

## **Comments submitted by CORE [Cumbrians Opposed to a Radioactive Environment]**

CORE submits the following comments on NuGen's DCO Stage 1 Consultation Strategic Issues Consultation. The comments – in outline only - are geared to the selected headings (below) as they appear in the consultation document and are submitted as an interim response, with a more detailed response anticipated next year when more detailed and firmed up plans are available for consultation.

### **2.1 Introduction to Cumbria and its Nuclear Heritage**

### **2.2 The Cumbria Agenda for Growth**

### **3.1 National Need for the Moorside Project**

### **3.2 The Site Designation**

### **4.2 Cumbria Benefits from the Moorside Project**

CORE's comments are followed by the recent and more detailed assessments by CORE of NuGen's plans. They include the expansion of the Moorside land area and a summary of the hurdles facing the project, its timeline in relation to reactor construction and operation and the current Westinghouse construction experience overseas. The latter clearly provides a significantly more accurate template of what awaits Moorside and West Cumbria than the consultation documents suggest

### **2.1 Introduction to Cumbria and its Nuclear Heritage**

The use of Cumbria's long tradition of the nuclear industry as a consultation testimonial for the future development of the Moorside project is misplaced and irrelevant to the need for the project. It makes the mistake of inferring that, because of this 'heritage' there will be an unbridled acceptance for any new nuclear development – as quoted earlier this year by NuGen's CEO in an interview with BBC Radio Cumbria.

In the mid 1990's a similarly mistake - of automatic public acceptance - held by the Nuclear Industry Radioactive Waste Executive (NIREX) was highlighted by the Public Inquiry Inspector (RCF Appeal 1995/96) who also considered '*it is now very evident that West Cumbria is too dependent on the nuclear industry, and so it would be an economic detriment, in my view, to significantly consolidate the nuclear industry by establishing the repository near Sellafield. Also, despite relative familiarity with the industry, there is a substantial degree of local apprehension, mainly about health and safety in relation to radioactive waste, which affects residential amenity. Similarly, there could be noteworthy effects on tourism, fisheries and inward investment in business*'. Though relating to a waste repository in this instance, CORE considers the sentiments to be equally applicable to the Moorside project.

### **2.2 The Cumbria Agenda for Growth**

As quoted by NuGen in the consultation document, the Strategic Economic Plan notes that with significant new UK nuclear investment opportunities for the private sector in the pipeline and potential for new nuclear build, the challenge is to '*use the nuclear expertise and investment as a means of diversifying and growing the local economy*'

In reality that challenge has existed since the late 1980's when diversification plans were drawn up in readiness for the lay-off of the significant workforce employed on the construction of the Thermal Oxide Reprocessing Plant (THORP). It remains unfulfilled today. This ongoing failure to diversify and attract inward investment for non-nuclear enterprises is certain to continue as long as the pro-nuclear lobby, NuGen included, continues to call for an expansion of the nuclear industry. Whether through new-build, a geological disposal facility, more reprocessing or a MOX fuel production plant at Sellafield, the threat of such an expansion will continue to act, as it has over the last two decades, as the kiss of death to economic diversification and non-nuclear investment in West Cumbria.

CORE does not subscribe to the Britain's Energy Coast view that the Moorside Project is "critical to the continued economic health of the area". That same claim, made for the Geological Disposal Facility (GDF) during the Managing Radioactive Waste Safely (MRWS) process in West Cumbria was patent scaremongering by local politicians and rejected as unsubstantiated.

### **3.1 National Need for the Moorside Project**

CORE is adamantly opposed to the Government's new-build plans and believes nuclear power has no place in either the global or domestic UK energy mix on the basis that it is neither clean, green or sustainable, is uneconomic, dependent on subsidies and will do little to mitigate carbon emissions.

Further, the UK's new-build plans are an unwarranted distraction to the development of the UK's renewables potential, particularly in West Cumbria where Cumbria Vision's 2010 report – The Scope for Renewable Energy in Cumbria (Sir Martin Holdgate) – identified the prospect of the mix of Cumbrian renewables creating, by 2050, more employment and generating more electricity than NuGen's projections for Moorside.

### **3.2 The Site Designation**

It is incomprehensible that a greenfield site that is remote from where the demand for electricity currently exists should have made the Government's new build list. Previously documented as a 'less than optimum' site because of the depth of the bedrock, direct seawater cooling via the radioactively contaminated offshore waters of the Irish Sea, the need to upgrade the grid connection and other site limitations, the proposed site faces the additional logistical problems of West Cumbria's inferior road and rail infrastructure. The current evidence on timescales points to the site's selection by Government *'as potentially suitable for generation before the end of 2025'* as being unachievable.

The original selection of the less than optimum site had little to do with its merit to host a new build project and everything to do with appeasing a worried West Cumbrian pro-nuclear lobby who feared that, without Moorside, the impending end to Sellafield's commercial operations would herald the demise of its vested interest and undemocratic nuclear aspirations for West Cumbria

### **4.2 Cumbria Benefits from the Moorside Project**

It is premature in the extreme to identify any benefit to Cumbria from the operation of Westinghouse AP1000 reactors whose construction has yet to be completed anywhere in the world and whose operational track record - for a 'first of a kind Gen III reactor - is therefore non-existent.

Conversely, the detriments of nuclear power in the UK and abroad are well documented and include radioactive discharges, environmental contamination, the unnecessary creation of nuclear wastes and volumes of spent fuel that as yet have no disposal route, health impact and the risks associated with the transport of nuclear materials and of accident and/or terrorist attack. 50 years of such detriments have resulted in the current stigmatisation of Sellafield as a nuclear blot on the landscape. The operation of new reactors at Moorside will not only inevitably aggravate that status but also bring its own adverse impact on West Cumbria and areas further afield.

Further detriments will be the wholesale disruption over a number of years to the local area during the construction of Moorside and from the upgrading of the national grid system which threatens similar disruption to the South Cumbria and North Lancashire regions.

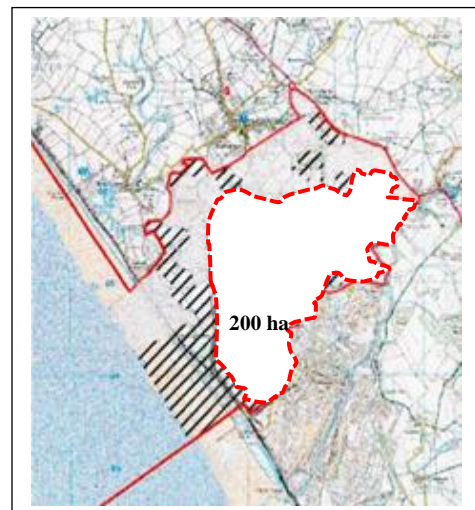
### CORE's assessment of the Moorside land area (published 19<sup>th</sup> July 2015)

Consultation documents published by NuGen on its new-build plans suggest a belated realisation by the developer that, given the topography, geology and other constraints of the Moorside site, three first of a kind AP1000 reactors, plus all the associated paraphernalia needed to construct, operate and service them, were never going to be squeezed into the land originally purchased from the NDA in 2009. It was from within this original land parcel of 200 hectares that NuGen subsequently projected that *'the most suitable 100 ha would be selected for the nuclear power station'*.

Today, however, NuGen says that *'the generating elements of the power station would cover some 200 hectares'* (EIA Scoping Report Vol 1 page 22, para 2.2.1) - the whole of the originally purchased land area and not just 100 hectares within it. The knock-on effect of this doubling of the reactor area from 100 to 200 hectares is the dramatic expansion of the overall West Cumbrian land area now required for investigation - **from 200 to 552 hectares** (EIA Scoping Report Vol 1, page 22, Para 2.2.1). The figures below show the extent of the Moorside mission creep from 200 to 552ha.



**Fig 1**



**Fig 2**

**Fig 1** shows the outline of the original 200 hectare site sold to NuGen in 2009.

**Fig 2** shows the new 552 hectare site (EIA Scoping Report, Vol 2, Fig 1.3) rebranded as the 'Moorside Search Area' and within which lies the original 200 hectare land area which is now identified as 'boundary for reactors'. The hatched areas are defined as Initial Scoping Land and the grey areas as **Additional Scoping Land**. Not shown in Fig 2 is the 2000 hectare area of the Irish Sea defined as the Indicative Marine Infrastructure Area for cooling system tunnels etc.

Creeping ever northwards and westwards to the verges of the Beckermets and Braystones villages, the (grey) Additional Scoping Land is described by NuGen as land in which *'the siting and extent of proposed temporary and permanent works have yet to be confirmed'*. These temporary works – which could become permanent - include a new rail spur with workforce railway platforms, freight sidings, Marine off-loading facility and other works.

The permanent works - outside the 'boundary for reactors' - will include an electricity sub-station, spent reactor fuel and nuclear waste stores and a visitor centre. This sprawl of temporary and permanent facilities outside the reactors' boundary are likely to ruffle more than a few local feathers, particularly among property and land owners within the Additional Scoping Land who face the prospect of having their assets compulsory purchased.

Building three AP1000 reactors on one site has never before been attempted by Westinghouse and some measure of the destructive sprawl awaiting the guinea-pig Moorside site - and its local residents - can be gauged from the photograph below, taken on 20<sup>th</sup> June 2015, of the VC Summer site in the US where just two AP1000 reactors are being built.



[Photo: SRS Watch]

The de-forested and bulldozed VC Summer site in South Carolina some 5 years after land clearance began. Reactor Units 2&3 (ringed) are at different stages of construction and some of the 300 plus modules that make up each reactor are assembled lego-style at assembly points around the site. The further sprawl receding in the background and adding considerably to the overall site size are identified as construction offices and equipment laydown and warehouse areas – all of which are likely to be located in the Moorside **Additional Scoping Land** shown in grey in **Fig 2**.

Cooling water for the VC Summer reactors will be drawn from the local Monticello Reservoir with additional cooling provided by the circular low-profile (21 metre high) cooling towers – two per reactor - on the left hand perimeter of the site.



For Moorside, NuGen has ruled out the use of large natural draught cooling towers of the type used for many existing coal fired power stations in the UK (EIA Scoping Report, Vol 1, Page 23, Para 2.2.9) and confirmed its choice of direct seawater cooling from the Irish Sea. Should additional cooling be required, the option of auxiliary cooling towers – possibly similar to those at VC Summer - is still under consideration by NuGen.

The underestimate of the extent of land required for Moorside is echoed by a similar underestimate of the four year build time claimed for each of its projected AP1000 reactors – a timeline that NuGen knows to be wholly at odds with the current Westinghouse experience overseas. The VC Summer twin reactors above, also scheduled to be built in four years, are currently in their 6<sup>th</sup> and 7<sup>th</sup> year of construction respectively and, as can be seen, still nowhere near completion or the production of electricity.

### **CORE's critique of the Moorside project plans (published 14<sup>th</sup> February 2015)**

The critique, summarised below, is entitled entitled ‘**Moorside Build & Job Projections - All Spin and No Substance**’ and headed by a Chinese quote (15/01/15) that “ *Westinghouse oversold the system, oversold the technology, promised more than they could really deliver*”. The critique can be found at <http://www.no2nuclearpower.org.uk/wp/wp-content/uploads/2015/02/Moorside-Build-and-Job-Projections..pdf>.

#### **Summary – Moorside Realities**

To meet the currently proposed investment date, there are a number of site-related, regulatory and planning issues to be resolved before a decision can be made. These include the site's less than optimum geology, the upgrading of the National Grid transmission system and the satisfactory conclusion of the Generic Design Assessment of the AP1000 reactor. All have the potential to delay the process and put back the decision date by months if not years – a setback already being experienced by other new-build developers throughout the world, including EDF's Hinkley Point C project in Somerset.

For Moorside, the investment decision date has already been put back from 2015 to 2018 and there is nothing to suggest that the latter is guaranteed. Even if met, the construction stage of the project – from 2020 or later – faces the significantly greater and ‘schedule-busting’ threat to the construction phase posed by the fabrication of over 600 modules, many weighing hundreds of tons that will make up the three reactors. As much a novelty for the UK as for Westinghouse, the sheer scale of this requirement has never before been undertaken and is wholly dependent not only on the national availability of competent fabricators but also on overcoming the significant logistical problems of module delivery posed by West Cumbria's inadequate transport infrastructure.

The target date of ‘late 2018’ for making its investment decision presents the first major milestone for NuGen in its new-build plans for Moorside. If reached, reactor construction would then start in 2020, but any slippage along the road to that investment date carries forward a similar delay to the construction schedule - optimistic by any standard and one riddled with uncertainties - that projects build completion and production of electricity from three ‘first of a kind’ AP1000 reactors within the six-year time frame 2020-2026.

**Based on current evidence and Sellafield's recent experience of module fabrication and delivery (the Evaporator D project), it is inconceivable that this untried and untested element of NuGen's project can be delivered on time. That a delay of several years is inevitable is more than supported by the chronic progress of Westinghouse AP1000 projects overseas. For without exception, the build time for all overseas projects (twin reactor projects on two sites in both the US and China) now extends to between six and seven years - and still counting - largely as a result of module fabrication and delivery problems.**

**Whilst NuGen and its partners remain in collective denial of the problems overseas, it is reasonable to predict that Moorside's reactor construction stage will be compromised to a similar or greater degree. This would see completion of reactor construction pushed back towards 2030 at best and, should the investment decision not have been made by late 2018, even further into that decade.**

**The inference to be drawn from the catalogue of uncertainties and unsubstantiated claims in NuGen's project schedule, together with the AP1000 construction experience of Westinghouse overseas as exposed in this CORE assessment, is that the Moorside project is indeed based on spin – and has no substance. Adding incontrovertible support to this inference is the recent view of a nuclear expert in China that Westinghouse had “oversold the system, oversold the technology and promised more than they could really deliver” – a damning indictment that wholly undermines the viability of NuGen's current plans.**

Should the project go ahead – to whatever timeline – a sizeable workforce will be required to build and operate the reactors. Many of the job projections published for Moorside in recent years are clearly overstated, and whilst Government, Industry and Developer collectively refuse to substantiate their own figures (14,000-21,000 jobs), a comparison with the current workforce employed on AP1000 projects overseas suggest an estimate of 5000 construction (at peak) and 900 operational jobs for three reactors. The final count is likely to include many workers transferring from Sellafield's closed-down reprocessing facilities, those provided directly by Westinghouse itself, and from West Cumbria's transient contractor workforce.

#### **About CORE.**

Cumbrians Opposed to a Radioactive Environment was formed in 1980 in Barrow-in-Furness to present local opposition to the import of foreign spent nuclear fuel, via Barrow docks, for reprocessing at Sellafield. Expanded over the years, the Group's campaign remit remains focused on Sellafield's commercial operations – reprocessing, nuclear materials stockpiles and management, nuclear waste production, environmental discharges, health detriment and the transport of nuclear materials – with work on the more recent Government's plans for new-build and the geological disposal of nuclear wastes also featuring in CORE's anti-nuclear campaign.

The submission of comments to NuGen's consultation is made on behalf of CORE's members and supporters at home and abroad.