acquired on arrival for designated countries), to temporary work visas for up to 3 years (acquisition time of 25 to 30 days), specific purpose visas for employees of foreign institutions (acquisition time of 25 to 30 days), to visas for certain occupations leading to permanent residency (acquisition time 5 days to 3 months).

***Information Supplied by South Africa:*** The experience of the South African SKA Project Office has shown that, provided the specified procedures are followed, it has been

straightforward to obtain work permits for people coming to work for the project or the universities involved, and also to extend those permits when they expire. It is claimed that the project office has also hosted many international visitors or seconded foreign staff with no delays or problems. The South African Immigration Act identifies four types of work permits for foreigners: 1) Corporate permits allow foreigners to be employed by an approved corporate applicant, for which the SKA could apply; 2) Intra-company transfer permits can allow employees of foreign companies, like the SKA, to perform services for affiliated companies in South Africa; 3) individual employees could apply for exceptional skills, quota work, or general work permits. The skilled occupation list was defined with the SKA in mind and includes astronomers and other categories required for the construction and operation of the SKA; and 4) work permits that are covered by international treaty. The timing of the work permit application process varies, depending on the type of permit applied for, and the South African government has made a commitment to improve the acquisition times. There are also precedents in South Africa for special dispensations, and the report indicates that an SKA application for exemption is likely to be viewed favorably. Any visitors to South Africa, including family members and dependents of foreigners legally working in South Africa, may apply for a non-working visitor visa to enter South Africa to accompany the foreign worker. Family members may also apply for a work permit. All of the African countries involved in the SKA have pledged to facilitate visas and work permits, and no problems have been encountered in early interactions with these countries.

***Discussion and Comparison of Work Permits and Visas:*** Both candidate site submissions provide a good description of the requested information. The information supplied indicates foreigners will have fairly easy access in these countries to work on the SKA or visit SKA-related facilities without undue delays or problems. The submissions indicate there are no problems with immediate family dependents accompanying the foreign workers or visitors.

There are some worries with each site submission. In Australia, employer sponsored visas that provide permanent resident status with access to government services, are restricted to applicants under the age of 45. However, the regional sponsored work permits visas that seem to provide similar benefits do not have this restriction. In South Africa, the statement that the government has pledged to improve visa acquisition times suggests that there had been some past problems in this area. Our committee's inquiries of several astronomers that have recently worked in Australia or South Africa seem to indicate some difficulties with delays and bureaucracy in the South African visa process, while the experience in Australia is generally more positive, but still bureaucratic. Little information is provided for the other involved countries in Southern Africa other than promises to facilitate SKA-related visas and work permits. Although the SKA personnel plan for this region indicates that few workers will travel to the other partner countries, our committee feels that some visits by skilled workers will be needed.

The bulk of the evidence seems to point toward work visas and permits not being a major problem in either region. Both submissions indicate adequate formal processes for visas and work permits. The SKA is being promoted at the highest levels of government in both regions, so there may be avenues to fix any problems that might arise. Over the last few years both regions have experienced a significant influx of foreigners to work on or interact with each of



their SKA-related programs and prototype SKA instruments, and we know of no insurmountable problems experienced by foreigners in entering and working in these countries. However, since our respondents have noted greater visa delays and bureaucracy in South Africa compared to Australia, we consider the Australian proposal to be slightly better in the area of visas and work permits.

## **V. Opportunities for Employment of Family Members**

**Information Supplied by Australia:** Spouses/partners and dependent children of all skilled migrants are eligible to work. This applies to both temporary and permanent visa holders, without restriction. Some visa options for skilled migrants, including dependents, provide permanent residency and access to government services. However, temporary visa holders are not eligible for the Australian Medicare program.

**Information Supplied by South Africa:** Non-permanent residents of RSA must have a work permit to be employed in South Africa. There are multiple types of work permit, including treaty, corporate, intra company transfer, and individual exceptional skills permits. SKA employees would probably be covered under either corporate or intra-company transfer work permits, or batches of five-year work permits might be obtained if the SKA registered with the Large Accounts Unit of the Department of Home Affairs (DHA). It is possible that the SKA will be granted exemption from the usual requirements for work permits by the Director General of Home Affairs. Spouses may apply for individual work permits, or may obtain a visitor's visa and apply to DHA for authorization to work in South Africa. There is no information on whether the same avenues are available for non-married partners or dependents.

**Discussion and Comparison of Family Member Employment:** Both candidate site submissions indicate that spouses of skilled SKA can be eligible to seek employment, but the options for non-married partners and children are less clear in the South African submission. The process seems to be more streamlined in Australia, based on responses from multiple people who have applied for visas from both countries. Personal observations from foreign astronomers living in South Africa indicate that obtaining a visa is a slow process and is complicated by a great deal of paperwork and difficulty in obtaining accurate information. This impression is reinforced by input we received from a multinational company that operates in both Australia and South Africa. Their view is that "work visas are relatively easy to obtain" in Australia, and "Getting a work permit without a concrete offer of work and subsequent sponsorship by your new South African employer is quite difficult in South Africa."

The description of the three most relevant visa options for Australia (temporary business long stay, employer nomination scheme, and regional sponsored migration scheme) all say that eligible dependents are allowed. But this does not clearly answer the question of which visa options allow partners or dependents to legally work. Based on the general assurance on this point provided elsewhere in the document, it can be assumed that at least one of the listed visa options does include permission for spouses, partners, and dependents to be employed in Australia. However, it would be useful to know if such permission applies to all three of the

relevant visa options. According to personal comments from foreign national radio astronomers, Australian visas are easy to obtain for employees and family members, including temporary business visas that allow employment of family members, but are more difficult in South Africa.

Both candidate site submissions note the existence of broad anti-discrimination laws. Both submissions mention protections against discrimination based on race, religion, sexual preference, or political views. In addition, the Australian submission explicitly includes gender, marital status, impairment, and age as protected attributes. The South African submission does not discuss these issues, but the South African Constitution also appears to provide ample protection in all of these areas (e.g., [www.fao.org/docrep/005/Y4311E/y4311e03.htm](http://www.fao.org/docrep/005/Y4311E/y4311e03.htm)).

The scale and diversity of the economies in the Perth and Cape Town regions are sufficient to provide a wide range of spouse/partner/dependent employment opportunities. This is less likely to be the case in Geraldton or Kimberley, although they are both substantial towns. The availability of appropriate employment options in these towns may depend on how many SKA staff and families reside there. There are likely to be very few employment opportunities in Carnarvon.

Overall, the Australian immigration system appears to offer a more direct route for employment of family members of SKA staff. Family members of foreign workers in South Africa are allowed to apply for work permits, but we found no information in the submitted materials on how common it is for such permits to be granted. We are aware of two partners of radio astronomers resident in South Africa who claim to have not received permission to work for remuneration.

We believe that Australia is significantly better than South Africa in this category. This evaluation is based mainly on the lack of evidence in the submitted documentation that work permit applications by family members of SKA employees in South Africa will be approved in a routine and rapid manner or even approved at all and reports from foreign colleagues living in these countries with their families.

## **VI. Availability and Cost of Skilled Labor**

**Information Supplied by Australia:** Based on the information presented in the Australian response to the RFI summarized in Table 3, page 77, there appears a general availability of personal over the relevant categories. Earnings are given as weekly rates in Australian dollars as well as in Euros and compared to average weekly earnings before tax. The data are based on 2010 government data. Detailed information is given for Australia only, but it is stated that "...New Zealand's rate is even lower...."

In Australia, there is a relatively small spread in remuneration rates among different employees with only a factor of two difference between the average salary of skilled professionals and unskilled labor.

**Information Supplied by South Africa:** Based on the information presented in the South African response to the RFI as summarized in the Table on page 140, section 11.10, there appears to be a general availability of personnel throughout the relevant categories. The availability of personnel is presented as job category numbers and average hourly cost in Euro's (base 2007) for skilled labor in the following categories: construction labor; professional engineers; architects; technical; trades; secretarial; (para) medical and security.

The numbers are based on the Aurecon Report on Cost for SKA infrastructure Table 5-19, Annex 12 and Stats SA, Labor Force Survey 2011 (not available in the data package). The hourly rates include leave, compulsory pension, industry and trade allowances and more (not specified) from which it may be deduced that these are full pre-tax costs although tax is not explicitly mentioned.

It is stated that some employment rates i.e. for construction labor, tradesman and technical wages are based on government regulated minimum wages while all others are based on private market remuneration packages, but overall it appears that a consistent overview is given. In South Africa, the salary difference between skilled professionals and other workers is considerable, (about a factor of 5). The information given applies only to South Africa and not to other African countries.

**Discussion and Comparison of Labor Costs:** There are differences in the definitions of occupation categories used in the two responses to the RFI. For example, in the RFI from Australia, no line item (i.e. occupation – size of pool - wages) is given for construction “site managers.” Also, in the Australian table, six types of professional engineering specialists are given, while there are four in the South African table. The South African table presents 3 types of occupations related to “architects,” while the Australian table presents one i.e. “architect”. Lastly, the South African table includes “security” rates (“guards”). This entry is not presented in the Australian Table.

These differences do not seem to affect the general availability of skilled workers. The South African data presents (full) hourly rates and the Australian data are (full) weekly earnings. While salaries for skilled professionals are probably on a par with global scales in both countries, salaries for locally recruited clerical staff and laborers appears to be significantly lower in Cape Town and especially Carnarvon, than in Perth or Geraldton respectively. Specifically, the competition for workers from the mining industry will be substantial. Thus labor related construction and operations costs are expected to be smaller if the SKA is located in South Africa than if it is in Australia. However, we note that South Africa is undergoing rapid economic development along with increased educational opportunities for the historically unemployed and uneducated population and that this might result in increased salaries for many workers and associated increases in the cost of living, as indeed is happening in Chile, which has resulted in increased ALMA operating costs. The impact of lower labor costs in South Africa will depend on its contribution to the overall costs, but South Africa appears to be slightly stronger than Australia in labor costs.

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## VII. Staff and Family Housing

**Information supplied by Australia:** Since employees who have responsibilities that take them to the SKA core facility will be transported in and out, their housing opportunities while at the core facility are not considered here.

Housing in Geraldton has median weekly rental rate of AUD 340 (€250); with a current vacancy rate of 4 percent. In Perth, the median weekly rental is AUD 380 (€280), with a current vacancy rate of 3.4 percent.

The median price to purchase a house in Geraldton is AUD 358,000 (€265,000 EUR); in Perth, the median price for a detached house is AUD 470,000 (€350,000). For a “multi-residential” home, the median price is AUD 405,000 (€300,000).

**Information supplied by South Africa:** “International and senior staff will probably be housed in Cape Town.” In Kimberly, a 3-bedroom, 3-bath home with garden costs 1,500,000 ZAR (€136,000);. The cost of houses in Carnarvon ranges from 300,000 ZAR (€27,000) to approximately 650,000 ZAR (€59,000) for a four- bedroom, two-bathroom house. In Cape Town apartments, to town houses, to detached homes are available. A house with three bedrooms, two baths, large living area and garden in a comfortable suburb runs about 3,300,000 ZAR (€300,000).

**Discussion and Comparison of Housing:** Housing is significantly more expensive in Geraldton compared to Carnarvon, but this is likely balanced by the attractiveness of Geraldton vs. Carnarvon as a place to live, by virtue of its larger population, availability of amenities, and climate. Perth and Cape Town are similar in housing prices, according to the proposals. We understand that all expats working for ALMA in Chile, live in rental accommodations and similar circumstances may apply to South Africa and Australia. No information was given in the proposal on the rental market for South African cities, but colleagues living in Cape Town suggest that rent for a 3-bedroom house with a nice yard runs up to 15,000 ZAR per month (€1300,) or €315 per week. Our on-line research ([www.gumtree.co.za](http://www.gumtree.co.za)) indicates a range of roughly 13,000 ZAR (€1,200) to 23,500 ZAR (€2135) per month or €275 to €490 per week for rental houses, depending on size and location. Apartments are advertised at prices typically in the range 7500 to 11,000 ZAR per month (€680 to €1000), also depending largely on the number of bedrooms and the neighborhood. The type of accommodation is not specified in the Australian proposal so it is not possible to directly compare, but it appears that Perth and Cape Town offer similar rental opportunities.

We conclude that both sites can provide acceptable housing options in Perth or Cape Town, with no significant difference in cost for a given level of accommodation. Geraldton is more expensive for housing than Carnarvon, but offers more amenities.

## VIII. Staff and Family Living Conditions

### ***Information Supplied by Australia:***

Staff and family education: Nationally, all permanent residents are entitled to attend government schools for free (“voluntary contribution”). Western Australia “makes generous provision for migrant access to government schools,” but no further detail is given. Most non-government schools, e.g., private schools with tuition required, have religious affiliation.

Geraldton has 17 primary and secondary schools and surrounding areas, including one special-needs school. Three tertiary schools are listed. Two of these are developing an SKA-relevant engineering program.

Perth has six schools which offer the International Baccalaureate. The full list of schools may be accessed through a government website. It is very long list, and is commensurate with a city of 1.7 million. Four universities are of international standards: University of Western Australia, Curtin University (note: ICRAR has nodes at both UWA and Curtin), Edith Cowan, and Murdoch University. Notre Dame (USA) has a branch in Perth. Several trade/vocational schools are listed.

Availability of Domestic Services: Shopping, banking, availability of TV, fixed and mobile telephone, and broadband internet service in Perth is comparable to that found in North America or Europe. Perth has free Wi-Fi and free bus transportation in the Central Business District. Due to the rapid growth of the population, the water supply is limited and there are some restrictions on the use of domestic water imposed. Geraldton has all the normal services expected for a city of its size including mobile phone service from several providers.

Climate: Perth, and Geraldton both enjoy pleasant year around climates although Geraldton is about 5C warmer than Perth with temperatures reaching 40 C in the summer time.

Recreation and entertainment: With its coastal location Perth enjoys attractive beaches along with various participation and spectator sports. There are more than ten professional sports teams, concerts, theater, ballet, and opera. Geraldton has a more restricted choice of leisure activities as would be expected for a city of its size, but is well known for its wind surfing opportunities. With a population of only about 37,000, Geraldton naturally has fewer city attractions than Perth, but offers a “small-town” atmosphere. There are numerous radio and TV stations in Geraldton.

Opportunity for university affiliation: The University of Western Australia and Curtin University, as well as the new International Centre for Radio Astronomy Research have recruited radio astronomers from many countries and have made Perth a world center for radio astronomy. Thus there are numerous opportunities for collaborative work with SKA staff and possible joint appointments for SKA staff.

Personal Safety: The crime rates in Perth and Geraldton are claimed to be relatively low so “the provision of security fencing or the use of security providers by household is rare given

the relatively benign crime environment characteristic of most Australian and New Zealand communities.

Health Issues: No information provided.

Human rights: It is stated that Australia has excellent an human rights record and ranks among the top six democracies in the world in terms of a “Human Development index.”

### ***Information Supplied by South Africa:***

Staff and Family Education: Cape Town has “many” public schools, and 37 private schools. The International School of Cape Town has classes that range from preschool to post-secondary. Annual tuition is 23,245 ZAR to 60,589 ZAR (€2110 to €5500) depending on the grade level. The Deutsche Internationale Schule Kapstadt is mentioned, but no details are given. The Helderberg IES International School offers an International Baccalaureate, and further five (3 international) offer British A-level studies. At the university level, the University of Cape Town and the University of the Western Cape are of international standards. There has been strong financial support via new faculty hires and graduate student bursaries.

Availability of Domestic Services: Shopping, banking, availability of radio, TV, telephone, and broadband internet service in Cape Town appears to be comparable to that found in North America or Europe. The cost of living in Cape Town is low compared with other cities of its size in the world.

Climate: Cape Town enjoys a pleasant year around sub-tropical climate with mild, wet winters, and very warm dry summers.

Recreation and Entertainment: Cape Town is one of the world’s most attractive tourist designations, and as such offers a plethora of opportunities for recreation and entertainment with numerous beaches, mountains, restaurants, museums, golf clubs and other participation and spectator sports including cricket, rugby and football.

Opportunity for university connections: The University of Cape Town, which is the rated as the top university in Africa, the University of the Western Cape, the Cape Peninsula University of Technology, the nearby Stellenbosch University, and especially the South African Astronomical Observatory may all provide opportunities for joint appointments and collaborative research.

Personal Safety: Section 10.2.1 of the Southern Africa Proposal states “There is a low to negligible threat of organized crime against SKA assets and personnel, and a low threat of theft or violent crime against the SKA assets and personnel in the areas where the SKA sites will be located, or where SKA staff will live or travel.” However, the South African submission also states, “Many South Africans resident in cities contract private security companies to provide an appropriate level of protection of their properties, and both physical and electronic barriers are commonly deployed to protect property perimeters.” Carnarvon appears to have less threat of crime.

Health Issues: No information provided.

Human Rights: The Constitution prohibits discrimination on the grounds of race, religion, sexual preference, or political views.

***Discussion and Comparison of Living Conditions:***

Education: It is difficult to directly compare educational opportunities for children, as the South African proposal was relatively sparse on this topic. A Google search indicates that there is one high school, one secondary, and one primary school in Carnarvon, as appropriate for a town of this size.. The larger number of secondary and primary schools in Geraldton (17) seems appropriate for a town of 37,000. The emphasis in the South African proposal is appropriately on the international schools in Cape Town where most of the staff will reside. We understood that families would not be encouraged to place children in the local public schools in Cape Town, but rather in one of the private international schools as seems to be the practice for South African citizens. These private schools charge tuition. Perth government schools are free for permanent residents, but we are unclear if/when migrants need to pay tuition, or how much. We anticipate that as is the case for ALMA, SKA Ltd should/would pay tuition for children of employees to attend international schools, so that may not be an issue in recruitment or retention of staff. In summary, the quality of available primary education in both Cape Town and Perth appears high and comparable, although it appears likely that tuition payments would be needed in both cases to access the better schools.

Both Cape Town and Perth have universities which meet international standards.

Carnarvon is a very small town with limited educational opportunities compared with Geraldton which has a wide range of educational options.

Domestic Services: SKA staff should find it straightforward to arrange their domestic needs in Cape Town, Perth, and Geraldton, but perhaps less so in Carnarvon which is a much smaller city with only basic services. The extent of TV, radio, and internet service in Carnarvon is unclear.

Safety: Both submissions appear to have understated the level of crime. Reported levels of crime in South Africa are described as significantly greater than in Australia in travel literature or as cautioned in the US Department of State Country Specific Information, the UK Foreign and Commonwealth Office Advisory on “Living and Travel Abroad,” and the Canadian Office of Foreign Affairs. The Canadian government reports that *South Africa has a very high level of crime. Violent crimes, including rape and murder, routinely occur and have involved foreigners.* The US State Department reports that “robberies, burglaries, and auto theft are common in Australia’s larger cities, although Perth is reported to have a relatively low crime rate.” We are cognizant that crimes are committed everywhere in the world, especially in the cities and it may be misleading to extrapolate from a few individual incidents. However, we note that the use of private security companies among South African citizens is common whereas it is rare in Australian

cities. One respondent who has lived in Cape Town for 6 years wrote, *I have been mugged once, pick pocketed once, car broken into once. My neighbour's front door was crow-barred in an attempted burglary.* We are also aware of several other criminal acts toward visiting and resident colleagues in Cape Town, although others reported no personal incidents while living in either Cape Town or Perth. Several colleagues commented on the enhanced levels of security and vigilance required in Cape Town and a greater sense of danger than in other places where they have lived.

Official government crime statistics from Cape Town and Perth indicate that the murder rate in Cape Town is more than an order of magnitude higher than that in Perth (and much higher than that in most cities in the world), but that other violent crime rates are comparable between the two cities and with other world cities. We are aware that the reported high murder rate in Cape Town is largely confined to the townships. Government crime statistics indicate that the rate of violent crime is higher in Carnarvon compared to Geraldton, with the Carnarvon rate exceeding that in Cape Town in some categories. Since we cannot verify the uniformity of reporting of crime statistics in the two regions, we put more emphasis on international organizations that compare the crime rates in these regions and on firsthand accounts from those with experience living in Perth and Cape. There appears to be a widespread perception that South African cities are not safe, which suggests that it may be more difficult to recruit foreign professionals to work in Cape Town/Carnarvon than in Perth/Geraldton.

South Africa has a high rate of road fatalities. According to the US State Department, traffic and other laws are not always strictly or fairly enforced. In Australia, collisions with kangaroos or collision avoidance measures can result in serious accidents in rural areas.

Leisure and Recreation: Cape Town is probably more cosmopolitan than Perth with a wider variety of restaurants, theaters, and museums but comparable opportunities for participating in sports and other recreational and leisure activities. Both Cape Town and Perth are reported to have significant traffic issues, especially during commuting hours; but in both cities, it is possible to leave within a short drive or even walk to existing radio astronomy facilities.

Opportunities for Joint Appointments: Both Cape Town and Perth have excellent universities. However, Perth has become one of the world's centers for radio astronomy, and as such offers significantly better opportunities for joint appointments and collaborative research, although the level of radio astronomy research in South Africa is rapidly increasing.

Cost of Living: The cost of living in Cape Town is less than that of Perth, so foreign employees are more likely to have access to luxury items in Cape Town than in Perth for things such as private pools and domestic help.

Disease: The prevalence of HIV/AIDS in South Africa where it is reported that 18% of the adult population is infected with HIV/AIDS (UNAIDS/WHO) as well as the incidence of tuberculosis and malaria may be a concern among potential foreign workers, although anti malarial medication is not required in either Cape Town or the Karoo region. The incidence of AIDS/HIV in Australia is reported to be less than 0.1% of the population. Also, of possible



concern is the regulation that requires yellow fever inoculations by all travelers flying to South Africa via yellow fever countries, including transit stopovers that require passengers to remain on the plane. This includes the many SAA flights to South Africa which stop in Dakar, Senegal. The level of infectious disease such as malaria and other insect borne sickness in Australia, is low, and is on a par with Europe and North America. Perhaps the biggest threat to health in Australia is due to the prevalence of poisonous snakes, spiders, and some sea life, but the danger of attack is small, although this could be a problem when working at the SKA site in either region.

Labor Actions: The population normalized days lost to labor actions is more than an order of magnitude higher in South Africa than in Australia.

Summary: Cape Town is more cosmopolitan than Perth, but presents a higher risk to personal safety. Living conditions in Geraldton, including educational and leisure time opportunities and personal safety appear to be significantly better than in Carnarvon. Based on the perceptions of the incidence of crime, road safety, and infectious disease, we anticipate that it will be easier to recruit and retain staff in Australia than in South Africa.

## IX. Health Care

**Information Provided by Australia:** Australia provides free health care for all permanent residents via their Medicare system, but private health insurance is common. (From page 75 of the Australian submission: “Most temporary visa holders are not eligible for Medicare (although there are some exceptions) and are advised to have private health insurance.”) Private insurance can cover dental, optical, physio-therapy, and podiatry services that are not covered by the Medicare system. Perth offers multiple high quality health care facilities, and Geraldton has both a public and private hospital as well as specialist services. There are no significant medical services available near the proposed SKA core site, but emergency care could be provided via the Royal Flying Doctors Service (based at the Meekatharra hospital, about 120 km from Murchison). No information was provided on the expected cost of private health insurance for employees or their family members.

**Information Provided by South Africa:** South Africa has a free state-provided health care system for all permanent residents, and a separate private health care system that is likely to be the preferred options for SKA staff. (Section 12.6 of the SA submission says: “Most middle-class South Africans make use of the world-leading private sector, and it is expected that SKA staff will do the same.”) The quality of care in Cape Town is very good. The cost of private health insurance is approximately €240/month for individual comprehensive coverage. Coverage for family members can be included at a reduced (but unspecified) premium per person. Group health insurance plans are often available through employers. Disability insurance is normally purchased individually.

Both public and private hospitals are available in Cape Town. Carnarvon has a small public hospital and community health center. Emergency medical services are normally provided by airlift from Carnarvon to Kimberley, Johannesburg, or Cape Town. This is covered as an added

benefit of private medical insurance. Kimberley has three private hospitals and a 24-hour emergency response service.

**Discussion and Comparison of Health Care:** Annexure M1 in the South African submission indicates that the cost of health care is similar in both countries, with scores of 0.71 and 0.67 in this category for South Africa and Australia respectively. The related scores for health care access and quality are 0.49 and 0.36 respectively, but, it is difficult to interpret these scores without knowing what information and weighting was used to determine them. However, experience of colleagues living in Perth and Cape Town suggests that health care in both cities is reasonably affordable and of high quality.

According to a compilation of salaries and expenditures in different countries, the average cost of health care in Australia (<http://www.worldsalaries.org/australia.shtml>) was approximately €700 per person in 2004. This is slightly lower than the corresponding value listed for the US. However, the seemingly low US value suggests that these national averages do not reflect the true cost for people who choose to purchase private comprehensive health care insurance. A personal observation from a foreign national radio astronomer in Australia is that private health insurance is compulsory for application for a temporary business visa.

According to a study of health insurance in South Africa done at the University of Cape Town (<http://uct-heu.s3.amazonaws.com/12FinancingSA.pdf>), the most affluent segment of the population in South Africa – those who are most likely to be covered by private medical insurance – had an average annual expenditure of slightly less than €1000 per beneficiary for health care in 2005. As for Australia, this is likely to be an underestimate since it is clearly inconsistent with the €240/month private health insurance cost estimate in the South African submission.

It appears that the availability, quality, and cost of health care is comparable in Perth and Cape Town. It is also clear that the availability of health care is significantly better in Geraldton than in Carnarvon. Based on a comparable number of hospitals in Kimberly and Geraldton we expect the availability of health care in Kimberly may be similar to that in Geraldton.

For staff based in Perth or Cape Town, there does not appear to be any significant difference in the availability, quality, or cost of health care. Multiple sources agree that, at least in the private health care sector, the quality of care in both cities is excellent. In either candidate host country most SKA staff will be likely to purchase private health care insurance, which can include dependent coverage.

For staff supporting the central SKA core site, there is a significant difference between the availability of health care between the two primary proposed housing sites (Geraldton and Carnarvon). Unlike Geraldton, Carnarvon offers no choice of health care facilities; the only option is a small public-system hospital and community health clinic.

In conclusion, we believe that Australia is slightly better than South Africa in this category. This evaluation is based mainly on the difference in health care options for staff based in Geraldton vs. Carnarvon.

## X. Health and Safety Plans

**Information Provided by Australia:** In Australia the right to a safe workplace is protected by law. In the information in the Australian response to the RFI (page 82), it is stated that “the SKA would require an occupational and safety (OHS) plan in order to comply with legislative requirements and the relevant codes of practice (see the Employment report).” The legal basis is referred to in the OHS plan e.g. OHS Act 1991, OHS (Safety arrangements) Regulations 1991 & 1994, OHS code of Practices 2008 and Safety, Rehabilitation and Compensation Act 1988. Reference is made to a comprehensive plan for operating the MRO and in the Mid-West region that has already been developed by CSIRO and is available as Attachment 21. In the Introduction of that document, it is stated that “...CSIRO aspires to Zero Harm to employers and environment...”

This plan which is over 100 pages is very detailed and covers all aspects of keeping with “...CSIRO’s proactive zero harm OHS policy” could provide the basis for the SKA OHS plan.” It deals with identifying risks and dealing with them (including poisonous snakes etc.) to maintain and manage a well designed health and safety regime on the site as well as in the area.

**Information Provided by South Africa:** In South Africa, the right to a guaranteed safe workplace is protected by law. This is put in context in Chapter 11 of the South African response to the RFI called “Employment”, section 11.4 (p137) “Health and Safety,” where reference is made to rights and duties set out in the Occupational Health and Safety Act (Annex L3) with additional requirements in the Basic Conditions and Employment Act (BCEA) and Amendments and in municipal bye-laws. These last ones are not specified but understood to be common practice.

BCEA applies to all employers and workers and regulates working conditions and associated aspects. In Annex L4, an exposition is presented of the Occupational Health and Safety Act in terms of obligations and responsibilities addressing employer and employee, inspection and recommendations etc. Specific measures required to implement the legislation are contained in terms of the Act published by the Minister of Labour. This may include the need to draft and work on the basis of a mandatory operational safety plan for the site or elsewhere, but this requirement is not made explicit.

**Discussion and Comparison of Health and Safety Plans:** Workers in South Africa are ensured a safe workplace, which is protected by law. This may include the need to draft and work on the basis of a mandatory operational safety plan for the site or elsewhere, but this requirement is not made explicit. No specific reference is made to the SKA or present experiences/arrangements on the MeerKAT site so the South African input appears limited in this respect. In Australia, people and environment are well protected by law. Its scope and workings are demonstrated by the occupational and safety (OHS) plan for the MRO and Mid-West region from the perspective that a similar document will be required for the SKA. Such a plan was not made available from e.g., the South African MeerKAT project. Based on the material available to us, Australia seems to have a slight advantage in this category.

## **XI. Domestic and International Transportation**

**Information Provided by Australia:** The Perth airport is a major hub for both domestic and international travel to Asia, North America and Europe. European travel typically requires a connection in Asia, while travel to North America requires connections in other Australian cities. The support site at Geraldton is connected to Perth with five daily round trips.

**Information Provided by South Africa:** Cape Town has 43 non-stop flights per week to various cities in Europe and the UK, as well as regular flights to various parts of Asia. There are several flights per day to the U.S. via connections in Johannesburg, as well as daily connections to Australia and South America.

**Discussion and Comparison of Transportation:** Perth and Cape Town are major cities with excellent international and domestic airline connections. The support site at Geraldton is connected to Perth with frequent flights, whereas travel from the support site near Carnarvon requires a road trip of about ten hours to reach Cape Town. We note that the MeerKAT project regularly uses charter air service between Cape Town and Carnarvon and we anticipate that this practice would be expanded to support SKA activities. In view of the long distance from Kimberly to Carnarvon, flights from Cape Town to Kimberly do not appear to be useful. There will be little need for domestic, and certainly international travel that originates in either Geraldton or in Carnarvon. Travel from Carnarvon will be more difficult than from Geraldton.

Cape Town offers significantly better connections than Perth to Europe and slightly more favorable opportunity for international travel to North America. The Australian Perth and Geraldton sites offer a more favorable opportunity for travel to Asia. We note that travel from South Africa to Europe does not involve a significant time zone change, so this is more favorable for a South African site. At present, the need for interaction of SKA staff with Europe would appear to be greater than with Asia. Although we are mindful of the Chinese role in ASKAP and the growing economic power and potential SKA involvement from Korea, Taiwan, India, and Japan the South African site appears to have a slight advantage regarding international travel.

The Remote sites: In both proposals, the remote sites are intended to be operated by local staff, but for major maintenance, access by experts with specialized equipment may be needed. This may be especially true for the Southern Africa stations. Travel from Cape Town or Perth/Geraldton/Sydney to the remote locations in either country will be comparable, making use of flights to the nearest domestic airports, although charter flights may be needed in practice. However, travel to the non-domestic remote sites is probably more straightforward between Sydney and the New Zealand sites than to the remote sites located outside South Africa. Also, most of the remote sites are located within Australia with only a few in New Zealand where there is a relatively free exchange of travel, whereas the African geography involves travel to more remote stations located in more countries where visa issues may apply.

South Africa provides significantly better access to intercontinental travel, but is less favorable for domestic travel due to unavailability commercial air service in Carnarvon.

## **XII. Outstanding Questions and Issues**

*South Africa and Australia:* What is the situation regarding the transfer of personal assets including retirement pensions contributed by the employer and/or the employee to a retirement fund, should the employee leave Australia or South Africa prior to or after retirement?

*Australia and South Africa:* It would be helpful if we better understood the detailed distribution of the size of staff permanently housed with their families in Perth/Geraldton and Cape Town/Carnarvon.

*South Africa:* How do they propose to support the HPC Center near Carnarvon? Where will professional support staff live? Please clarify the role of Kimberly. Who will live there?

*South Africa:* Due to the high cost of purchasing homes in both Cape Town and Perth/Geraldton, we believe that many of the foreign as well as domestic workers coming from other areas will chose to live in rental housing. We are aware that all of the expats working on ALMA live in rental accommodations in Santiago. We have been able to uncover, elsewhere, rental costs in Cape Town. Is there any reason why you didn't give this information? We understand that foreign workers are unlikely to be living in Carnarvon, but what about individuals from other parts of South Africa? Will they want to rent accommodation in Carnarvon?

*South Africa:* It has not been shown that the needed expertise to construct and operate the remote stations in Africa is available in the host countries to the extent that travel of professionals from South Africa will not be required. Please clarify the text at the end of Section 2.5.2. The planned South African Array will use decommissioned tracking stations in several countries throughout Africa. How were these stations supported when they were used to track telecommunications satellites? What are the visa requirements for South African citizens as well as foreign citizens in travelling between South Africa and the other African partners, and how are the rules implemented?

*South Africa and Australia:* It is stated that (page 15, Employment doc. of the Australian submission), "In many cases, particularly in Western Australia, temporary visa holders and visitors are also able to attend government schools on the same basis as local students, although that access may depend on the precise visa class and the availability of places. In some cases there may be a requirement to pay full school fees." There is a footnote given to a website <http://det.wa.au.edu/policies> which is a portal to many different documents. Please clarify under what circumstances foreign workers might have to pay tuition in government schools in Perth/Geraldton and Cape Town/Carnarvon for their children and how the quality of these schools compares with privately operated schools especially international schools?

*South Africa:* It is stated that is expected that the visa approval process will be improved. How will it be improved?

*South Africa:* It is stated that dependents can apply for work permits, but we have some evidence that these are not necessarily approved. Please comment on the reality of expecting dependents to be able to be remunerated for their work.

*South Africa:* Is there a relevant MeerKAT Health and Safety policy document that might serve as a blueprint for the SKA?

## Appendix I

### Additional Sources of Information

#### Australia

Encyclopedia of the Nations: <http://www.nationsencyclopedia.com/Asia-and-Oceania/Australia.html>  
US State Dept Country Specific Information: [http://travel.state.gov/travel/cis\\_pa\\_tw/cis/cis\\_954.htm](http://travel.state.gov/travel/cis_pa_tw/cis/cis_954.htm)  
Background notes: <http://www.state.gov/r/pa/ei/bgn/2698.htm>  
Human Rights: <http://www.state.gov/documents/organization/160084.pdf>  
Income Tax: <http://www.ato.gov.au/individuals/content.aspx?doc=/content/12333.htm>  
UK Foreign and Commonwealth Office: <http://www.fco.gov.uk/en/travel-and-living-abroad/Travel-advice-by-country/sub-saharan-africa/south-africa>  
Canada Foreign Affairs Office:  
[http://www.voyage.gc.ca/countries\\_pays/report\\_rapport-eng.asp?id=17000](http://www.voyage.gc.ca/countries_pays/report_rapport-eng.asp?id=17000)  
NL Ministry of Foreign Affairs (in Dutch): <http://www.minbuza.nl/reizen-en-landen/reisadviezen/a/australie.html>  
Labor Issues:  
<http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/6321.0.55.001Main+Features1Jun%202011?OpenDocument>  
Crime Rates: <http://www.lrc.justice.wa.gov.au/2publications/reports/homicide/P97-ch01.pdf>  
<http://www.aic.gov.au/statistics/violent%20crime.aspx>  
Business Taxes: [www.ato.gov.au/businesses/pathway.aspx?pc=001/003/122](http://www.ato.gov.au/businesses/pathway.aspx?pc=001/003/122)  
Perth: [http://en.wikipedia.org/wiki/Perth,\\_Western\\_Australia](http://en.wikipedia.org/wiki/Perth,_Western_Australia) (with references therein)  
Geraldton: <http://en.wikipedia.org/wiki/Geraldton>  
Labor Rates: <http://joboutlook.gov.au/pages/default.aspx>

#### South Africa

Encyclopedia of the Nations: <http://www.nationsencyclopedia.com/Africa/South-Africa.html>  
US State Dept Country Specific Information:  
[http://travel.state.gov/travel/cis\\_pa\\_tw/cis/cis\\_1008.html](http://travel.state.gov/travel/cis_pa_tw/cis/cis_1008.html)  
Background notes: <http://www.state.gov/r/pa/ei/bgn/2898.htm>  
Human rights: <http://www.state.gov/documents/organization/160145.pdf>  
UK Foreign and Commonwealth Office: <http://www.fco.gov.uk/en/travel-and-living-abroad/travel-advice-by-country/asia-oceania/australia>  
Canada Foreign Affairs Office:  
[http://www.voyage.gc.ca/countries\\_pays/report\\_rapport-eng.asp?id=270000](http://www.voyage.gc.ca/countries_pays/report_rapport-eng.asp?id=270000)  
NL Foreign Affairs Ministry (in Dutch): <http://www.minbuza.nl/reizen-en-landen/reisadviezen/z/zuid-afrika.html>  
Income Tax: <http://www.sars.gov.za/home.asp?pid=208>  
Labor Issues: <http://www.labour.gov.za/>  
Crime Rates: <http://www.capetown.gov.za/en/stats/CityReports/Documents/Crime%20in%20Cape%20Town%202001-2008C.pdf>  
City populations: [tiptopglobe.com](http://tiptopglobe.com)  
Cape Town: [http://en.wikipedia.org/wiki/Cape\\_Town](http://en.wikipedia.org/wiki/Cape_Town) (with references therein)  
RSA Industrial Action Report: <http://www.labour.gov.za/documents/annual-reports/industrial-action-annual-report/2010/annual-industrial-action-report-2010/?searchterm=Annual%20Industrial%20action%20report%202010>  
Discrimination: [www.fao.org/docrep/005/Y4311E/y4311e03.htm](http://www.fao.org/docrep/005/Y4311E/y4311e03.htm)

## **Appendix II Sub-Committee Membership**

Sean Dougherty, NRC, Canada, Penticton, Canada  
Patricia Henning, University of New Mexico, Albuquerque, NM  
Dayton Jones, (Secretary), JPL, Pasadena, CA  
K. I. Kellermann, Chair (NRAO, Charlottesville, VA)  
Robert Preston, JPL, Pasadena, CA  
Steve Rawlings, University of Oxford, Oxford, UK  
Arnold van Ardenne, ASTRON, Dwingeloo, Netherlands

Robert Dangio, NRAO, retired (Consultant)

## **Appendix III Sub-Committee Meetings**

The SSEWSE met by teleconference on the following dates in 2011:

14 September  
28 September  
5 October  
10 October  
17 October  
21 October

## **Appendix IV Potential Conflicts of Interest**

At the September 14 meeting the SSEWSE members reviewed their possible conflicts of interest including previous and planned visits to the candidate countries which, in some cases, were hosted by an organization within the country, as well as ongoing scientific collaborations involving MeerKAT or ASKAP. The sub-committee members agreed that none of these arrangements constituted a conflict of interest, and that each of the members would be able to objectively evaluate the available material. Indeed these past experiences gave the sub-committee valuable background to better evaluate the written submissions and other ancillary data. Individual written statements from each sub-committee member concerning their past and planned relationships with Australian and South African colleagues has been deposited with the SPDO Director.