

05 August 2015

Our Ref: J27035 / J31314  
Your Ref: Email received 07 August 2011

Legal Resources Centre  
3<sup>rd</sup> Floor  
Greenmarket Place  
54 Shortmarket Street  
Cape Town  
8001

Email: [angela@lrc.org.za](mailto:angela@lrc.org.za)

**Tshwane**

Lynnwood Corporate Park  
Block A, 1st Floor, East Wing  
36 Alkantrant Road  
Lynnwood 0081  
PO Box 35007  
Menlo Park 0102

Tel: +27 12 348 5880  
Fax: +27 12 348 5878  
Web: [www.gibb.co.za](http://www.gibb.co.za)

Dear Ms Andrews

**RE: ESKOM EIA CONCERNS FOR THE PROPOSED NUCLEAR POWER STATION AND ASSOCIATED INFRASTRUCTURE (DEA Ref. No: 12/12/20/944)**

**FOREWORD:**

We act for Earthlife Africa, Johannesburg. We enclose here our client's submission to the Revised Draft Environmental Impact Report ("Revised Draft EIAR") for the proposed Nuclear-1 Power Station (NPS). This submission is supported by:

Alternative Information and Development Centre,  
Greenpeace Africa,  
Christopher Wylde  
Hermanus Ratepayers Association  
Save Bantamsklip Campaign  
Zwartkops Conservancy  
South Durban Community Environmental Alliance  
Pelindaba Working Group  
CANE Northern Regions: Gauteng, NW Province, Mpumalanga, NP and Free State.  
St Francis Bay Residents Association  
Friends of St Francis Nature Areas (FOSTER)  
Gamtkwa KhoiSan Council  
First Indigenous Nation - Eastern Cape (FINEC)  
Women's Energy and Climate Change Forum  
Timberwatch  
Mrs. Cheron Kraak  
Earthlife Africa Cape Town  
Dr Caeleen McNaughton-Pascoe  
Supertubes Surfing Foundation  
St Francis Kromme Trust  
Renee Royal,  
Dr. A.E. Marshall  
David Fig, and Earthlife Africa eThekwini.

A further list of supporting organisations, if any, will be forwarded to you in the course of the next few days.

***This submission will evaluate the Revised DEIR against the legal requirements for such reports. It is submitted that the Revised Draft EIR fails to place relevant considerations before the decision maker as is required by the Promotion of Administrative Justice Act No 3 of 2000 (PAJA) and violates several substantive provisions of the National Environmental Management Act No 107 of 1998 (NEMA) and the regulations passed thereunder (EIA Regulations).***

**Comment 1:**

**1. Legal Context**

1.1 Promotion of Administrative Justice Act 3 of 2000:

S 6(2): "A court or tribunal has the power to judicially review an administrative action if:

- (b) a mandatory and material procedure or condition prescribed by an empowering provision was not complied with; . . .
- (e) the action was taken –
  - (iii) because irrelevant considerations were taken into account and relevant ones were not considered.

**Response 1:**

Your comment is noted.

**Comment 2:**

1.2 The Constitution of the Republic of South Africa Act 108 of 1996:

S 24: Everyone has the right –

- (a) to an environment that is not harmful to their health or well-being; and
- (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that –
  - (i) prevent pollution and ecological degradation;
  - (ii) promote conservation; and
  - (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

S 195(1): Public administration must be governed by the democratic values and principles enshrined in the Constitution, including the following principles:

- (b) Efficient, economic and effective use of resources must be promoted.

**Response 2:**

Your comment is noted.

**Comment 3:**

1.3 National Environmental Management Act (NEMA) and the Environmental Impact Assessment (EIA) Regulations:

Relevant provisions of these statutes will be referenced where applicable in the submission.

**Response 3:**

Your comment is noted.

**Comment 4:**

**2. Failure to assess socio-economic impacts of the proposed project violates NEMA and the EIA Regulations, read together with PAJA 6(2) (b).**

The preamble and principles laid out in section 2 of NEMA recognises that sustainable development requires the integration of social, economic and environmental factors in the planning, implementation and evaluation of decisions to ensure that development serves present and future generations. It

further states that ecologically sustainable development must be secured while at the same time promoting justifiable economic and social development.

Section 23 of NEMA is more specific in that it requires the actual and potential impacts on the environment, socio-economic conditions, and cultural heritage to be taken into account in environmental management. Regulations 31(2)(d) of the EIA Regulations state that the manner in which the social, economic and cultural aspects of the environment may be affected by the proposed activity must be taken into account.

Added to this section 2(4)(b) of NEMA states that environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option. The best practicable environmental option is defined in section 1 of NEMA as the option that provides the most benefit or causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term.

Regulation 17 of the EIA Regulations states that guidelines must be taken into account where they have relevance to the proposed activity. For this purpose guidelines for the Western Cape have been drafted that determine how economists are to be involved in the EIA process.<sup>1</sup> The guidelines are very clear on what should be contained in an economic report. The guidelines state that the basic function of economic specialist input is to assist in the determination of whether a project will enhance the net social welfare. This involves considering the efficiency, equity and sustainability of the project. Input from an economic specialist is especially required if there is a chance that economic impacts are likely to influence the decision of whether or not a project is desirable. The guidelines further state that macro-economic risks need to be taken into account. In fact they clearly state that where the size of the project is such that it could influence relative prices then further analysis is required to identify and assess potential risks. The guidelines go on to state that the report also needs to take into account the vulnerability of the groups impacted on. Part of the assessment should include a consideration of who benefits and who loses from the impacts associated with the project.

It is submitted that the legal context set out above mandates that the EIAR consider the economic impacts that the construction of the NPS will have on broader South Africa, rather than a focused report detailing the economic impacts on the local communities as was submitted by the EAP. Accordingly, the previous submission by Earthlife Africa<sup>2</sup> detailed the concerns with the Draft EIAR as follows:

- a. the impact on the price of electricity of the expenditure of R120bn on a NPS and how this will affect consumers, particularly the poor;
- b. the impact on household income and the taxpayer;
- c. the economic impact of a catastrophic incident on adjacent communities;
- d. the economic impact on all phases of the NPS's life including decommissioning which could be of the same order as commissioning;
- e. an indication of the costs and benefits to assess the socio-economic impacts of the project;
- f. the economic impacts of a major or serious accident;
- g. waste storage costs (current and cumulative).

It is submitted that the failure to assess these impacts results in the infringement of the environmental rights set out in both the Constitution and NEMA. Our client is concerned that the costs involved in the construction and operation of the NPS will be passed on to electricity consumers, the majority of whom are from disadvantaged backgrounds, and that these costs will be intergenerational (which is problematic given that future generations will not have benefitted from the generation of electricity from the NPS).<sup>3</sup> Both the Constitution and NEMA make specific mention of the right to have the environment protected for the benefit of both present and future generations and that development should be sustainable. It is submitted that the assessment of the above socio economic impacts as

---

<sup>1</sup> Van Zyl, H.W., de Wit, M.P. & Leiman, A. 2005. *Guideline for involving economists in EIA processes: Edition 1*. CSIR Report No ENV-S-C 2005 053 G. Republic of South Africa, Provincial Government of Western Cape, Department of Environmental Affairs & Development Planning, Cape Town. These guidelines are relevant to the extent that the NPS will be built in the Western Cape.

<sup>2</sup> Submission by Earthlife Africa to the Director of the Department of Environmental Affairs on the Draft Environmental Impact Assessment Report. Dated 29 June 2010.

<sup>3</sup> NEMA s 1 (definition of "sustainable development").

well as the assessment of cumulative economic impacts<sup>4</sup> is required in order to ensure that these constitutional imperatives are complied with.

In spite of the legal framework which clearly mandates that these (macro-economic) impacts must be assessed, and in spite of the concerns having been voiced by various I&APs including Earthlife, these impacts have not been considered in the EIAR. Not only have these concerns been ignored in the revised drafts, but they were ignored in spite of the fact that the scoping report was accepted by DEAT subject to the condition that the economic study was required to address the cost implications of the proposed NPS in relation to other electricity generating activities<sup>5</sup> and in spite of the fact that the Plan of Study reiterated this by including the following criteria for the economic impact analysis:

*“Impacts on poor (low income households), other households, fiscal impacts, balance of payment impacts and social impacts, cost implications of the proposed NPS in relation to other electricity generation activities as indicated in the long term mitigation strategy document”.*<sup>6</sup>

The economic report itself acknowledges that *the NPS is such a large capital investment (equivalent to that of six times the capital investment in Gautrain) that the economic ripple effects will go far beyond its direct boundaries.*<sup>7</sup> However, the response to Earthlife’s comments shifts the responsibility of assessing the impact of increased electricity prices to the National Energy Regulator of South Africa (“NERSA”), and avoids the legislative requirement of assessing alternative forms of electricity generation, by stating that it is the purpose of the Integrated Resource Plan<sup>8</sup> (“IRP”) to decide the relative contribution of various generation options to South Africa’s overall electricity mix. What this response fails to acknowledge is that neither NERSA’s electricity price increase process, nor the IRP constitute an equivalent mechanism for assessing the economic impacts of the project in the manner which the law suggests. Further, neither of these processes consider all the economic impacts that must be considered in the EIA, nor do they consider potential or cumulative economic impacts. It is submitted that it is a mistake to conflate these (NERSA and IRP) processes with the environmental impact assessment process and it is further submitted that doing so circumvents the requirements of NEMA.

In addition to the concerns canvassed in earlier submissions, it is submitted that it is not possible for the applicant to come into compliance with the EIA requirements for assessing the economic impacts of the project at this stage because of lack of certainty as to the specific type of plant, its design and safety mitigation features. Different types of nuclear power plants, and their safety mitigation features will generate different consequences in a major accident which will in turn result in different economic impacts. The monetary value of such economic impacts will also be different for different sites, based on issues such as population densities and the nature of the surrounding economy. Factors which may determine the range of impacts include:

- a. fuel storage options including alternatives,
- b. waste facilities and disposal methods,
- c. number of containment hulls,
- d. whether a core catcher is necessary (such technology is dependent on the type of design),
- e. the emergency zones that need to be determined,
- f. the source term,
- g. possible cost overruns,
- h. labour, expertise and material required etc.
- i. the nature of the adjacent economy, and population densities e.g. types of agriculture undertaken
- j. the extent of emergency zones

It is submitted that the cost of insurance against such impacts should be included as part of the economic impact assessment, given that it may be significant. Insurance against the consequences of nuclear accidents is usually excluded from household insurance. It is understood that the actual level of financial security and the manner in which it must be provided must be determined under the provisions of the National Nuclear Regulator Act No 47 of 1999. However, it is submitted the actual determination of the financial security is not equivalent to the assessment of the economic impact

---

<sup>4</sup> EIA Regulations 2010, regulation 22(i) (i).

<sup>5</sup> Letter from DEAT to Arcus Gibb dated 19/11/2008.

<sup>6</sup> Page 27, Plan of Study.

<sup>7</sup> Page 40, Economic Report, Revised DEIR APP E17 Economic Report.

<sup>8</sup> Government Gazette, No 34263, Vol 551, 6 May 2011.

thereof. The failure to assess this impact constitutes a failure to properly comply with statutory requirements.

A final socio economic concern is the fact that the report fails to consider the impact on land use planning in the greater Cape Town metropolitan area of locating a further nuclear plant at Duynfontein, which is to the north of Cape Town. The city has a rapidly increasing demand for housing and is landlocked by mountains and ocean, placing pressure for development on the zone to the north of the city where Koeberg is situated. A further nuclear plant at this site will in all likelihood limit development in the area for a further 100 years. The socio economic impact of such a development, which may be significant, has not been considered in the EIA.

As a result it is submitted that the report does not place all relevant socio economic information that could materially influence the decision maker before it and therefore a decision to authorise the construction of a nuclear power station based on this report would be open to legal challenge.<sup>9</sup>

#### **Response 4:**

##### Focus of the economic impact assessment

It is not factually correct, as you have stated that the economic impact assessment focuses on the economic impacts on local communities. The macro-economic assessment focuses on the potential economic impacts to the provincial economies, not only on potential local impacts.

##### Claim of infringement of environmental rights

Your claims that the Nuclear-1 project would result in infringement of environmental rights of the Constitution and NEMA refer. Your concern is that these costs are inter-generational, and you claim that future generations will not have benefitted from the generation of electricity from Nuclear-1. In view of the fact (as reasoned in Chapter 4 of the Revised Draft EIR) that the 4,000 MW of electricity to be generated by Nuclear-1 is meant to contribute to the 40,000 MW of new generation capacity required by 2025, which is meant to address both the growth in electricity demand and to replace existing ageing coal-fired power stations, it is difficult to understand your conclusion that future generations would derive no benefit from electricity to be generated by Nuclear-1. Nuclear-1 would contribute significantly (approximately 10%) to the development of this new generating capacity, and thereby provide increased security of supply to all electricity consumers in South Africa.

Your footnote 4 (with reference to the assessment of cumulative impacts) refers. There is no Regulation 22(i) (i) in the 2010 EIA regulations. Regulation 22(1) of Government Notice No. R 543 of 2010) refers to the content of Basic Assessment Reports.

##### Costs of nuclear generation in relation to other forms of electricity generation

The cost of nuclear electricity generation in relation to other forms of electricity generation is addressed in Section 5.3.3 of the Revised Draft EIR. This refers to costs as reflected in a study by the International Energy Agency as well as a study by the EPRI, undertaken specifically for the Integrated Resource Plan, and therefore reflecting the South African context. This, and other international studies, indicate that the Levelised Cost of Electricity (LCOE) of nuclear generation (the costs over the entire life cycle of generation) are comparable with other forms of generation, including coal and renewables.

Costs of electricity are approved by the National Electricity Regulator of South Africa (NERSA). Affordability of electricity to the poor is taken into consideration in setting of costs for consumers.

Your claim regarding the "legislative requirement of assessing alternative forms of generation" refers. We contend that it is not a legislative requirement, since EIA as a tool of environmental management is, by its very nature, a project-specific and location-specific tool that is not equipped to deal with strategic issues such as the choice between different forms of electricity generating technology.

The environmental application for Nuclear-1 is for a single nuclear power station, as has been the case with other power stations such as the gas-fired power stations that have been constructed at Mossel Bay and Atlantis and the Medupi and Kusile coal fired power stations currently under construction. In all these previous instances, the scope of the EIA was restricted to a specific power station on a specific site or sites within a defined geographical area. It cannot reasonably be expected that each application for a power station must revisit strategic government decisions that have been taken on the mix of generation technologies that are necessary to meet South Africa's electricity

---

<sup>9</sup> Section 6(2)(e)(iii) of PAJA Act No 3 of 2000.

needs. This is especially the case in the instance of the Nuclear-1 application, where the government has, through a consultative process, already taken a decision on the mix of generation technologies required to supply South Africa's future electricity needs for the next two decades. The EIA process, which is a project-specific environmental management tool, does not have any mandate to revisit the strategic analysis of power generation alternatives that was completed in the IRP.

In view of the project-specific nature of EIA, although economic impacts have to be (and have been) addressed in the Nuclear-1 EIA process, it is not a requirement for the Nuclear-1 EIA to assess the economic impacts of nuclear generation vs. other forms of electricity generation to come to a conclusion on which of the wide range of electricity generation technologies is preferred. Such an assessment would amount to a Strategic Environmental Assessment, which would require inputs in terms of the complete life-cycle environmental impacts of the various technologies alternatives. Furthermore, as illustrated in Section 5.3.2 of the Revised Draft EIR, the spatial requirements for different forms of technology can vary widely – for 4,000 MW of wind-generated electricity, an area between around 270,000 and 350,000 ha would be required. This would mean that site selection (already a contentious issue with a single site for a nuclear power station) would become virtually impossible. Such a large area would require potentially thousands of landowners to consent, apart from consent from interested and affected parties. Based on experience with recent EIAs for wind farms near St. Francis, similarly vociferous opposition could also be expected for renewable energy projects<sup>10</sup>.

Lack of design clarity and the claim that impacts cannot be predicted and that different designs will result in different levels of impacts in case of a major incident, resulting in different levels of economic impact.

It is common practice in EIA processes, especially for installation of industrial plants, to consider the performance of the systems and type of technology proposed to be installed, without referring to specific suppliers or manufacturers of this technology, of which there may be a range available in the market. As long as the inputs and outputs of the proposed technology are known and the environmental impacts can be predicted or deduced from these inputs and outputs with reasonable certainty, it is not necessary to know the brand name of the technology.

As has been done in other issues and response reports, it may be appropriate to explain the envelope of criteria in colloquial terms, as has been done in public meetings during the Nuclear-1 EIA process. If the envelope of criteria is compared to the specifications for buying a vehicle, this envelope may contain requirements with respect to top speed, fuel type, fuel efficiency, catalytic convertor performance, type of tyres and wheels, fuel tank size, effective range, CO<sub>2</sub> emission limits, cruise control, numbers and positions of airbags and a number of other safety systems such as ABS and EBD. The only thing that isn't specified is the brand of vehicle. Providing such a list of criteria would ensure that only a luxury vehicle with certain characteristics could qualify, but that a base model (entry-level vehicle) would not qualify. Similarly, if a vendor proposes a power station design that fails to comply with the criteria established in the Consistent Dataset, that design will not qualify for consideration.

Assuming that an authorisation is granted by the DEA, a power station design that deviates significantly from that specified in the Consistent Dataset in the Nuclear-1 EIR (Appendix C of the Revised Draft EIR) would render the design incapable of meeting the requirements of the EIR and the authorisation. Hence such a non-confirming design could not be considered for construction.

#### Impact on Nuclear-1 at Duynefontein on Cape Town's land use planning

The proposed Nuclear-1 power station will have smaller emergency planning zones (EPZs) than the KNPS. This assumption is supported by statements by the NNR. For instance, in a presentation to the Parliamentary Select Committee on Economic Development on 1 June 2010, the Chief Executive Officer of the NNR stated the following: *"One major outcome of these new designs is that the emergency planning zones, specifically the Urgent Planning Zone, which is the zone within which evacuation of the public has to be catered for, would in all likelihood be reduced from 16 km in the case of Koeberg, to a much smaller radius which could fall within the property owned by the holder ..."*

---

<sup>10</sup> Wind farms in the St. Francis area have been heavily opposed, in spite of assertions by Nuclear-1 interested and affected parties during the Nuclear-1 public participation process that St. Francis Bay stakeholders would welcome renewable energy projects.

An assessment of the implications of Nuclear-1 for planning purposes was furthermore undertaken and included in the Revised Draft EIR Version 2 (Appendix 34). The impact on land use is

	<b>Duynefontein</b>
<p><b>Direct impact on land use</b> E.g. the impact of the nuclear site as well as the emergency planning zones on urban expansion.</p>	<ul style="list-style-type: none"> <li>The proposed development will have an impact on future development of the region in terms of land that can be utilised for future development. Areas around the site will need to be protected, densities may need to be lower than if the development was not there and infrastructure upgrades will be required, especially roads.</li> </ul>
<p><b>Indirect impact on land use</b></p>	<ul style="list-style-type: none"> <li>The influx of approximately 2000 people, as projected when the site is fully operational, will not have a dramatic impact on services and facilities (indirect land uses) required to sustain them as will be the case with the Bantamsklip and Thyspunt sites. This only take into account the increase in population and not the impact of on existing policies as result of the existing Koeberg Power Station.</li> </ul>
<p><b>Compatibility with local planning instruments and policies</b></p>	<ul style="list-style-type: none"> <li>The Nuclear 1 facility is not specifically mentioned in the Municipal SDF, but existing surrounding land uses are compatible with proposed land use.</li> <li>There are some conflicts with future land use as the site is located within the growth path of the city. If the proposed development is implemented, this will have an impact on the future growth of the city i.t.o. urban form (densities allowed, etc.) and the existing risk management/ evacuation model.</li> <li>There are legislative processes in place that will require the submission of an application to the Municipality to obtain the rights for the proposed land use.</li> </ul>
<p><b>Impact in case of emergency</b></p>	<ul style="list-style-type: none"> <li>There is existing urban development around the proposed site that will be impacted upon, especially to the south and east of the site, which will be affected.</li> </ul>

	<ul style="list-style-type: none"> <li>• The site is located adjacent to an existing operational nuclear power plant.</li> </ul>
--	--

#### Lack of Insurance against nuclear accidents

In terms of the National Nuclear Regulatory Act, the operator of a nuclear facility is obliged to provide insurance. The amount that is stipulated by the NNR is R3 billion. The NNR is however currently reviewing the amount of insurance that the nuclear power operator has to provide.

#### **Comment 5:**

### **3. Failure to assess worst-case scenario impacts violates NEMA and the EIA Regulations, read together with PAJA 6(2) (b).**

EIA Regulation 31(2) (l) states that an environmental assessment report must include “an assessment of each identified potentially significant impact, including cumulative impacts, the nature of the impact, the extent and duration of the impact, the probability of an impact occurring, the degree to which the impact can be reversed, the degree to which the impact may cause irreplaceable loss of resources, and the degree to which the impact can be mitigated.”<sup>11</sup> “Significant impact” is defined in the Regulations as “an impact that by its magnitude, duration, intensity, or probability of occurrence may have a notable effect on one or more aspects of the environment.”<sup>12</sup> Under this definition, “significant impact” includes a catastrophic, worst-case scenario impact.

In addition, NEMA’s repeated focus on minimisation, prevention, and mitigation of environmental degradation<sup>13</sup> mandates an assessment of the impacts of a severe accident because such an assessment will lead to better prevention and mitigation measures. The need to carefully consider catastrophe scenarios is particularly apparent in light of the recent Fukushima nuclear disaster. The plant, operated by Tokyo Electric Power Co. (TEPCO), was protected by a seawall 5.7 meters high but unprepared for the 14 meter waves that actually hit the plant after the earthquake. TEPCO’s disaster projection scenarios for the plant had not considered the possibility of higher waves.<sup>14</sup>

The Revised DEIR fails to assess worst-case impacts. With regard to natural disasters, the EIR merely states the obvious, that an earthquake or flood may have a major negative impact on a nuclear power plant, rather than assessing the impacts that the nuclear power plant would have on the surrounding environment in the event of an earthquake or flood.<sup>15</sup> The emergency response report explicitly states, “The approach of this specialist report is different to the other specialist reports, in the sense that *it has not identified and assessed impacts.*”<sup>16</sup> With regard to health impacts, the EIR merely estimates the *probability* of accidents caused by external forces (“Category C events”) without assessing the *impacts* of such accidents, contrary to Regulation 31.

The response to this issue when raised at the Final Draft Environmental Impact Report stage was that severe accidents “fall firmly within the ambit of the NNR licensing process.”<sup>17</sup> Such reliance, however, is misplaced as an NNR license cannot function as the equivalent of an environmental authorisation under NEMA 24L. NNR authorisation establishes safety standards under normal operating conditions;<sup>18</sup> it does not meet the requirements of NEMA 24(4) (a) to measure environmental *impacts*.

It is further submitted that not only does the Revised DEIR bypass the statutory requirement to assess all identified potentially significant impacts, which includes a worst-case analysis, it is actually impossible for the applicant to assess the impacts of a catastrophe in the absence of a final design.

<sup>11</sup> EIA Regulations 2010, GNR 543 GG 33306 of 18 June 2010, Chapter 3, s 31, subsec 2(l).

<sup>12</sup> EIA Regulations 2010, GNR 543 GG 33306 of 18 June 2010, Chapter 1.

<sup>13</sup> NEMA s 2(4)(a)(i)–(iii), (vii), s 23(2)(a)–(b), s 24(1), (4)(b)(ii), (4A).

<sup>14</sup> *TEPCO details tsunami damage: Waves that hit Fukushima plant exceeded firm’s worst-case projections*, Yomiuri Shimbun (Apr. 11, 2011), available at <http://www.yomiuri.co.jp/dy/national/T110410003477.htm>.

<sup>15</sup> Revised DEIR APP E4 Seismic Risk Assessment 4.1.1(a), (f); 4.1.2(a), (f); 4.1.3(a), (f); Revised DEIR APP E16 Oceanographic Assessment at 3.1.3, 3.2.3, 3.3.3, 4.1.5, 4.2.7.

<sup>16</sup> Revised DEIR, Chapter 9, Environmental Impact Analysis, Emergency Response, at 9.23 (emphasis added).

<sup>17</sup> Revised DEIR, APP IRR 45a Long Submission ELA Final, at 16.

<sup>18</sup> See National Nuclear Regulator Act Regulations, No. R. 388 (2006) s 3–5; National Nuclear Regulator Act 47 of 1999, ch 1 (definition of “action”).



Eskom purports to base its assessments on a generic nuclear power station design,<sup>19</sup> using an “envelope” of data that includes the “highest possible values for various aspects for a range of different nuclear technology vendors,”<sup>20</sup> including Generation III reactors. But different systems will have different accident consequences. As stated above, in other words, a nuclear meltdown is not just a nuclear meltdown – rather, the specific effects of an accident will vary widely depending on factors such as the type of fuel used, the burnup rate of the fuel, and the safety mechanisms installed, all of which depend on the final design of the plant. Basing an assessment on “highest possible values” is not sufficient because the difference in impacts is not merely a matter of degree but also of quality and composition. Moreover, it is currently not possible to make generalisations about Generation III reactors as they are just beginning to enter the market and do not yet have a proven track record.<sup>21</sup>

#### **Response 5:**

Your comments are noted.

Assessment of the radiological emissions during emergency events and the readiness of the relevant role players to deal with such events is clearly within the ambit of the NNR owing to its legal mandate in terms of the National Nuclear Regulator Act, 1999 (Act No. 47 of 1999). As with many different forms of development, construction is dependent on authorisations by a number of different legal entities, including local, provincial and national authorities. Construction of such developments is reliant on all these authorisations being obtained from entities with vastly different legal mandates. Reporting requirements to satisfy all these authorisations vary hugely, and it cannot reasonably be expected that information relevant to all these authorisations should be contained in the EIR.

As indicated repeatedly in public forums and in EIA documentation, the separation between the EIA process and the NNR licensing process is based on the legislative provisions of the relevant Acts, namely the National Environmental Management Act, 1998 and the National Nuclear Regulator Act, 1999, as well as the DEA / NNR co-operative agreement, which governs the consideration of radiological issues in EIA processes and the interaction between the DEA and the NNR in terms of their respective mandates for environmental and radiological safety (See Appendix B4 of the Revised Draft EIR). The agreement clearly stipulates that issues of radiological safety and emergency planning are within the mandate of the NNR. Furthermore, it is not within the mandate of the Environmental Assessment Practitioner to question the legal mandates of either of these statutory bodies or the validity of their agreement. We must, therefore, conduct the EIA based on their mandates and their agreement.

In this regard you are also referred to the then DEAT's approval of the Scoping Report, dated 19 November 2008, where the following is stated:

2.21 All radiological issues raised during the EIA process, which are not comprehensively addressed, must be explicitly referred to the NNR to be addressed as part of their process.

This response by the DEAT clearly acknowledges that there are some radiological issues that cannot be comprehensively addressed in the EIA process and can only be addressed in the NNR's nuclear licensing process.

Nevertheless an assessment of radiological impacts (**Appendix E32**) has now been included in the Revised Draft EIR Version 2. The purpose of this assessment will be to quantify and assess the environmental (health) impacts of normal operational process and “Design Basis Accidents” (DBAs) for Nuclear-1. This assessment will also assess whether the series of external events that happened in Japan in March 2011 could reasonably be expected to cause impacts similar to those of the Fukushima Daiichi nuclear accident to a Generation III nuclear power station constructed at any of the alternative sites considered for Nuclear-1.

<sup>19</sup> *Id.*

<sup>20</sup> Revised DEIR, Chapter 9, Impact Analysis, Assumptions 9.2.2.

<sup>21</sup> See Advanced Nuclear Power Reactors, World Nuclear Association (June 2011), at <http://www.world-nuclear.org/info/inf08.html> [last accessed 28 July 2011] (discussing various types of Generation III reactors, only one of which is currently operating while others are still undergoing development, design certification, or construction).

It is to be noted that the impacts of potential rise in sea levels and meteo-tsunami events have been taken into consideration in the coastal engineering reports (Appendix E16 of the Revised Draft EIR). It is for this reason that the proposed platform height of the nuclear island is proposed to be 10 to 12 m above sea level.

Your statement of the reason for the Fukushima Daiichi incident is indeed correct. Insufficient planning was done for tsunami events and assumptions were not appropriate for a region subject to frequent earthquakes. Studies of external hazardous events that could affect the nuclear power station will be contained in the Site Safety Reports, which will be submitted to the National Nuclear Regulator as part of an application to site a nuclear installation at any of the three sites. Such studies will take into consideration lessons learned from historic accidents including the Fukushima accident and no nuclear installation will be sited in areas where it can be proven that such cannot be mitigated. An assessment of the events leading to the Fukushima Daiichi incident and the impact of this event on nuclear safety for future nuclear power stations and Nuclear-1 will be included in the next revision of the EIR.

Your statement is noted that the NNR license cannot serve as an equivalent of an authorisation under NEMA section 24L. It is to be noted that it has never been the intention of the DEA and the NNR to issues an integrated authorisation in terms of Section 24L(1)(b). As indicated by the co-operative governance agreement, these authorisations remain separate and issues that are not dealt with in the EIA process need to be referred to the NNR for consideration.

Your claim that the NNR regulations (Government Notice No. R 388 of 2006) only establishes safety standards for normal operating conditions, refers. This claim is inconsistent with the content of the said regulations. For instance, Regulation 3(8) of this notice requires planning for accident management and emergency planning, emergency preparedness and emergency response. Your claim is supported by a footnote referring to the definition of “action” under the NNR Act (Act No. 47 of 1999). Under Section 1(i) of the Act, in terms of which “action” is defined as follows:

- “(a) the use, possession, production, storage, enrichment, processing, reprocessing, conveying or disposal of or causing to be conveyed, radioactive material;
- (b) any action, the performance of which may result in persons accumulating a radiation dose resulting from exposure to ionizing radiation; or
- (c) any other action involving radioactive material.”

Given the fact that “action” is defined to include any action resulting in the accumulation of a radiation dose due to exposure to radiation, and the fact that the Regulations under the Act explicitly provide for emergency (i.e. non-normal operating conditions), your conclusion of the NNR Act only providing for normal operating conditions is contested. It is clear that the definition of “action” applies to any instance of radiation exposure, since no restriction applies with respect to normal or abnormal operating conditions.

Furthermore, Section 3.3 of GN R 388 of 2006 requires that: “*Measures to control the risk of nuclear damage to individuals must be determined on the basis of a prior safety assessment, which is suitable and sufficient to identify all significant radiation hazards and to evaluate the nature and expected magnitude of the associated risks ...*”. In terms of this requirement, it is clear that a form of assessment of the radiological risks is required. Even though the methodologies employed in such a risk assessment may not be identical to those used in environmental impact assessment, this risk assessment is specific to the nature of the radiological risks and is therefore complementary to the environmental assessment that is required by the NEMA.

#### **Comment 6:**

#### **4. Failure to assess all potential impacts of nuclear waste violates NEMA and the EIA Regulations, read together with PAJA 6(2) (b).**

EIA Regulation 31(2) (l) states that the report must include “an assessment of each identified potentially significant impact, including cumulative impacts, the nature of the impact, the extent and duration of the impact, the probability of an impact occurring, the degree to which the impact can be reversed, the degree to which the impact may cause irreplaceable loss of resources, and the degree to which the impact can be mitigated.”<sup>22</sup> “Significant impact” is defined in the Regulations as “an

<sup>22</sup> EIA Regulations 2010, GNR 543 GG 33306 of 18 June 2010, Chapter 3, s 31, subsec 2(l).

impact that by its magnitude, duration, intensity, or probability of occurrence may have a notable effect on one or more aspects of the environment.”<sup>23</sup> Radioactive waste is certainly a “significant impact” under a common sense reading of the definition, and it has been identified as such by numerous public participants,<sup>24</sup> the DEA,<sup>25</sup> and the applicant itself.<sup>26</sup>

The applicant has failed to adequately assess the impacts of generating radioactive waste. First, the EIR does not assess the cumulative impacts of generating radioactive waste, in violation of EIA Regulation 31(2) (l). The impacts of the waste to be generated by Nuclear-1 must be analysed in light of the waste already generated by Koeberg Nuclear Power Station and in addition to other existing environmental stresses in the proposed sites.

Second, the EIR does not adequately analyse the nature, extent, duration, and probability of waste impacts and the degree to which they may cause irreversible damage. The EIR merely classifies each identified potential impact (such as water contamination) as “low,” “medium,” or “high,” without any explanation as to the content of those labels and how it arrived at those conclusions. Such an “impact assessment” is meaningless and results in an incomplete EIR.

Third, the EIR does not assess the economic consequences of long-term waste disposal and storage. Economic impacts are probably the most far-reaching potential impacts of waste management, as the consequences of waste extend to future generations and radioactive emissions can continue to thousands of years,<sup>27</sup> and the costs of constructing high level waste facilities are exorbitant. The proposed Yucca Mountain high level waste repository in the U.S. was estimated in 2006 to cost \$23 billion, a 342% increase over the original estimate in 1984 (accounting for inflation).<sup>28</sup> The costs of permanent high level waste disposal is an extremely significant impact of nuclear waste; failure to mention such huge-scale impacts violates EIA Regulation 31(2)’s requirement that an EIR contain all information necessary for the authority to make a decision and PAJA’s requirement that all relevant information be presented to the decision maker (sic).

Fourth, and most alarmingly, the EIR has failed to identify the overheating of spent fuel rods as a potential impact of storing high level nuclear waste. The EIR proposes to store high level waste temporarily in spent fuel pools on-site.<sup>29</sup> These spent fuel pools pose grave safety risks because in the event of an accident, the rods could overheat, releasing radioactive gases and potentially causing a meltdown.<sup>30</sup> Overcrowding in spent fuel pools also poses risks as the pools become hotter and more radioactive.<sup>31</sup> The risk of overheating pools is particularly salient and urgent in light of the Fukushima nuclear disaster, in which a spent fuel pool overheated at Reactor No. 4 after cooling systems were knocked out by the earthquake and tsunami.<sup>32</sup> Indeed, the head of Areva’s North American unit, Jacques Besnainou, stated, “One of the things we’re discovering in Fukushima is leaving used fuel in a spent fuel pool may not be a very wise decision.”<sup>33</sup> Overcrowding is also a present danger, as the spent fuel rods at Koeberg have been re-racked to extend their operating

---

<sup>23</sup> EIA Regulations 2010, GNR 543 GG 33306 of 18 June 2010, Chapter 1.

<sup>24</sup> Revised DEIR App D8 Combined IRR Volumes Final at 157–186.

<sup>25</sup> Letter from Ms. Joanne Yawitch, Deputy Director General of Environmental Quality and Protection, DEA, to Mr. Tim Liversage, Arcus Gibb (Nov. 19, 2008) (laying out conditions under which the scoping report was to be accepted, which included assessment of nuclear waste).

<sup>26</sup> Revised DEIR, Chapter 9, Impact Analysis 9.29 and APP E29.

<sup>27</sup> See Revised DEIR, APP E29 Waste Assessment 5.2.2;

<sup>28</sup> See Marvin Resnikoff et. al., *The Hazards of Generation III Reactor Fuel Wastes: Implications for Transportation and Long Term Management of Canada’s Used Nuclear Fuel*, GREENPEACE CANADA 35 (May 2010), available at [http://www.greenpeace.org/canada/Global/canada/report/2010/5/nuclear/GP\\_REACTOR\\_FUEL\\_REPORT\\_MAY2010.pdf](http://www.greenpeace.org/canada/Global/canada/report/2010/5/nuclear/GP_REACTOR_FUEL_REPORT_MAY2010.pdf).

<sup>29</sup> Revised DEIR APP E29 Waste Assessment 5.5.2.

<sup>30</sup> See Union of Concerned Scientists, Nuclear Power, Safer Storage of Spent Nuclear Fuel, at [http://www.ucsusa.org/nuclear\\_power/nuclear\\_power\\_risk/safety/safer-storage-of-spent-fuel.html](http://www.ucsusa.org/nuclear_power/nuclear_power_risk/safety/safer-storage-of-spent-fuel.html) (last accessed 8 July 2011).

<sup>31</sup> Robert Alvarez, *Spent Nuclear Fuel Pools in the U.S.: Reducing the Deadly Risks of Storage*, Institute for Policy Studies (May 2011), available at [http://www.ipsdc.org/reports/spent\\_nuclear\\_fuel\\_pools\\_in\\_the\\_us\\_reducing\\_the\\_deadly\\_risks\\_of\\_storage](http://www.ipsdc.org/reports/spent_nuclear_fuel_pools_in_the_us_reducing_the_deadly_risks_of_storage) [last accessed 21 July 2011].

<sup>32</sup> E.g., Hiroko Tabuchi et al, “Spent Fuel Hampers Efforts at Japanese Nuclear Plant,” N.Y. Times (March 23, 2011) at A14.

<sup>33</sup> *Update 2 –Areva Sees U.S. Nuclear Waste Recycling Planning by ’15*, REUTERS AFRICA (June 6, 2011).

capacity.<sup>34</sup>

The response to this issue when raised at the Final Draft Environmental Impact Report stage was, "The impacts of handling and storage of radioactive waste is a matter that is firmly within the ambit of the NNR and the newly established National Radioactive Waste Disposal Institute."<sup>35</sup> However, the EIA Regulations clearly list the "construction of facilities or infrastructure for . . . the **storage and disposal of nuclear fuels**" as an activity requiring an EIA<sup>36</sup> and thus also within the ambit of NEMA. The response goes on merely to repeat that no solution has been found for long-term storage of high level waste and that it will be stored indefinitely onsite, unresponsive to any of the issues above.

It is further submitted that just as it is impossible for the applicant to assess socio-economic and worst-case impacts in the absence of a final design,<sup>37</sup> it is also impossible to assess waste impacts in the absence of one. The impacts of radioactive waste will vary depending on the composition of the waste, which depends on the type of fuel used and burnup rate, which in turn depend on the reactor design. The cursory categorisation of potential waste impacts (such as contamination of water) as "low," "medium," or "high," without any explanation as to how it may affect the environment, public health, and agriculture, is unlawful but also unsurprising given that the composition of the waste is unknown.

### **Response 6:**

#### Cumulative impacts of nuclear waste

The Revised Draft EIR indicates that both Low-Level Waste (LLW) and Intermediate-Level Waste (ILW) would be disposed at the Vaalputs nuclear waste disposal site and that there is more than sufficient capacity to accept these wastes from a power station of the capacity of Nuclear-1. Thus, from a cumulative impact perspective, there would be no cumulative implications for Nuclear-1.

In terms of the storage of on-site storage of High-Level Waste (HLW), the physical separation of the Nuclear-1 power station from Koeberg Nuclear Power Station (KNPS) and the secure design of the storage facilities would ensure that there is no cumulative radiological impact. Cumulative impact is determined by the effective radiological dose to the environment, not by the number of power stations.

The current public dose limit (1 mSv per annum) is a legal limit applied internationally for the protection of human health from exposure to ionizing radiation. This is regulated in South Africa by Regulation 388 of April 2006. Also included in this Regulation is the concept of a dose constraint. Internationally the dose constraint (not a limit) varies between 0.1 and 0.3 mSv per annum. In South Africa it is 0.25 mSv per annum, although the dose constraint could be changed to a higher constraint as part of negotiations between the operator and NNR, at least in principle. Its application is such that a constraint of say 0.25 would be imposed on the KNPS, with a constraint of 0.25 for the next nuclear power station, and 0.25 for the next. In this way in principle up to four nuclear power stations in the area can be established, each with a constraint of 0.25, but the limit of all contributors will still be below 1 mSv per annum. Thus the effective cumulative radiological impact would remain the same as for the KNPS.

Furthermore, effective radiation as a result of the cumulative storage of greater volumes of spent fuel in spent fuel pools does not increase. The water in the spent fuel pool acts as a shield, even though the inventory of spent fuel elements increases the effective dose does not increase. There are effective controls to ensure that the radiation dose stays within the limits. Therefore environmental radiation levels do not increase as greater volumes of spent fuel are stored on site.

#### Assessment of nuclear waste impacts

The Nuclear Waste Assessment (Appendix E29 of the Revised Draft EIR) goes to some length to describe the built-in controls that are applied to mitigate the impacts of nuclear waste, including the ways in which LLW is contained in sealed metal drums, the encapsulation of ILW in concrete drums and the wet and dry storage mechanisms for spent fuel (High-level Waste). Given these controls, it is reasonable to come to the conclusion that the environmental impacts of the management of these wastes will be limited.

---

<sup>34</sup> Nuclear Waste, NECSA, at <http://www.necsa.co.za/Necsa/Nuclear-Technology/Nuclear-Waste-442.aspx> [last accessed 21 July 2011].

<sup>35</sup> Revised DEIR, APP IRR 45a Long Submission ELA Final, at 8.

<sup>36</sup> EIA Regulations 2010, GNR 543 GG 33306 of 18 June 2010, Listing Notice 2, Appendix 1.

<sup>37</sup> See discussion *supra* p. 4.

The meanings of the various impact assessment criteria are explained in Chapter 7 of the Revised Draft EIR.

#### Economic consequences of nuclear waste management

Section 3.2.1.3.5 of the Economic Impact Assessment indicates the costs associated with the transport of waste from the proposed alternative Nuclear-1 sites to the Vaalputs nuclear waste disposal site.

#### Economic consequences and burden on future generations

As explained by Eskom during public participation meetings for the Nuclear-1 EIA, the cost of high-level waste storage on site is considered to form part of the operational costs of the power station.

Your comment regarding the consequences of nuclear waste management extending to future generations refers. It is indeed true that nuclear waste endures and has to be managed by future generations. However, intergenerational impacts are not unique to nuclear waste and are intrinsic to all forms of waste disposal. All forms of waste disposal, including general waste disposal, is in fact a form of long-term storage. The waste never disappears, it is simply stored indefinitely. Even conventional waste sites are characterised by long-term environmental issues such as methane production and leachate management, which need to be managed by future generations. Thus, intergenerational impacts are not unique to nuclear projects and the fact that intergenerational impacts are involved in nuclear generation does not imply that other forms of generation are free of these impacts or that they provide a risk-free alternative to nuclear. In conclusion, the fact that nuclear electricity generation can result in inter-generational impacts is not an effective argument for nuclear generation to be prohibited, as it would imply that many other commonplace human endeavours (all of which produce waste and therefore also impose burdens on future generations) also need to be rejected.

A more important consideration than whether intergenerational impacts are caused is whether these impacts can be responsibly managed. International and South African experience with management of nuclear waste suggests that it can be responsibly managed without long-term detrimental effects. It is interesting to note that commonplace open sources of radioactivity such as gold mine dumps around Johannesburg are generally accepted as a part of the landscape but that radioactivity contained within purpose-designed shielded structures and disposal of nuclear waste in properly designed containers in a purpose-designed facility at Vaalputs is questioned.

#### Overheating of spent fuel rods

It is an international practice that the spent fuel from the reactor core is in the spent fuel pool filled with water for periods up to 15 to 20 years or up to full capacity of the spent fuel racks before it is transferred into the metal or concrete casks. Spent fuel pools are designed to internationally accepted standards to ensure safety of public, workers and environment, and in line with the principle of defence-in-depth, they have multiple redundant protective barriers to ensure that failure of one barrier does not result in undue radiation exposure of the public. They are operated by trained personnel according to approved procedures. In an unlikely event of an incident, safety analysis studies prove that no member of the public, workers or environment will be exposed to undue risk (which is more than what is internationally accepted).

Parameters that are critical to nuclear safety are monitored on a regular basis and the safety functions are also tested regularly. Some of the critical parameters that are monitored include boron concentration, the temperature and the water levels of the spent fuel pools.

#### Ability to assess waste impacts in the absence of a detailed design

The forms of nuclear waste that are generated, its potential impacts on human health and the environment and mitigation and management measures to control and avoid such impacts are well known and are not dependent on a detailed design. As such, the Nuclear Waste Assessment (Appendix E29 of the Revised Draft EIR) provides a sufficient assessment of the impacts on nuclear waste generation and management.

#### **Comment 7:**

- 5. Failure to adequately assess project alternatives and a no-go option violates NEMA and the EIA Regulations, read together with PAJA 6(2)(b), and places false information in front of the decision maker (sic) in violation of PAJA 6(2)(e)(iii).**

Regulation 31 of the EIA Regulations requires an assessment and comparison of potential alternatives

to the proposed activity.<sup>38</sup> “Alternatives” is defined in the Regulations as “different means of meeting the general purpose and requirements of the activity, which may include alternatives to the type of activity to be undertaken and the option of not implementing the activity.”<sup>39</sup> NEMA s 24 also requires every application for an environmental authorisation to include an investigation of alternatives to the activity, including the option of not implementing the activity.<sup>40</sup> The duty of the applicant is to submit “all information necessary for the competent authority to consider the application and reach a decision,”<sup>41</sup> and the duty of the decision maker (sic) is to then choose the “best practicable environmental option,”<sup>42</sup> the one that “provides the most benefit or causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term.”<sup>43</sup>

Guidelines from the U.S. Nuclear Regulatory Commission (NRC) prove helpful in interpreting what it means to assess alternatives and the option of not implementing the activity (no-go option). NRC guidance calls for investigating alternatives to meet the energy demand that do not require building new capacity, such as purchasing from another utility or initiating energy conservation measures that would avoid the need for the plant.<sup>44</sup> It also calls for consideration of several other energy sources, including wind, geothermal, hydropower, and solar, even if they are considered non-competitive options.<sup>45</sup>

The Revised DEIR has not adequately assessed project alternatives and the no-go option. The EIR simply lists some energy sources in a table,<sup>46</sup> without any analysis of their impacts or the significance of those impacts, and cites the lack of base load capacity as justification for not evaluating other energy sources. Missing from Eskom’s analysis is an investigation of ways to meet energy demand without generating new capacity or ways to generate the shortfall from other sources. In other words a true comparison of the various alternatives. With regard to the no-go option, the EIR simply states that the no-go alternative is not a feasible or realistic alternative,<sup>47</sup> despite the fact that the government included a no-nuclear scenario in the IRP2 that is cost-effective and provides security of supply.<sup>48</sup>

The report’s conclusions about project alternatives and the no-go option not only violate substantive requirements to assess them under NEMA and the EIA Regulations but are also inaccurate. The finalised Integrated Resource Plan (IRP2) included no-nuclear scenarios that are cost-effective and provide security of supply.<sup>49</sup> Thus, the IRP2 shows that base load is not an issue in pursuing a nuclear-free energy plan. In addition, the IRP2 stated that after taking into account the fact that new energy technology costs would decrease over time and that nuclear would be 40% more expensive than originally projected, the cost-optimal output from the model did not include nuclear at all.<sup>50</sup> Thus, not only is a no-nuclear scenario feasible and secure, it is actually the most cost-effective option.

The applicant has not only failed to assess project alternatives and a no-go option, but has inaccurately concluded that alternatives and a no-go option are simply not viable. In addition to violating substantive provisions of NEMA and the EIA Regulations, the applicant here has put irrelevant information in front of the decision maker (sic) in violation of PAJA 6(2)(e)(iii), and any decision taken on the basis of such information will be unlawful.

---

<sup>38</sup> EIA Regulations 2010, GNR 543 GG 33306 of 18 June 2010, Chapter 3, s 31, subsec 2(g), (i).

<sup>39</sup> EIA Regulations 2010, GNR 543 GG 33306 of 18 June 2010, Chapter 1, s 1, subsec 1.

<sup>40</sup> NEMA s 24(4)(b)(i).

<sup>41</sup> EIA Regulations 2010, GNR 543 GG 33306 of 18 June 2010, Chapter 3, s 31, subsec 2.

<sup>42</sup> NEMA s 2(4)(b).

<sup>43</sup> NEMA s 1 (definition of “best practicable environmental option”).

<sup>44</sup> See Environmental Protection Agency, Office of Enforcement and Compliance, EPA Publication 315-X-08-001, § 309 Reviewers Guidance for New Nuclear Power Plant Environmental Impact Statements (Sept. 2008) at 14.1.1, 14.1.2, available at <http://epa.gov/compliance/resources/policies/nepa/309-reviewers-guidance-for-new-nuclear-power-plant-EISs-pg.pdf> (last accessed 18 June 2011).

<sup>45</sup> *Id.*

<sup>46</sup> Revised DEIR, Chapter 5, Project Alternatives, 5.3.1 Nuclear Generation Alternatives.

<sup>47</sup> Revised DEIR, Chapter 9, Impact Analysis, 9.33.12.

<sup>48</sup> Integrated Resource Plan for Electricity 2010–2030, GNR 400 GG 34263 of 6 May 2011, at 38–45.

<sup>49</sup> Integrated Resource Plan for Electricity 2010–2030, GNR 400 GG 34263 of 6 May 2011, at p. 18, 6.9.1, 6.9.4 (“If new renewable generation capacities should fail to reach their forecast performance in terms of full-load hours, this will increase total costs. It will, however, not affect other dimensions like security of supply, since solar PV is completely backed up with conventional, dispatchable generation and wind power is backed up to a large extent.”); *id.* at p. 39, B.30.

<sup>50</sup> See Integrated Resource Plan for Electricity 2010–2030, GNR 400 GG 34263 of 6 May 2011, at 38–39, paras. B.23, B.25, B.27, B.30.

Further, the report suggests that Eskom has usurped the role of the decision maker (sic), deciding for itself which option is best and that the no-go option is not a viable one. Removing options from consideration also precludes the decision maker (sic) from choosing the best practicable environmental option as required by NEMA.

When this issue was raised at the Final Draft Environmental Impact Report stage, applicant asserted that the IRP2, which chose to commit to 9600MW of nuclear, obviates any need to investigate alternative forms of power generation and the no-go option in the EIR because it has already established the optimal energy mix.<sup>51</sup> However, such rigid adherence to policy in making an administrative decision fetters the decision maker's (sic) discretion in violation of PAJA. While policies in keeping with the empowering legislation may be used to assist decision making (sic), they may not inevitably determine the outcome of the decision, lest they "preclude the person exercising the discretion from bringing his mind to bear in a real sense on the particular circumstances of each and every individual case coming up for decision."<sup>52</sup>

The IRP2 includes feasible no-nuclear scenarios<sup>53</sup> that are cost effective and provide security of supply, showing that the decision to pursue nuclear energy is not an inevitability but a policy decision. The applicant, however, falsely asserts that the no-go option is not viable and attempts to hide behind policy (the IRP2) to bypass the statutory requirements of NEMA.

### **Response 7:**

Your comments are noted.

We reiterate our response that the environmental application for Nuclear-1 is for a nuclear power station, as has been the case with other power stations such as the gas-fired power stations that have been constructed at Mossel Bay and Atlantis and the Medupi and Kusile coal fired power stations currently under construction. In all these previous instances, the scope of the EIA was restricted to a specific power station on a specific site or sites within a defined geographical area. It cannot reasonably be expected that each application for a power station must revisit strategic government decisions that have been taken on the mix of generation technologies that are necessary to meet South Africa's electricity needs. This is especially the case in the instance of the Nuclear-1 application, where the government has, through a consultative process, already taken a decision on the mix of generation technologies required to supply South Africa's future electricity needs for the next two decades. The conclusion of the IRP process, as you have stated, is that nuclear technology must form a part of the mix generation technologies. The EIA process, which is a project-specific environmental management tool, does not have any mandate to revisit the strategic analysis of power generation alternatives that was completed in the IRP.

It is indeed true that the IRP II included a scenario excluding nuclear generation, since several different alternatives of different generation mixes were considered. However, the fact the "no-nuclear" options was considered does not imply that this scenario is the most feasible or desirable alternative. It was simply one of a number of scenarios considered. The recommended option of the three considered in the IRP was to commit to a fleet of nuclear power stations. As indicated in the IRP, "*This should provide acceptable assurance of security of supply in the event of a peak oil-type increase in fuel prices and ensure that sufficient dispatchable base-load capacity is constructed to meet demand in peak hours each year*". Therefore, the IRP's conclusion, in the interests of security of supply, is that a no-nuclear scenario is not desirable.

The EIA process, which is a project-specific environmental management tool, does not have a mandate, neither is it equipped to revisit the strategic analysis of power generation alternatives that was completed in the IRP.

It must also be borne in mind that Nuclear-1 will generate a maximum of 4,000 MW of the 40,000 MW of new generating capacity that needs to be developed by 2025 and that the Integrated Resource Plan (IRP) II identifies the need for 9,600 MW of nuclear generation, whilst requiring the development of 18,000 MW of renewable energy. Thus, the development of nuclear generation is not being undertaken to the detriment or to the exclusion of renewable electricity generation.

---

<sup>51</sup> Revised DEIR, APP IRR 45a Long Submission ELA Final, at 19–20.

<sup>52</sup> *Richardson v Administrator, Transvaal* 1957 (1) SA 521 (T) at 530.

<sup>53</sup> Integrated Resource Plan for Electricity 2010–2030, GNR 400 GG 34263 of 6 May 2011, at 38–45.

Lastly, to expect the Environmental Assessment Practitioner to undertake a detailed analysis of the environmental merits of various electricity generation technologies would require not only the overturning of the administrative decision that the DEA has taken to approve the Nuclear-1 Scoping Report (and the alternatives that were proposed to be assessed), but would also require a full life-cycle assessment of the various generation alternatives – something which an EIA as a project-specific environmental management tool is not equipped to do.

**Comment 8:**

**6. General failure to place relevant considerations in front of the decision maker violates PAJA 6(2)(e)(iii).**

Failures to assess socio-economic impacts, worst-case scenario impacts, waste impacts, a no-go option, and project alternatives, in addition to violating substantive provisions of NEMA and the EIA Regulations, also amount to withholding relevant information from the decision maker (sic) in violation of PAJA 6(2)(e)(iii).

Because of NEMA's repeated emphasis on the integrated nature of environmental management, the socio-economic impacts of the NPS (most notably the impact on electricity prices and the economic fallout from a disaster) is relevant information that must be brought before a decision maker (sic). Because NEMA places such a high premium on minimisation of impacts and investigation of mitigation, a worst-case scenario analysis is also clearly relevant information, as it will bring to light the full extent of potential impacts and all possible safety measures.<sup>54</sup> Because of NEMA's life cycle and intergenerational provisions, waste impacts are also relevant. Assessment of project alternatives and a no-go option are relevant because NEMA and the EIA Regulations have specified them as such.<sup>55</sup> Any approval made without such information will be one in which relevant factors were not considered.

**Response 8:**

Your comments relating to the preceding points are noted. Our responses to these issues are included in Responses 1 to 7.

**Comment 9:**

**7. Approving the NPS in the absence of a long-term solution to the problem of high level nuclear waste is unlawful.**

This EIR acknowledges that no long term solution currently exists for the disposal of high level nuclear waste.<sup>56</sup> Storage of high level waste in spent fuel pools, which the applicant proposes to do, is only an interim solution<sup>57</sup> and one whose safety has been questioned in the aftermath of the Fukushima disaster. The Waste Assessment makes no projection of the costs of this interim storage or any mention of research and development that will be invested in finding a solution.

Approving such a project will violate NEMA's life cycle<sup>58</sup> and intergenerational provisions.<sup>59</sup> Without knowing the project's full life cycle consequences or the costs of long-term waste storage, the decision maker (sic) will be unable to determine whether the applicant is able to bear responsibility for the project throughout its life cycle (because it is unknown) and whether the project will pose an undue burden on future generations.

Approval will also violate international standards, which state that no "undue burden" be placed on future generations<sup>60</sup> and every country should have a national policy and strategy in place for the management of radioactive waste.<sup>61</sup> While the Revised DEIR refers to the National Radioactive Management Policy and Strategy of 2005 and the National Radioactive Waste Disposal Institute Act of

<sup>54</sup> See *supra* Section (b)(ii) at p. 13–15 & n. 30.

<sup>55</sup> NEMA s 24(b)(ii); EIA Regulation 31(g), 1 (definition of "alternatives").

<sup>56</sup> Revised DEIR, Chapter 9, Impact Analysis, 9.29.6; Revised DEIR APP E29 Waste Assessment, 2.2.10.

<sup>57</sup> National Radioactive Waste Management Policy and Strategy (2005) at 13.1.

<sup>58</sup> NEMA s 2(4)(e).

<sup>59</sup> NEMA s 1 (definition of "sustainable development").

<sup>60</sup> International Atomic Energy Agency, *Policies and Strategies for Radioactive Waste Management*, Chapter 4, Principles for Establishing a Policy and Strategy, at 8 (2009).

<sup>61</sup> International Atomic Energy Agency, *Policies and Strategies for Radioactive Waste Management*, Chapter 1, Introduction, at 3 (2009).



2008, such policies do not meet international best practice as they do not identify the ultimate disposal end point for high level waste.<sup>62</sup> The National Radioactive Management Policy and Strategy does not identify an ultimate disposal end point, merely stating that “Government shall ensure that investigations are conducted within set timeframes to consider the various options for safe management of used fuel and high level radioactive wastes in South Africa.”<sup>63</sup> The National Radioactive Waste Disposal Institute Act also does not provide a long-term solution; its purpose is limited to establishing an agency to manage radioactive waste,<sup>64</sup> which the Revised DEIR acknowledges has not yet been formally constituted.<sup>65</sup>

### **Response 9:**

Your comments are noted.

Internationally, with a few exceptions such as the emerging development of geological storage, long-term storage of spent fuel on the site of the nuclear power station is accepted as a safe practice and is bound by strict controls that prevent radiation from escaping into the environment. This practice has been shown to be safe in the more than 20 years of operation of the KNPS. Your opinion that failure to identify an alternative long-term disposal solution is unlawful would imply that all international experience with the on-site storage of storage of spent fuel is also illegal.

Your comment on the questions that have arisen around interim storage of spent fuel in fuel pools on site after the Fukushima Daiichi incident refers. One of the major differences between the design of the Fukushima Daiichi power station and later power stations in terms of spent fuel storage is that the Fukushima design includes the spent fuel pool in the containment structure, whereas in later designs (e.g. at Koeberg Nuclear Power Station), the spent fuel pool is separate from the containment structure and contamination in the containment structure does not impact access to, and operation of, spent fuel cooling systems. Several other major differences in nuclear power station design and operation have been implemented in the decades since Fukushima was built and the lessons from Fukushima are being incorporated into new nuclear power station designs.

Your comment regarding life-cycle and inter-generational impacts refers. Please refer to our Response 6 in this respect. We repeat that the purpose of a EIA process is not to investigate the full life-cycle impacts of the proposed project. Nevertheless, it is untrue to say that the life cycle impacts of nuclear electricity generation are unknown, since nuclear electricity generation has been practiced for several decades both South African and there is extensive international experience of the management of long-term on-site storage of high level waste.

Your comments regarding the National Radioactive Management Policy and Strategy of 2005 and the National Radioactive Waste Disposal Institute Act of 2008 are noted.

The absence of the identification of a final destination for High-Level Waste (HLW) refers. You seem to infer no HLW should be produced until such time as a long-term strategy is in place, in spite of the fact that long-term storage on site is regarded to be a safe method of long-term storage. A parallel can be drawn with strategies for the disposal of other forms of waste. Prior to 2011, with the publication of South Africa’s National Waste Management Strategy, no formal national strategy was in place to provide for responsible waste management. Currently, several of the larger general and hazardous waste disposal sites are reaching the end of their operational lives, and no guaranteed solution has yet been found for their expansion or for the creation of new disposal sites, although it is assumed that solutions to these problems have to be found in future. As indicated in Response 6, management of these wastes is just as unsustainable as the management of nuclear waste, in that the waste never disappears – it is simply stored indefinitely. In spite of the vacuum in waste management strategy prior to 2011, there was never a suggestion that South Africa should simply suspend the generation of general or hazardous waste until this strategy was in place. However, as far as nuclear waste is concerned, you have insisted that a final solution needs to be found before society can accept the risks associated with the storage of this waste. This is in spite of proven safe storage mechanisms that exist for long-term on-site storage of nuclear waste.

---

<sup>62</sup> International Atomic Energy Agency, *Policies and Strategies for Radioactive Waste Management*, Chapter 11, Strategy Formulation and Implementation, at 41 (2009) (“If long term storage is considered within the strategy, the ultimate intended disposal end point should nevertheless be indicated.”).

<sup>63</sup> Radioactive Waste Management Policy and Strategy for the Republic of South Africa, Department of Minerals and Energy, at 13.1 (2005).

<sup>64</sup> National Radioactive Waste Disposal Institute Act 53 of 2008.

<sup>65</sup> Revised DEIR, Chapter 9, Impact Analysis, 9.29.6.

## Comment 10:

### **8. Approving the NPS in the absence of a final project design is unlawful.**

Eskom has chosen to conduct an EIA before settling on a plant type and admits that “detailed descriptions of the proposed plant are not available.”<sup>66</sup> Thus, it has decided to assess a generic nuclear power station design for the EIA process,<sup>67</sup> using an “envelope” of data that includes the “highest possible values for various aspects for a range of different nuclear technology vendors,”<sup>68</sup> including Generation III reactors.

While the EIA regulations do not explicitly require a project design as part of the application,<sup>69</sup> one is necessary in order to meaningfully fulfill (sic) its requirements. Without one, it is impossible to specifically and accurately assess the impacts the development will have on the surrounding environment. Absence of a final design precludes a proper impact assessment of not only socio-economic, worst-case, and waste impacts but of all impacts. Mitigation and safety measures, in turn, are also vague and based on inadequate information. Further, a meaningful choice cannot be made between the three proposed sites on the basis of such scanty information.

The pointlessness of conducting an EIA without first deciding on a project design is evident from the superficial treatment given to potential impacts and mitigation measures throughout the Revised DEIR.<sup>70</sup> Even where proposed measures are more detailed, such as the emergency planning zones (EPZs),<sup>71</sup> without a final design it is unclear how such measures were determined and whether they are justifiable. An EIR of such scanty analysis amounts to a failure to assess impacts and investigate mitigation measures as required by the EIA Regulations and NEMA.

In addition, such an inadequate EIR will constitute a grand failure to place relevant factors in front of the decisionmaker (sic). If the regulator does not get specific, meaningful analysis on the potential impacts of the NPS in each proposed site, he or she will be unable to choose the right site or proper levels of mitigation. Any authorisation based on this EIR will be an unlawful one, as none of the factors identified as relevant under NEMA and the EIA Regulations have been properly assessed. Insofar as the lack of a project design precludes adequate assessment of impacts and mitigation measures, conducting an EIA before choosing a design is premature.

## Response 10:

Your opinion is noted.

It is common practice in EIA processes, especially for installation of industrial plants, to consider the performance of the systems and type of technology proposed to be installed, without referring to specific suppliers or manufacturers of this technology, of which there may be a range available in the market. As long as the inputs and outputs of the proposed technology are known, it is not necessary to know the brand name of the technology. In similar vein, the Nuclear-1 application is based on a number of different designs from different potential vendors. Thus, whilst it is true that the specific vendor and design for Nuclear-1 has not been identified, the Nuclear-1 Consistent Dataset (Appendix

---

<sup>66</sup> Revised DEIR, Chapter 3, Project Description 3.5.

<sup>67</sup> *Id.*

<sup>68</sup> Revised DEIR, Chapter 9, Impact Analysis, Assumptions 9.2.2.

<sup>69</sup> Compare UK regulations, which require environmental statements to contain “a description of the development comprising information on the site, **design**, and size of the development.” Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999, Regulation 2(1) (definition of “environmental statement”) & Schedule 4, Part II (1) (emphasis added).

<sup>70</sup> See, e.g., Revised DEIR, Chapter 9, Impact Analysis, Impacts on Flora and Ecosystem Functioning, Duynefontein, 9.10.1(a) (“the primary dunes **may** be impacted, **depending on what coastal setback is created**”) (emphasis added); Revised DEIR, APP E29, Waste Assessment, 8.2, 8.3, 8.4, Table 8-1 (superficial assessment of the impacts of radioactive waste, without any explanation as to how it came to its conclusions); Revised DEIR, Chapter 9, Impact Analysis, Impacts of Nuclear and non-nuclear waste, Mitigation 9.29.7 (“high level waste management system must be designed to safely manage and hold all high level waste and spent fuel”); Revised DEIR, Chapter 9, Impact Analysis, Impacts on Terrestrial Vertebrate Fauna, Mitigation, 9.13.5 (“reduce number of roads and tracks and place them carefully”).

<sup>71</sup> Eskom has proposed emergency planning zones of 800m and 3km, based on little more than an assertion that Generation III nuclear reactors possess enhanced safety features despite the fact that they are just beginning to enter the market and do not yet have a proven track record. See Revised DEIR Chapter 9, Impact Analysis, Limitations 9.2.1 & Emergency Response 9.23.

C of the Revised Draft EIR) identifies the inputs and outputs of the proposed power station from a “basket” of commercially available Generation III nuclear power stations.

It may be appropriate to explain the envelope of criteria in colloquial terms, as has been done in public meetings during the Nuclear-1 EIA process. If the envelope of criteria is compared to the specifications for buying a vehicle, this envelope may contain requirements with respect to top speed, fuel efficiency, type of tyres and wheels, fuel tank size, CO<sub>2</sub> emission limits, cruise control, numbers and positions of airbags and a number of other safety systems such as ABS and EBS. The only thing that isn’t specified is the brand of vehicle. Providing such a list of criteria would ensure that only a luxury vehicle with certain characteristics could qualify, but that a base model (entry-level vehicle) would not qualify. Similarly, if a vendor proposes a power station design that fails to comply with the criteria established in the Consistent Dataset, that design will not qualify for consideration.

Furthermore, nuclear power generation technology has been in use for several decades, and more specifically with respect to the proposed Nuclear-1 power station, Pressurised Water Reactors (PWRs) are in common use internationally and the experience with the operation of the KNPS is available in South Africa. Nuclear-1 EIA specialists have referred to the KNPS experience, including information from the monitoring of its environmental impacts that has been collected in the more than two decades of its operation. With reference to these examples, it is certainly possible on a generic level to predict the impacts of a nuclear power station and on a project-specific level to predict the environmental impacts of a proposed nuclear power station with an output of 4,000 MW.

Your statement that it is impossible to make a meaningful choice between the three proposed sites based on the available information refers. The choice between sites is dictated to a greater extent by the characteristics and sensitivity of the sites than by the specifics of the nuclear technology. Detailed assessments of the site conditions have been undertaken and therefore it is certainly possible to determine the environmental sensitivity of the different sites and to identify specific areas within each site that are suitable or unsuitable for construction of a nuclear power station.

#### **Comment 11:**

##### **9. The Thyspunt site is not a viable one for the Nuclear-1 project.**

The Revised DEIR identifies Thyspunt as the preferred site for Nuclear-1,<sup>72</sup> despite the fact that the Heritage Impact Assessment concluded that Thyspunt has exceptional archaeological, palaeontological, and wilderness value<sup>73</sup> and presents excessive difficulties for mitigation<sup>74</sup> and that the South African Heritage Resource Agency has unconditionally recommended that Thyspunt is not a suitable site for development.<sup>75</sup> Dr. Binnerman, an archaeological expert states that, “The archaeology of the coastal zone (5 km inland from the coast) is well-known and has been investigated in some detail by the author in the past. Heritage practitioners also conducted surveys along the adjacent coast for the proposed Eskom Nuclear Power Station at Thyspunt. These studies indicate that the coastal zone from the Klasies River in the west to the Krom River in the east is one of the richest and most important archaeological cultural landscapes in South Africa.”<sup>76</sup>

The Heritage Assessment repeatedly emphasizes the impossibility of constructing Nuclear-1 without extensive, irreversible (sic) impacts on heritage at Thyspunt.<sup>77</sup> Yet the EIA largely ignores this, recommending that Thyspunt be the preferred site. Despite the Heritage Assessment’s unequivocal warnings that mitigation at Thyspunt is highly infeasible,<sup>78</sup> the Revised DEIR has included a “Heritage Mitigation Study” proposing a trial excavation in the Thyspunt site. The Heritage Assessment states that the archaeological preference is to preserve conservation *in-situ*, yet the EIA suggests a parallel system of construction of the nuclear station and excavation instead.<sup>79</sup>

As the projects stands currently, it may not go forward before Eskom has carried out its own proposed trial excavation to explore unknown aspects of the Thyspunt site to determine if there is an area where

---

<sup>72</sup> Revised DEIR, Executive Summary.

<sup>73</sup> Revised DEIR, APP E20, Heritage Impact Assessment 4.3.

<sup>74</sup> Revised DEIR, APP E20, Heritage Impact Assessment 4.3; 5.1.3; 5.2.2 (c).

<sup>75</sup> Revised DEIR, APP E20, Heritage Mitigation Study, Introduction 1.

<sup>76</sup> Dr. Johan Binnerman, An Archaeological Desktop Study for the Construction of the Proposed Tsitsikamma Community Wind Energy Facility, Kouga Local Municipality, Humansdorp District, Eastern Cape Province (March 2011).

<sup>77</sup> Revised DEIR, APP E20, Heritage Impact Assessment 3.1.1; 3.2.9; 3.2.10; 5.1.3.

<sup>78</sup> Revised DEIR, APP E20, Heritage Impact Assessment 4.3; 5.1.3; 5.2.2 (c).

<sup>79</sup> Revised DEIR, APP E20, Heritage Impact Assessment 5.1.2; Heritage Mitigation Study 1.1.1.

the development footprint will result in fewer impacts. However, the suitability of Thyspunt as a site for Nuclear-1 will not change whether something is found in the trial excavation or not because the value of Thyspunt lies in both its cultural heritage and high biodiversity – even if the NPS is built in an area of relatively fewer archaeological sites, it will still destroy the landscape and wilderness qualities of the area.<sup>80</sup> Further, cultural heritage as understood under the NHRA is not limited to artifacts and other physical vestiges of human society; rather, it is a holistic concept, encompassing all the relationships that existed within a certain geographical area.<sup>81</sup> As the HIA states, "The landscape, together with the archaeological sites it contains may be viewed as a single holistic entity, which retains the spatial patterning of human use of the landscape in a largely intact natural coastal environment that has not changed significantly since prehistoric times."<sup>82</sup> Thus, any approval of the project will be an unlawful administrative decision in violation of the National Heritage Resources Act s 5, NEMA s 2(4)(a)(iii) and PAJA s 6(2)(e)(iii) & (h).

A project approval at Thyspunt would also violate international law. Given that the Thyspunt site qualifies as a "cultural landscape" under the UNESCO World Heritage Convention, the state now has an obligation, under Article 4 of the treaty, to ensure "the identification, protection, conservation, presentation and transmission to future generations of the cultural and natural heritage referred to in Articles 1 and 2 to the utmost of its own resources and, where appropriate, with any international assistance and co-operation, in particular, financial, artistic, scientific and technical, which it may be able to obtain." Article 5 also require each State party to "take the appropriate legal, scientific, technical, administrative and financial measures necessary for the identification, protection, conservation, presentation and rehabilitation of this heritage."

In addition to violating several statutes, pursuing the Thyspunt site also presents practical difficulties. The rich palaeontological and archaeological record at Thyspunt would require a large-scale scientific dig over the period of decades, far longer than during the proposed construction of the nuclear power station. A similar scope would be Klasiess Rivers Mouth, which has been under continuous archaeological examination since 1960.<sup>83</sup>

### **Response 11:**

At the time of the release of the Revised Draft EIR and the Heritage Impact Assessment (Appendix E20 of the Revised Draft EIR) for comment there was uncertainty about the occurrence of additional archaeological sites within this central area of vegetated dunes. However, in the time since the Revised Draft EIR was released for public comment, the additional test excavations have been conducted at the Thyspunt site. These excavations were done under authority of SAHRA through a permit for test excavation. The finding of these test excavations is as follows (from the Revised Heritage Impact Assessment, which considers the test excavation results and which will be released for public comment with the next revision of the EIR):

*"The potential for destruction of Late Stone Age middens will be particularly acute with respect to areas within 300 m of the coast and very much less acute further inland in the vegetated dune areas. The location of the facility will be a key factor in determining the extent to which impacts will occur. Any facilities placed within 200 m of the rocky shoreline or crossing the rocky shoreline will result in impacts. However, if a site were to be selected adjacent to Thysbaai beach, or within the vegetated dunes as proposed, the degree of impact will be greatly reduced as Late Stone Age middens tend to be more common adjacent to rocky shores, and in areas where there are surface water sources."* This study found that archaeological sites are concentrated close to sources of fresh water, which occur at the Thyspunt site along the coast (coastal seeps), in the mobile dune corridor in the northern portion of the site (inter-dune wetlands) and in the eastern portion of the site. The central vegetated dune portion of the site where power station has been recommended to be placed also happens to be the area where the least other environmentally sensitive features occur.

As indicated by the above quotation, the recommended position of the Nuclear-1 power station is within the vegetated dunes, which avoids the concentrations of archaeological sites in the coastal corridors. It is indeed a well-documented principle that archaeological material should, where possible,

<sup>80</sup> See Revised DEIR, APP 20, Heritage Impact Assessment 3.2.9, 3.2.10.

<sup>81</sup> See National Heritage Resources Act s 1 (definition of "living heritage"), s 3(2).

<sup>82</sup> Revised DEIR, APP 20, Heritage Impact Assessment 2.3.2(c).

<sup>83</sup> See Archaeology Case Studies, Klasies River Caves, Association of Southern African Professional Archaeologists, at [http://www.asapa.org.za/index.php/archaeology/case\\_studies/about\\_archaeology\\_klasies\\_river\\_caves/](http://www.asapa.org.za/index.php/archaeology/case_studies/about_archaeology_klasies_river_caves/) [last accessed 27 July 2011].

be conserved in situ. The findings of the test excavations confirm that the vast majority of the archaeological sites on the Thyspunt site can be conserved in-situ and that a small minority would need to be excavated.

The comments from the South African Heritage Resource Agency (SAHRA regarding the suitability of the Thyspunt site for Nuclear-1 are noted, however additional test excavations at Thyspunt that were approved by the South African Heritage Resource Agency and conducted in 2011 (after the release of the Revised Draft EIR Version 1), have confirmed that the heritage sites in the recommended footprint of the power station at Thyspunt are few in number and of low quality. This implies that direct impacts on heritage resources can be mitigated. It is important to note that no formal application has yet been lodged with SAHRA for the excavation of the site and that any statement by SAHRA in this respect is therefore premature, since not all the facts in respect of an archaeological excavation permit have been placed at SAHRA's disposal.

Your statement that development at the Thyspunt site would violate international law refers. It is an opinion expressed by the heritage specialist that this site may qualify for listing as a World Heritage Site. Whilst this is a noteworthy conclusion, the site currently has no World Heritage Status and it would need to be nominated by South Africa and accepted by UNESCO prior to such status being applied under South Africa's World Heritage Convention Act, 1999 (Act No. 49 of 1999). Thus there is no current question of violation of any international law. It cannot be deduced that the expression of the heritage specialist's opinion in this regard necessarily implies that UNESCO would share the opinion that the Thyspunt site is of universal value to humankind. An opinion about violation of international law is therefore premature.

Your opinion about the practical difficulties of mitigating the heritage impact at Thyspunt refers. In this regard it must be pointed out that the revised conclusion of the Heritage Impact Assessment (HIA), based on the trial excavations undertaken during 2011, is different from the conclusions of the HIA that was included in the Revised Draft EIR.

The revised conclusions are: "*Mitigation of any heritage material through sampling by controlled excavation, or creation of local exclusion areas is considered feasible with resources currently available. Some on site storage (a small museum) may be necessary.*"

This contrasts with the previous conclusion: "*Mitigation without excessive impacts is going to be technically difficult to achieve due to the character of the site and difficulties with respect to accessibility*".

#### **Comment 12:**

#### **Conclusion**

It is submitted that the failure to properly assess the impacts referred to above create a real risk that if the project is authorized it will infringing (sic) the environmental rights of both present and future generations. Further, the revised draft environmental impact assessment report does not place all relevant information that could materially influence the decision maker before it, and therefore a decision to authorise the construction of a nuclear power station based on this report would be open to legal challenge.<sup>84</sup>

#### **Response 12:**

Your comment is noted. Our comprehensive responses to each of the factors that contribute to your opinion are contained in the responses above.

Yours faithfully  
for GIBB (Pty) Ltd



---

The Nuclear-1 Team

<sup>84</sup> Section 6(2)(e)(iii) of PAJA Act No 3 of 2000.