

ORAL HEARING

PROPOSED LIQUEFIED NATURAL GAS (LNG) REGASIFICATION
TERMINAL LOCATED ON THE SOUTHERN SHORE
OF THE SHANNON ESTUARY IN THE TOWNLANDS
OF RALAPPANE AND KILCOLGAN LOWER, CO. KERRY

HEARD BEFORE THE INSPECTOR,

MR. ANDREW BOYLE

ON FRIDAY, 25TH JANUARY, 2008

AT THE BRANDON HOTEL, TRALEE, CO. KERRY - DAY 5

I hereby certify the
following to be a true
and accurate
transcript
of recordings of the
evidence in the
above-named action.

5

APPEARANCES

KERRY COUNTY COUNCIL: MR. T. SHEEHY

FOR THE APPLICANT
(SHANNON LNG): MR. HUGH O'NEILL SC
MR. JARLATH FITZSIMONS BL

INSTRUCTED BY: NICOLA DUNLEAVY
SOLICITOR
MATHESON ORMSBY PRENTICE

OBJECTORS: MR. J. McELLI GOTT
MS. GRIFFIN
MR. NOEL LYNCH
MS. JOAN MURPHY
MR. DONNCHA FINUCANE
MS. EILEEN O'CONNOR
MR. E. McELLI GOTT
MRS. LILY O' MAHONY
MR. RAYMOND O' MAHONY
MR. TIM MAHONY
MR. THOMAS O' DONOVAN
MR. MICHAEL FINUCANE
MR. RICHARD O' SULLIVAN
MR. DES BRANIGAN

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1 THE HEARING RESUMED, AS FOLLOWS, ON FRIDAY, 25TH
2 JANUARY, 2008

3
4 **INSPECTOR:** Good morning everybody.

5 This is Day 5 of the oral 10: 03
6 hearing into the Shannon LNG proposal. Yesterday we
7 were hearing from the applicants on the health and
8 safety issue and I think they have one more speaker
9 that they wish to present so I will hand over now to
10 the applicants. 10: 04

11 **MR. O'NEILL:** Good morning, sir. Perhaps
12 before I ask our next

13 witness to make this his presentation there is just a
14 housekeeping matter. The QRA and the questions and
15 answers arising from the QRA have been the subject of 10: 04
16 some debate and I think it may be appropriate if I make
17 available to you, or formally make available to you the
18 QRA and the questions and answers. I do so, obviously,
19 on the basis of not any obligation, because we are very
20 conscious and I am sure the Board is very conscious, of 10: 04
21 the fact that -- and we will be submitting that, of
22 course, the Board looks at issues of health and safety
23 but having regard to the expertise of the Board,
24 undoubted expertise of the Board and, of course, the
25 undoubted expertise of the Health and Safety Authority, 10: 04
26 that a significant amount of reliance is identified and
27 being placed by the Board on the HSA. So, I am giving
28 you the documents not on the basis that you should go
29 off and second guess them, so to speak, but in case you

1 need to refer to them, particularly in the context of
2 questions being asked. (SAME HANDED TO THE INSPECTOR)
3 **INSPECTOR:** Thank you, Mr. O'Neill. I
4 think that comes as
5 something of a relief to me. 10:05
6 **MR. O'NEILL:** If you have any difficulty
7 sleeping I am sure they
8 will assist you, sir.
9
10 My last expert in this field is Dr. Raj. Dr. Raj is an 10:05
11 expert in LNG risk assessment and the consequences of
12 spills and it is important to emphasise that he has not
13 been involved with any aspect, with one small exception
14 which Dr. Raj will refer to, in any aspect in relation
15 to the preparation of the EIS or the QRA. He has been 10:06
16 brought in as an independent person after all this
17 documentation has been prepared and presented to the
18 Board, the EIS to the Board, and the QRA to the Health
19 and Safety Authority, for the purposes of expressing
20 his independent view as to whether the criteria under 10:06
21 the various legislative provisions and the guidelines,
22 the various guidelines, have in fact been complied with
23 and, indeed, whether in his view the facility and the
24 operation of the facility constitutes a significant
25 risk. Dr. Raj please. 10:06
26
27
28
29

1 DR. PHANI RAJ PRESENTED HIS SUBMISSION, AS FOLLOWS:

2
3 DR. RAJ: Good morning,
4 Mr. Inspector. My name is
5 Phani Raj, I am the President of Technology and 10:06
6 Management Systems (TMS), Burlington, Massachusetts,
7 which is a suburb of Boston in the United States.

8
9 My company is a small consulting company specialising
10 in safety assessments. My evidence addresses liquefied 10:07
11 natural gas facilities in general and my assessment, in
12 particular, of the design, safety and other issues
13 related to the proposed Shannon LNG terminal Co. Kerry.

14
15 My testimony before you today will cover the following 10:07
16 items:

- 17
- 18 1. My educational background, work experience and
19 professional qualifications.
 - 20 2. The extent of my involvement in the project issues 10:07
21 and activities undertaken to present this testimony.
 - 22 3. Brief review of the safety of the LNG industry.
 - 23 4. Comparison of the US and European approaches
24 in siting and land use of LNG facilities.
 - 25 5. Comments on the project safety analysis and the 10:07
26 Environmental Impact Statement.
 - 27 6. Opinions on the submissions raised by third parties.
 - 28 7. Other technical issues relating to safety.
- 29

1 My education achievements includes a Bachelor's Degree
2 in Mechanical Engineer from the university of
3 Bangalore, Masters Degree in Power Engineering from the
4 Indian Institute of Science (both in India), Master in
5 Science and Ph.D. Degrees in Engineering from Harvard 10:08
6 University, (Cambridge, MA, USA) and an MBA Degree in
7 Finance from the Northeastern University in Boston. I
8 have worked as a post doctoral research fellow at
9 Harvard University, as a senior consultant at Arthur D.
10 Little, Inc of Cambridge, MA, and internationally 10:08
11 recognised consulting company, and as the President of
12 Technology and Management Systems for over 25 years.
13 By the way, Mr. Inspector, I started this company
14 Technology and Management Systems in 1981.

15 10:08
16 I come before you as a researcher in the field of LNG
17 safety with over 35 years of experience in conducting
18 experiments, analysing the test results and developing
19 mathematical models for the behaviour of LNG upon its
20 release into the environment and the hazards it may 10:09
21 pose. My research projects related to LNG have been
22 funded primarily by U.S federal government agencies
23 such as the US Coast Guard and the US Department of
24 Transportation, and to a lesser extent by the LNG
25 industry. My LNG research, including designing and to 10:09
26 conducting field tests to understand the various
27 phenomena related to the behaviour of LNG after
28 release, dates back to early 1970's. My recent
29 research, sponsored jointly by the Pipeline Hazardous

1 Material Safety Administration (PHMSA) of the US
2 Department of Transportation and Di strigas of
3 Massachusetts, LLC, has been to evaluate the data from
4 the largest LNG fire experiment to date and develop a
5 new mathematical model characterising the behaviour of 10: 10
6 very large LNG pool fires and their radiant heat
7 effects. Other research also funded by the U.S. DOT
8 that I recently concluded includes the experimental
9 determination of human tolerance (without injury) to
10 LNG fire radiant heat. I will cover this a little 10: 10
11 later, sir

12
13 In my capacity as a scientist and researcher in the
14 field of LNG behaviour modelling I have (i) provided
15 consulting support to the Government agencies, the LNG 10: 10
16 industry and standard setting bodies (ii) testified
17 before administrative and regulatory proceedings (iii)
18 presented my many scientific research findings before
19 peer groups, responded to the safety questions from the
20 public in public hearings (iv) trained firemen and 10: 10
21 first responders in the properties and behaviour of
22 LNG, and (v) authored a number of technical
23 publications in reputable journals. I also serve as a
24 full voting member of the National Fire Protection
25 Association (NFPA), Technical Committees on LNG 10: 11
26 Standards (NFPA 59A) and the LPG Standards (NFPA 58).
27 Many parts of the NFPA 59A, which has a title "Standard
28 For the Production, Storage and Handling of Liquefied
29 Gas", are recognised and used by many countries as

1 guidance for siting, design and operation of LNG
2 facilities. NFPA 59A (2001 edition) has been made part
3 of the US Department of Transportation regulations for
4 LNG through the incorporation. Recently I, as a
5 Chairman of the NFPA Sub-Committee Task Group, helped 10: 12
6 develop a chapter for the application of risk based
7 analysis for siting LNG facilities, which has been
8 voted and accepted by the full Committee for inclusion
9 in the 2008 edition of the NFPA 59A.

10
11 Mr. Inspector, I would like to say that while the 10: 12
12 Committee has voted it has one additional voting that
13 is necessary by the full members of the NFPA which will
14 take place in June and I fully expect that this will be
15 included in the 2008 edition. 10: 12

16
17 In addition to conducting research and working on LNG
18 industry safety issues, I have also evaluated safety in
19 other chemical and petrochemical industries and in the
20 transportation of hazardous materials in road trucks, 10: 12
21 rail tank cars, barges and ships. I have also
22 performed independent risk analysis calculations for
23 the LPG industry, US Federal Railroad Administration
24 (to evaluate the risk to the US population from the
25 transport of over a hundred highly hazardous chemicals 10: 13
26 on the US rail system), storage of large quantities of
27 liquid oxygen and chlorine in a military base.

28
29 I have published over 50 technical (peer reviewed

1 journal) papers and over 120 technical reports on
2 chemical and energy fluids' safety issues and
3 mathematical models to calculate the hazards. I have
4 taught in the chemical engineering department of MIT,
5 given week long seminars in Europe on LNG behaviour 10: 13
6 modeling. I have edited the proceedings of a
7 conference held at MIT on the LNF fires. My membership
8 in Committees and advisory panels include the
9 following:

- 10 10: 13
- 11 - I am a member of the Advisory Panel on LNG to the
12 Government Accountable Office (GAO) Washington DC.
 - 13 - I am the Technical Consultant to the Centre for LNG,
14 Washington DC.
 - 15 - I am a member of the American Institute of Chemical 10: 14
16 Engineers.
 - 17 - I am a member of the Technical Committee on
18 Liquefied Natural Gas (NFPA 59A), as I mentioned
19 before.
 - 20 - I am also a member of the Liquefied Petroleum Gas 10: 14
21 Standards Committee
 - 22 - I am also a member of the Committee for The Study of
23 Railroad Tank Car Design Process, Transportation
24 Research Board, which is a part of the National
25 Research Council in Washington. 10: 14
 - 26 - I was a Senior Consultant to the Nuclear Waste
27 Technical Review Board.
 - 28 - I was a member of the Committee on the
29 Transportation of Hazardous Materials (which is also

1 part of the National Research Council.

2 - I was also a member on the Editorial Board of the
3 Journal of Hazardous Materials.

4

5 I have testified before US legislative and regulatory 10: 14
6 bodies on LNG safety. Last year I was invited to
7 testify before a Committee of the US congress on
8 matters relating to LNG tanker security and associated
9 potential LNG hazards. I served also on the expert
10 panel that provided advice to the General 10: 15
11 Accountability Office on its work related to LNG tanker
12 safety.

13

14 Section 2 - Project Involvement

15

16 I was approached relatively recently by representatives 10: 15
17 of Shannon LNG and its attorneys to perform an
18 independent assessment of the project technical work on
19 safety performed by other contractors and to indicate
20 my opinions on the various safety issues. I am 10: 15
21 retained by the law firm of Matheson Ormsby Prentice
22 (MOP) of Dublin who are the solicitors for Shannon LNG
23 to report to them on my findings. My testimony for the
24 Board is based on my review of the project materials
25 and the subsequent findings. I have neither 10: 15
26 participated in the original development of any of the
27 safety analysis, nor performed any assessments based on
28 independent calculations, with one exception. The
29 exception is the set of calculation results I provided

1 in late July 2007 to Environmental Resources Management
2 Limited (a contractor to Shannon LNG). These
3 calculation results were obtained by exercising the new
4 LNG Pool Fire Model, which I developed for the US Dept.
5 Of Transportation. This model represents more 10: 16
6 realistically the LNG fire characteristics observed in
7 field experiments. These results have been compared
8 with the more conservative (i.e. larger) hazard
9 distance values used by ERM and presented in its report
10 on the Quantitative Risk Assessment. 10: 16

11
12 Since July 2005. TMS has a 'task order' type of
13 contract with Hess LNG/Weaver's Cover Energy. Over the
14 past 2.5 years TMS has provided occasional and
15 relatively minor consulting services to Hess LNG on LNG 10: 17
16 properties and behaviour issues.

17
18 My involvement with Shannon LNG application hearings
19 began on December 20th, 2007. Specifically, my work in
20 this regard includes: 10: 17

- 21
22 1. Reviewing various documents related to the
23 application by Shannon LNG to An Bord Pleanála.
24 2. Evaluating the QRA performed by ERM for Shannon LNG.
25 3. Providing opinion on LNG siting requirements in the 10: 17
26 US and Europe by discussing the differences in the
27 requirements of the NFPA 59A standard the US DOT
28 regulations and the EN1473 Standard.
29 4. Preparing this statement of evidence.

1 5. Providing responses to and opinions on safety
2 concerns indicated in the submissions.

3
4 I have, in preparation for this oral hearing,
5 undertaken the following work:

10: 18

6
7 1. Reviewed the four volumes of the Shannon LNG
8 Terminal Environmental Impact Statement.

9 2. Reviewed the contents of the report entitled "Land
10 Use Planning QRA Studies of the Proposed Shannon LNG
11 Terminal", Report 02, September 2007, by ERM.

10: 18

12 3. Reviewed the questions raised by Ireland Health and
13 Safety Authority (HSA) and the responses provided by
14 Shannon LNG.

15 4. Reviewed several documents published by the UK
16 Health and Safety Executive on issues related to
17 land use planning, risk analysis and recommendations
18 on failure rates of equipment and hazardous dose
19 criteria.

10: 18

20 5. Walked over the entire area of the proposed Shannon
21 LNG terminal site in Co. Kerry on December 28, 2007,
22 reviewing the locations of various proposed
23 equipment and noting the site's geographical
24 relationship to the Ballylongford Bay and the
25 Shannon River Estuary. Mr. Inspector, I might also
26 add that I did do a second visit recently in
27 preparation for this appearance.

10: 19

28 6. Reviewed the questions raised in the submissions
29 related to safety and developed responses (see later

1 secti ons)

2
3 **Section 3 - Issues Considered**

4
5 **3.1. LNG Industry Safety Record**

10: 19

6 The worldwide safety record of the LNG industry is
7 enviable and unmatched by any other comparable
8 industry. Not a single injury or fatality has occurred
9 to a member of the public from the import, storage or
10 handling activity in terminals for over 40 plus years,
11 representing a combined operating time of about 15
12 million hours. The injury rate among the workers in
13 the industry is one of the lowest in all comparable
14 industries. Currently there are over 60 large LNG
15 Regasi fication Terminals (Import Terminals) and over
16 170 new terminals are proposed and some are under
17 construction. In the US, in addition to currently
18 operating six Import Regasi fication Terminals, there
19 are 57 LNG peak shaving facilities. During the periods
20 of low demand, peak shaving facilities store LNG either
21 produced on-site by liquefying pipeline natural gas or
22 received by trucks from import terminals. The stored
23 LNG is then vaporised and then fed into pipelines to
24 meet peak demand generally during the winter months.
25 Both import terminals and peak shaving facilities have
26 operated safely for over 60 years.

10: 20

10: 20

10: 20

10: 21

27
28 Trans-continental shipments of LNG in ocean-going
29 tankers started in 1959. The worldwide demand for LNG

1 has grown significantly since the 1960's and today over
2 250 LNG ships are plying the oceans safely delivering
3 the liquid to port in many countries, including Japan,
4 France, Belgium and many more, in some of the most busy
5 and the most congested ports of the world and near high 10: 21
6 population centres. Annual shipments of LNG exceeds
7 120 million metric tonnes. In the 60 years of shipping
8 over the oceans over 52,000 tanker shipments have
9 occurred worldwide covering over 150 million kilometres
10 of ship voyages without any significant LNG spills 10: 21
11 (other than very minor leaks through pipe gaskets and
12 small spills during make and break of the unloading
13 arms). As at the end of 2007 additional 125 ships of
14 capacity exceeding 200,000 m³ are on order.

15
16 The industry is highly regulated in the United States,
17 European Union countries and the United Kingdom and
18 other countries. Projects have to comply with very
19 strict requirements on site layout, mechanical design,
20 low public impact, emergency response planning, 10: 22
21 operational safety and personnel training. The ships
22 transporting LNG are built to international standards,
23 are of double-hulled design and have been from the very
24 beginning of the industry. The shore-based operations
25 and facilities of LNG terminals come under the purview 10: 22
26 of the National Regulatory Agencies. In the US it is
27 the US Department of Transportation. The standards for
28 the design of storage tanks and other systems in the
29 facility are indicated in the industry consensus

1 standard in the US, namely, the National Fire
2 Protection Associations' s "Standard for the Production,
3 Storage and Handling of LNG", also known as NFPA 59A
4 and by the standard EN1473 in the EU countries. Other
5 countries as well use the standards to ensure adequate 10: 23
6 designs. The stringent regulations in all countries
7 with LNG terminals (and lately the addition of security
8 requirements in these regulations), in addition to the
9 industries self-interest to operate extremely safely,
10 have been the principal cause of the safety success 10: 23
11 story.

12
13 There has never been an accident of any size affecting
14 the public, the environment or damage to property from
15 an import and regasification terminal or the associated 10: 23
16 tanker activity in over 60 years. However, there was a
17 large accident in 1944 in a peak shaving LNG facility
18 in Cleveland, Ohio. In this accident about 6,500 m³ of
19 LNG was released from two tanks. Post accident
20 investigation by the US Bureau of Mines (which is a 10: 24
21 part of the Department of Interior) indicated that the
22 release was most likely due to the use of improper
23 steel in tank construction. This accident involving
24 public fatalities stands as a single event in the
25 history of the otherwise unblemished record of the LNG 10: 24
26 industry. A consequence of this accident has been the
27 subsequent development of codes, standards and
28 regulations, whose implementation and enforcement have
29 resulted in the outstanding safety record of the

1 industry. The standards and regulations require the
2 use of LNG compatible steel and other materials,
3 designs to prevent leaks and releases, provision of
4 active and passive systems and technologies to minimise
5 the effects of any spill and the development of 10: 24
6 effective emergency response actions, of course in
7 consultation with and cooperation from local emergency
8 responders. Other post 1944 incident releases of LNG
9 reported in the literature are small in quantities and
10 are primarily due to failures in gaskets and releases 10: 25
11 from improper coupling between pipes segments during
12 transfer operations or in barge filling operations.
13 Therefore, Mr. Inspector, I would like to reiterate my
14 observation that LNG storage and regasification
15 facilities operate safely, have operated safely and 10: 25
16 that best practice systems and procedures are
17 implemented to prevent even the smallest of releases.
18 No other energy industry can boast of such an
19 outstanding safety record.

20 10: 25

21 **Section 3.2. Comparison of EN1473 AND NFPA 59A**

22
23 There are many similarities in the requirements
24 specified for LNG facility location, layout
25 construction and operation in both the EN1473:2007 and 10: 26
26 the NFPA 59A:2006 edition standards. However, there
27 are also fundamental and significant philosophical
28 differences between the two standards. It is not
29 possible state whether one standard is "better" than

1 the other simply because of different approaches to
2 ensuring public safety. Both standards, and I might
3 add the regulations in the US which are based
4 principally on the NFPA 59A: 2000 edition) have the same
5 general goal, namely to prevent and minimise any 10: 26
6 adverse effects on the public health and welfare
7 arising from the location and operation of an LNG
8 facility in the neighbourhood. There are also some
9 important differences between the NFPA 59A (2001
10 edition), the US DOT Regulations in 49CFR, part 193, 10: 27
11 and the positions taken by the US Federal Energy
12 Regulatory Commission (FERC). While the similarities
13 and difference among EN1473, NFPA 59A, DOT Regulations
14 (and also FERC's interpretation and application of DOT
15 regulations and, in additions, its own requirements) 10: 27
16 are in the details of a few requirements, it suffices
17 to state that the LNG plants built complying with
18 specific requirements of the US or European standards
19 are conservatively designed and operate safely.

20 10: 27

21 **Section 3.3. Suitability of the Shannon LNG site**

22

23 I have conducted field walkovers of the Shannon LNG
24 proposed LNG import, storage and regasification site
25 and noted the locations of the proposed water storage 10: 27
26 pond, administrative building, the four LNG tanks, the
27 jetty and the proposed vaporisation and process areas.
28 I observed the local geography and the topography and
29 was also appraised of the proposed terraced site

1 preparation. I have also reviewed the site terraced
2 construction approach indicated in the EIS Volume 2,
3 section 2.5.2.4 and figure 3.9 Volume 3. I noted the
4 features of the area surrounding the site, including
5 the location of the closest residence to the site 10: 28
6 boundary as well as the proximity of the residences
7 along the Coast Road proximate to the site's southern
8 boundary.

9
10 In my LNG consulting I have visited a number of 10: 28
11 operating LNG facilities and proposed terminal sites.
12 Each proposed site has its desirable attributes and
13 shortcomings. However, it can be said that Shannon LNG
14 site represents one of the most suitable locations for
15 an LNG import, storage and regasification facilities 10: 29
16 because of:

- 17
- 18 1. The deep water attributes of the Shannon river
19 estuary.
- 20 2. Relatively large distances to existing residences. 10: 29
- 21 3. The unique site topography which lends itself to the
22 development of terraced construction.
- 23 4. Sloping ground towards the water.

24
25 The terraced topography of the proposed site provides 10: 29
26 additional safety against the effects of any potential
27 releases at the jetty or from storage tanks. Any
28 vapour cloud resulting from postulated potential
29 releases would have difficulty in dispersing into the

1 southerly direction because of the very steep up-slope
2 topography in this direction. It is noted that the
3 nearest residences are located in this direction.
4 Also, the lower parts of any postulated and potential
5 pool fire in the plant would be masked or shielded by 10: 29
6 the ground slope and the terraced topography, thus
7 reducing their effects. By "their effects" I mean fire
8 effects. A higher fraction of the overall heat output
9 from a fire originates from the lower parts.
10 Therefore, masking the lower part of any fire results 10: 30
11 in less intensity being felt at a distance, resulting
12 in a smaller hazard area.

13
14 It should be noted that none of the above discussed
15 beneficial effects of the topography have been included 10: 30
16 in the QRA calculations. Therefore, the results of the
17 QRA are very conservative.

18 19 **Section 3.4 Environmental Impact Statement**

20 10: 30
21 I have reviewed the relevant sections of the EIS and am
22 satisfied that the EIS documents presented to the Board
23 contain the appropriate planning information that is
24 provided in many other EIS's that I have reviewed. I
25 do not claim expertise in ecological issues discussed 10: 31
26 in the EIS. However, I am qualified to discuss the
27 adequacy of the overall design of the facility, the
28 storage tanks, process equipment, fire protection,
29 spill impoundment and safety assessments described in

1 the EIS.

2
3 Mr. Inspector, I will briefly go through some of my
4 reviews and my opinions on the various attributes in
5 the proposed facility. 10: 31

6
7 **Section 3.4.1:** The LNG storage tanks [described in
8 section 3.6.1 EIS Volume 2] are proposed to be "full
9 containment" type LNG tanks. A full containment tank
10 is one in which the liquid is contained in an inner 10: 31
11 tank (SLNG tank is made of 9% nickel steel) and the
12 outer tank being formed of pre-stressed concrete with
13 vapour tight dome over it. This type of tank is
14 approved under the EN1473 standard and the NFPA 59A
15 Standard (2006 edition). Each tank shall have a 10: 32
16 capacity of 200,000 m³ of liquid storage and of outer
17 dimensions of 96m diameter X 50.5m high from the top of
18 the dome to the tank slab (figure 3.9 EIS volume 3).
19 Because of the terrace construction of the site and the
20 location of the tanks at the lowest terrace, 10: 32
21 approximately 20 metres of the height of the tank will
22 be obscured by the ground when looking north from
23 outside the site boundary. It is my opinion that tank
24 design and operating conditions of the tanks described
25 in the EIS Volume 2, Section 3.6.6 are consistent with 10: 32
26 accepted design parameters for full containment tanks.

27
28 **3.4.2. The Vaporisers:** Shannon LNG has proposed a
29 hybrid heat exchanger system (plate-frame and shell and

1 tube exchanger) to vaporise the LNG and send the gas to
2 the natural gas transmission pipeline. The heat
3 exchangers include seawater-to-monoethylene-glycol
4 (plate-frame exchangers) and monoethylene-glycol-to-LNG
5 vaporisation (shell and tube). Seawater heat 10: 33
6 exchangers are in widespread use throughout the world
7 in a number of LNG and other plants.
8

9 3.4.3. **Impoundments:** An impoundment basin, or sump,
10 of size 10.1m x 10m x 4m depth below the grade is 10: 33
11 proposed to be provided for each set of two tanks. Any
12 hypothetical or potential releases from any of the
13 tanks will be channeled into the impoundment basin
14 servicing the tank. The size of the impoundment basin
15 design is adequate considering that the design is based 10: 33
16 on the more conservative requirements of NFPA 59A,
17 section 5.2.2 (2006 edition). The NFPA requirement is
18 to size the impoundment basin to hold 100% of the
19 release from a transfer piping with the highest flow
20 rate for 10 minutes or during a shorter duration where 10: 34
21 there is a demonstrable shut down provision. Shannon
22 LNG facility design includes the provision of
23 surveillance and automatic shut down within 30 seconds
24 of the release. The design of the impoundment basin is
25 very conservative and has provided for impounding a 10: 34
26 spill at the full LNG pump rate out of the tank for 10
27 minutes notwithstanding the quick shut down capability.
28
29

1 **3.4.4 Hazard Detection, Control Systems and Fire**

2 **Protection:** My review of the (EIS section 3.10.1
3 through section 3.10.3 in volume 2) indicates that the
4 proposed type and number of safety controls, hazard
5 detection and fire protection systems proposed are in 10: 35
6 keeping with best engineering practices for LNG
7 facilities and conform to the requirements of EN1473.
8 For example, it is important to provide redundant and
9 functionally different systems to detect any potential
10 LNG leak in the possible ignition of vapours. These 10: 35
11 are achieved by installing in strategic locations
12 detectors that detect temperature changes, vapour
13 concentration, fire induced smoke and infrared and
14 ultraviolet signals from the flame detection. Normal
15 locations for these type of detectors are near tank 10: 35
16 relief valves, gas vents, impoundment basins,
17 vaporisation units, unloading jetty or platform and
18 storage tank roof platform. In the Shannon LNG design
19 these are indicated to be the locations where such
20 devices will be provided. In addition, Shannon LNG 10: 35
21 design includes CCTV monitoring of all process areas,
22 tanks and shipment loading areas. It is my opinion
23 that these system, if maintained in working condition,
24 will ensure a high degree of safety of the plant.

25
26 The active fire protection systems that are to be
27 provided include the firewater system, the high
28 expansion foam dispensing systems (in the impoundment
29 basins), portable dry chemical units and dry chemical

1 extinguishment and/or nitrogen gas snuffer systems (to
2 be located on the pressure relief valves and the cold
3 vents on the storage tanks and warm vent discharge
4 areas). These designs are in conformity with the
5 requirements of EN1473:2007 (section 6.9.3.7, clause 10:36
6 13, and specifically section 13.4 to 13.6), and also,
7 in principle, conform to the requirements of NFPA 59A,
8 Chapter 12.

9 **INSPECTOR:** Dr. Raj, can I just stop
10 you there for a moment so 10:37
11 that we don't pass on it and I forget it. You are
12 talking about closed circuit TV monitoring, does that
13 imply that you can actually see a gas leak under Irish
14 atmospheric conditions?

15 **DR. RAJ:** Mr. Inspector, yes, because 10:37
16 as you saw from Dr. Havens
17 film yesterday, even in the desert conditions where
18 the relative humidity was 5% you could see the gas,
19 because it condenses water from the atmosphere. So any
20 leak in the Shannon LNG plant, if it occurs at all. 10:37

21 **INSPECTOR:** I got the impression
22 that the opposite would
23 apply here, where you had a high atmospheric vapour
24 content already. Are you saying that, in fact, it is
25 the other way around, that it will be more visible 10:37
26 here?

27 **DR. RAJ:** Yes indeed, Mr. Inspector.
28 Because it condenses water
29 from the atmosphere, the more water there is in the

1 atmosphere, which is what the high humidity represents,
2 it would be more visible.

3 **INSPECTOR:** Okay. Thank you for that.
4 Please continue.

5 **DR. RAJ:**

10:38

6
7 **Section 3.5: Safety assessments (QRA) and its adequacy**

8 The process of quantitatively evaluating the risks that
9 may arise from a proposed facility that receives,
10 stores and handles the hazardous materials involves the
11 following steps:

10:38

- 12
13 1. Identifying the scenarios of potential release of
14 the material and the equipment from which such
15 releases may occur.
- 16 2. Determining the rates of release and quantity of
17 release of the material.
- 18 3. Cataloging the probabilities of occurrence of each
19 scenario, location and type of release.
- 20 4. Classifying the post release behaviour of the
21 hazardous material (fire, generation and dispersion
22 of vapour, explosion, etc.), and also obtaining the
23 conditional probabilities of different types of
24 behaviour.
- 25 5. Determining the distance or area of hazards to
26 people and property from each type of hazard and
27 each condition of release; The criteria for each
28 type of hazard to people and property being based
29 on accepted standards and official publications of

10:38

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1 the local or national regulatory agencies.

2 6. Developing the values for the individual risks
3 either at a specified distance from the facility or
4 calculating individual risks at the nodes of a
5 grided area (the result of adding gridlines to 10: 39
6 create identifiable blocks around the facility) with
7 which to block contours of constant individual risk
8 around the facility.

9 7. Developing the profiles for societal risk (the
10 annual probability of affecting, adversely, a given 10: 39
11 number of people plotted against the number of
12 people affected).

13 8. Evaluating the individual risk patterns surrounding
14 the plant with the criteria for risk acceptability
15 set by the local community, state or national 10: 40
16 regulatory agency or (in their absence) using the
17 most widely recognised international guidelines.

18 9. Performing sensitivity analysis by perturbing those
19 parameters that have the significant influence on
20 the risk results. 10: 40
21

22 The Quantitative Risk Assessment performed by
23 Environmental Resource Management Limited tracks the
24 above steps very closely.
25

26 3.5.1. Considerations of events and occurrence 27 frequencies

28 In my opinion, the QRA has been performed properly,
29 using published data and methods that are available in

1 peer reviewed publications. Where the data are not
2 published but are available in public sources such data
3 have been used. This is particularly the case for
4 failure frequencies of components and systems. The
5 public sources include governmental agencies, such as 10: 40
6 the UK HSE, Professional Associations, e.g. The Society
7 of International Gas Tanker and Terminal Operations
8 (SIGTTO), UK Onshore Pipeline Operators Association, UK
9 Advisory Committee on dangerous substances etc., and
10 certified commercial entities. As indicated in section 10: 41
11 3.1 of this evidence, because of the very good safety
12 record of the LNG industry, failure data that are
13 directly applicable to LNG facilities are not available
14 and I would say, Mr. Inspector, thankfully. ERM has,
15 therefore, used component failure data from other 10: 41
16 similar industries. The use of such "imported" data
17 from other industries results in attributing to LNG
18 terminal components failure rates which are, very
19 likely, higher by one or two orders of magnitude than
20 what they may actually be in LNG plants. Therefore, 10: 42
21 the QRA results for Shannon LNG have a high degree of
22 conservatism included in them.

23
24 The QRA has also included in its consideration such
25 scenarios as are highly improbable. For example, the 10: 42
26 release of liquid from a full containment tank is
27 assumed even though the very design basis of the full
28 containment tank is to prevent release of either liquid
29 or vapour to the environment. Also, in assessing

1 potential scenarios of LNG behaviour in the
2 environment, the QRA has made very conservative
3 assumptions on the conditional probabilities. For
4 example, in the scenario of potential releases from a
5 full containment tank the QRA assumes the relatively 10: 42
6 low probability of ignition even though it can be
7 argued that such releases can only occur if caused by a
8 highly energetic event. Such events are always
9 accompanied by significant heat releases, which will
10 result in the ignition, with a very large probability, 10: 43
11 of the release LNG. Mr. Inspector, I might just
12 indicate to you that in Dr. Havens film that we saw,
13 even though all precautions are taken in the experiment
14 you saw the ignition of the vapour cloud. So, any
15 agency that causes the release is very likely to 10: 43
16 ignite. Whereas in the QRA they only assumed 50% of
17 the time for very large releases would be ignited
18 quickly. This has implications on the conservative
19 calculations in the QRA.

20
21 To continue with the evidence. The result of such
22 assumptions caused the QRA results to predict higher
23 risks compared to what the real risks may be. The QRA
24 has also considered extremely low probability events in
25 the interest of full and complete evaluation. Some of 10: 44
26 these low probabilities scenarios may indicate
27 comparatively large distances to which their effects
28 may be felt. However, these highly improbable and
29 theoretical assumptions do not represent and events

1 that one reasonably expect to occur within the lifetime
2 of the facility. One should recognise that some of
3 these events considered are postulated to occur once in
4 several tens of millions of years; that is in time
5 frames comparable to many epochs that have occurred in 10: 44
6 earth's history.

7
8 **3.5.2. Hazard Types and Estimation of Hazard Distances**

9 The QRA has considered three types of hazards, namely,
10 the radiant heat effects of pool fires, the area 10: 44
11 covered by vapour fires after the ignition of a
12 dispersed vapour and blast over pressure events. The
13 consideration of these types of hazards are consistent
14 with the experimentally known behaviour of LNG (and the
15 vapour generated by its evaporation) in the 10: 45
16 environment. Except the QRA has assumed that LNG
17 vapours, Mr. Inspector, will have explosion but no
18 experiment has shown that in the open, that LNG vapours
19 can explode. So, there is another built-in
20 conservative calculation for risk. 10: 45

21
22 The types of releases and the magnitude of release
23 sizes assumed are reasonable and are on the
24 conservative side. The hazard areas are calculated
25 using the HSA guidelines for effects. The overall 10: 45
26 result of these calculations is to "predict" larger
27 areas of potential hazard than they may really be.

28
29 **3.5.3. Risk Criteria.** Mr. Inspector, with your

1 permission I will skip this because these were very
2 eloquently indicated yesterday by Mr. Pat Conneely of
3 the HSA and so I will just be repeating them.

4
5 HSA's policy on the types of land use that exists 10: 46
6 within each zone and their implications on the
7 permissibility, permissibility with restrictions, or
8 rejection of a proposed facility are similar to those
9 postulated by the UK HSE. Many facilities meeting the
10 above criteria have been permitted in the UK without 10: 46
11 any adverse effect on the public.

12
13 The QRA results indicate that the individual risk of
14 dangers dose or worse to a hypothetical resident in the
15 nearest residence to the property is about 1/3 of the 10: 46
16 risk per HSA criteria. Also, on the basis of the
17 societal risk guidelines in the UK HSE and the Dutch
18 requirements, the risk for the Shannon LNG site is well
19 within the values set in these international criteria.

20 10: 47
21 It is my opinion that the risk contours presented by
22 the QRA have a high degree or level of confidence.
23 This is because of the conservative assumptions made in
24 the QRA on various failure probability values, values
25 for the conditional probabilities of LNG behaviour, 10: 47
26 modeling the effects of LNG behaviour and estimation of
27 the magnitude of the hazards.

1 4. Concl usi ons
2

3 It is my opini on that if the Shannon LNG faci lity is
4 designed, constructed and operated in accordance with
5 the requirements of applicabl e Ireland and European 10: 47
6 standards as described in the applicants EIS, the
7 faci lity will meet safety requirements set out in
8 EN1473 and the HSA guidance. The QRA resul ts further
9 indicate a very low level of individual and societal
10 risk. Therefore, it is my opini on that the Shannon LNG 10: 48
11 terminal design is safe.

12
13 Mr. Inspector, I would like to now address some of my
14 responses to the questions raised in the submissions to
15 the Board. 10: 48
16

17 Submi ssi on L003 by Adam Kearney & Associates and
18 L054(30) by K ilcol gan Residents Associ ation: We do not
19 fully understand the reactive or explosive properties
20 of LNG (US GAO report). Even the 19 international LNG 10: 48
21 experts consul ted by the US Government Accountabi lity
22 Offi ce unabl e to agree.

23
24 Response: The submi tter has mi si nterpreted the GAO
25 report. The GAO experts, of which I was one, do agree 10: 48
26 on LNG properties. The experts could not reach
27 consensus on the likeli hood of the speci fic scenari o of
28 a cascading fai lure in a LNG ship, nor on its
29 postul ated effects. To quote from the GAO report:

1 "Experts agreed that (1) the most
2 likely public safety impact of an LNG
3 spill is the heat impact of a fire; (2)
4 explosions are not likely to occur in
5 the wake of an LNG spill unless the LNG
6 vapours are in confined spaces; (3)
7 some hazards. Such as freeze burns and
8 asphyxiation, do not pose a hazard to
9 the public. Experts disagreed with the
10 heat impact and cascading tank failure
11 conclusions reached by Sandia National
12 Laboratories Study with the Coast Guard
13 users to prepare Waterway Safety
14 Assessments (WSAs)."

10: 49

15 LNG (liquid) is neither reactive nor explosive. All
16 experiments conducted to date with actual LNG vapours
17 in the open (unconfined) being ignited by either a
18 charge or by piloted ignition source have resulted in
19 the formation of only a deflagrative (i.e. slow burning
20 vapour fire) and no explosion type of burning.

10: 50

10: 50

21 Mr. Inspector, I might add that I personally
22 participated in field experiments, I designed and
23 carried out these experiments in a facility called
24 China Lake in California back in the 70's. So, I can
25 attest to that personally.

10: 50

26 Only under very limited circumstances, when the vapours
27 of LNG are mixed with the proper proportion (5% to 15%
28 by volume) in air and ignited under fully confined or
29 near fully confined conditions, there may result, and
the accent is on the word "may", result is explosive
burning. In the latter type of behaviour overpressures
would occur and their effects would be felt far outside

10: 50

1 the burning vapour cloud. None of these effects have
2 been observed in any experiments conducted in the open
3 to date.

4
5 The disagreement among the 19 experts of the GAO, which 10: 51
6 the submission alludes to, has to do with the causes
7 and details of if, when and how a ship can suffer
8 multiple tank failures and the effect of already
9 spilled liquid from one tank to initiate "cascading"
10 failures of other tanks. The disagreement, therefore, 10: 51
11 is not on the LNG properties or explosivity.

12
13 Submission L004 by Mary Kelly-Godley and L043 by
14 Raymond and Margaret O' Mahony: Sheltering behind a
15 tree to be safe. 10: 52

16
17 Response: This submission may have arisen because of
18 the incorrect interpretation made by a comment at the
19 public meeting on 29th October, 2007, in response to
20 questions about the consequences of a large release of 10: 52
21 LNG from a carrier. The comment was not intended to
22 suggest that sheltering behind trees is the only means
23 of protection against radiant heat effects of an LNG
24 fire but to highlight the fact that simple objects that
25 cast a shadow in visible light also are opaque to 10: 52
26 radiant heat and, therefore, offer protection. In a
27 recent experiment -- this is a experiment that I
28 conducted, Mr. Inspector -- a single sheet of newspaper
29 reduced the radiant heat flux by a factor of almost 4.

1 Many actions can be taken by a person exposed to
2 radiant heat from any fire, including running away from
3 the fire, hiding behind objects such as trees,
4 buildings and automobiles, running inside a building or
5 in some cases even holding a newspaper sheet in front 10: 53
6 of the face if one is available. LNG fire durations
7 are relatively short, of the order of minutes, and for
8 such durations temporary sheltering in place may be the
9 most effective least harmful option.

10
11 Submission L011 by Kathy Sinnott: LNG is an incredibly
12 explosive, condensed form of gas, very flammable. Even
13 a small leak can do a great deal of damage. A serious
14 accident or terrorist attack would result in a nuclear
15 size explosion minus the radiation. 10: 53

16
17 Response: LNG is not explosion. LNG vapours are not
18 explosive in the open, as has been discussed in
19 response to submissions 3 and 54. The GAO report
20 referenced in the submission confirms this. 10: 53

21
22 Small leaks of LNG in the Shannon LNG plant cannot do
23 great damage simply because in the proposed plant
24 design systems are provided to monitor leaks, take
25 immediate action to limit the quantity released and 10: 54
26 initiate emergency response actions.

27
28 The comparison of the pool burning of LNG or the
29 burning of a dispersed LNG vapour cloud with nuclear

1 explosions is quite incorrect and scientifically
2 unsupportable. A nuclear explosion releases
3 substantial energy in matters of fractions of a second,
4 resulting in the production of very high intensity
5 blast pressure waves. Even the most conservative 10: 54
6 estimate of the release times of large quantities of
7 LNG from a ship (through very large, metre size, holes)
8 is of the order of several minutes, or actually several
9 tenths of minutes. The LNG released itself cannot
10 burn. It has to evacuate first, then the vapour has to 10: 55
11 mix with the atmospheric air to form cloud of vapour
12 concentration in the flammable range and meet an
13 ignition source that is active within the part of the
14 vapour cloud that has flammable concentrations. The
15 phenomena of evaporating and mixing with air takes 10: 55
16 significant times of the order of tens of minutes.
17 Therefore, the energy release time in LNG burning when
18 compared to the energy release times in a nuclear
19 explosion is about a million times longer and
20 correspondingly the hazardous effects in the area are 10: 55
21 significantly smaller.

22
23 Finally, it should be clearly noted that the radiant
24 heat from and LNG fire is no different from the radiant
25 heat that one feels when standing in front of a home 10: 55
26 fireplace. So, comparison of the hazardous effects on
27 people, property or the environment from any LNG
28 release with those from a nuclear explosion is
29 improper, unscientific and unjust.

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Mr. Inspector, you may recall that Dr. Havens made exactly the same point two days ago.

Submission L014 by Chloe Griffin: Concern: It is claimed that LNG is perfectly safe. 10:56

Response: That LNG has been handled, stored and transported safely over the past 60 years is factual. This has been discussed in section 3.1. 10:56

Submission L014 by Chloe Griffin and L54 by Kilcolgan Residents Association: It is claimed that LNG vapour floats through the atmosphere into space. 10:56

Response: It is possible that the submitter misinterpreted the statement attributed to a "expert". The expert may have indicated that when LNG vapours are mixed with air and diluted (also heated by the ground or water substrate and by the sun) the vapours may become positively buoyant and rise in the atmosphere and would be further diluted. 10:56

From my own experimental experience in the field, I can attest to the fact that LNG vapours, when they are released, are heavier than air and they tend to be heavier than air for significant distance. 10:57

Submission 54 by Kilcolgan Residents Association: A

1 report by IoMosaic quote a 3.7km hazard range to 50%
2 lethality.

3
4 Response. The IoMosaic report alluded to in the
5 submission does not provide the details of the 10: 57
6 scenarios and the mathematical models used and the
7 assumptions made by the authors in postulating the
8 above 50% lethality distance. They seem to have
9 assumed the release of 150,000 m³ of LNG in five
10 minutes from an LNG tanker. Neither the type of the 10: 57
11 accident nor the incident that can produce a size and
12 rate of spill, nor the criterion for the lethality from
13 exposure to radiant heat from an LNG fire has been
14 indicated. Last, but not the least, the assessment
15 seems to have ignored the findings presented in their 10: 58
16 own report that for LNG pool fires greater than about
17 25m in diameter the level of heat flux emanating from a
18 fire decreases (well below the 220kw per square assumed
19 in their assessment). Also, the authors ignore the
20 findings from recently published research that LNG 10: 58
21 fires become very smoky, and consequently put out very
22 little radiant heat; the emitted heat is almost of the
23 same magnitude as from a similar sized gasoline fire.

24
25 In view of the above stated and unstated assumptions 10: 58
26 and scant details of other parameters used, it is
27 difficult to evaluate IoMosaic's calculation procedure
28 or its accuracy. Additionally, it is impossible to
29 develop an opinion on the release scenario since no

1 details are provided. Finally, the report alluded to
2 is not a peer reviewed publication in a technical
3 journal and hence, the results and claims should be
4 viewed with skepticism.

10:59

5
6 I might also add that this so-called report is an
7 advertisement issue on the part of IoMosaic.

8
9 Submission L054(2) by KRA: The evidence obtained from
10 Dr. Jerry Havens report prepared by the Public
11 Utilities Commission of the State of California for the
12 Federal Energy Regulatory Commission highlights
13 worrying scientific evidence. . . . He has provided (that
14 is Dr. Jerry Havens) detailed analysis supporting his
15 conclusion that there should be a minimum of 3 miles
16 between an LNG terminal and a densely populated area.

10:59

10:59

17
18 Response: The above submission refers to the report by
19 Dr. Havens to the California Public Utilities
20 Commission (CPUC) and his testimony filed with the
21 Federal Energy Regulatory Commission regarding the SCS
22 project proposed in Long Beach, California. A detailed
23 report has been filed with FERC rebutting each and
24 every contention of Dr. Havens and pointing out the
25 various unscientific assumptions and incorrectness in
26 his analysis. In this rebuttal report it has been
27 clearly pointed out how his conclusions are based on
28 incorrect science, arbitrary and scientifically
29 unsupportable extrapolation of the results, arbitrary

11:00

11:00

1 reduction in regulatory criteria for calculating
2 hazardous effects and neglect of real experimental
3 information and natural phenomena that limit the extent
4 of hazard. These unscientific assumptions lead to his
5 calculation of a 3 mile hazard distance. It is noted 11:00
6 that Dr. Havens' analysis is based on the premise of
7 very rapid release on to the water surface of 12,500 m³
8 of LNG from each of the three tanks of the carrier.
9 His results have nothing to do with the releases from
10 this proposed terminal or the ship-to-shore transfer 11:01
11 operations.

12
13 Submission 54(45) by KRA: A report on the LNG blast in
14 Algeria (see attachment 24) mentions the contaminant
15 gases that LNG is made up of. Note that when HSE, 11:01
16 Sandia and other regulators do test with LNG it is with
17 100% pure methane. We object that the level of
18 contaminant gases to be shipped by Shannon LNG has not
19 been disclosed and request that the Board ask the
20 developer to state the level of the contaminant gases 11:02
21 they expect to have in the LNG shipments and whether
22 they will vary depending on the origin of LNG in that a
23 QRA be undertaken and analysed with this information in
24 mind.

25 11:02
26 The submission goes on to state: A 1980 Coast Guard
27 study entitled "LNG research at China Lake" states that
28 LNG imported into this country is often far from pure
29 and it reveals that vapour clouds made from impure LNG

1 actually explode as readily as the highly volatile LPG.
2 When natural gas is super-cooled and turned into a
3 liquid as much as 14% of the total cargo shipped as LNG
4 may actually be LPG or other hydrocarbon fuels,
5 according to the Coast Guard report. Natural gas 11:02
6 contains these other fuels when it is pumped from the
7 ground. LNG containing these so-called higher
8 hydrocarbons is known as "hot gas" and has higher
9 energy content than pure methane. The Coast Guard
10 report reveals that vapour clouds of LNG containing at 11:03
11 least 13.6% of these other fuels can detonate just like
12 pure propane gas. The agency concluded in its report
13 that this deserves "special consideration as the
14 commercial LNG being imported into the US east coast
15 has about 14% other hydrocarbons". 11:03
16

17 Response: The accident in Skikda, Algeria, referred to
18 in the submission occurred in a natural gas processing
19 and liquefaction facility and not in an LNG import and
20 storage terminal. There are significant differences 11:03
21 between a natural gas processing facility and an LNG
22 receiving terminal. In the former, hydrocarbon
23 separation processes and storage of heavier hydrocarbon
24 liquids and separated LNG take place. The only
25 similarity between the two facilities lies in LNG 11:04
26 storage and marine jetties. In the Algerian incident
27 referenced in the submission the LNG storage and
28 loading jetties were totally unaffected by the
29 incident.

1
2 Tests were conducted in the "China Lake, California"
3 with LNG vapours being ignited in the open by normal
4 ignition sources. Mr. Inspector, I made reference to
5 this earlier in my evidence. The cloud did not 11:04
6 explode, but burned only as a flash fire back to the
7 source of vapour. The other China Lake tests alluded
8 to in the submission were conducted with room
9 temperature mixture of vapours and methane, propane,
10 together mixed with the chemically correct amount 11:04
11 ("stoichiometric quantity") of air and held in a five
12 metre diameter hemispherical thin polyethylene balloon.
13 The vapour-air mixture was ignited by a 1kg booster
14 explosive (and not a flame ignition as may be expected
15 in normal urban area). Even under these circumstances 11:05
16 only those mixtures that contained close to 14% propane
17 in the methane-propane vapour (mixed, of course, with
18 the proper amount of air) and ignited by an explosive
19 charge experienced an explosive burning. Higher
20 concentrations of methane in the mixture did not result 11:05
21 in an explosive burning, even when set off by an
22 explosive charge.

23
24 The sources from which LNG is proposed to be imported
25 into the Shannon LNG facility are not confirmed yet. 11:05
26 The composition of LNG from different sources varies.
27 However, except for one source (Libya), LNG from most
28 other sources has methane concentrations in excess of
29 88%. That means only less than 12% are heavier

1 hydrocarbons, such as ethane, propane, butane and so
2 on. When LNG spills on the ground or on water it
3 evaporates, selectively releasing pure methane vapour
4 into the atmosphere. That is, LNG undergoes what is
5 termed in chemical engineering as a "fractional
6 distillation". The fractional distillation, resulting
7 in the release of high concentration methane vapour,
8 continues for almost 80% of the total duration of
9 evaporation of the liquid. By the way, these have been
10 measured, Mr. Inspector, and I have given the
11 references.

11:06

11:06

12
13 In conclusion, no LNG vapour cloud explosion is
14 possible in the open, even if the LNG has over 14%
15 propane concentration, unless certain unique and rare
16 conditions prevail. The chance is essentially zero
17 that all of these conditions will occur in the open
18 area surrounding the proposed Shannon LNG facility; the
19 conditions that must occur simultaneously include the
20 ignition of a vapour cloud by a (currently
21 non-existent) explosive charge and the concentration of
22 the vapour containing heavier hydrocarbon vapours is
23 exactly 8%. Therefore, the conditions simulated in the
24 China Lake experiments cannot occur in any potential
25 spill at the proposed Shannon LNG terminal.

11:06

11:07

11:07

26
27 That concludes to my responses to submissions that were
28 submitted to the Board. I have since developed some
29 responses to the written questions and oral submissions

1 made by Mr. David Robinson of Safe Haven in this
2 hearing in the past two days and, if it is acceptable
3 to you, I will be happy to read that, Mr. Inspector.

4 **INSPECTOR:** Please continue.

5 **DR. RAJ:** Other questions raised by 11:08
6 Mr. Robinson have been
7 answered by many of my colleagues here so I will take
8 those questions that are within the purview of my
9 expertise.

10 11:08
11 Question 6(b): The percentage of contaminant gases in
12 LNG that make it as explosive as LPG. This is of
13 extreme importance as when LNG is spilled on water and
14 regasified the LNG companies will lead you to believe
15 that regasified LNG will not explode. Please note, on 11:09
16 19th January, 2004, in Skikda, Algeria, an LNG vapour
17 cloud did explode, resulting in the death of 27 souls
18 and the injury of 120 people. This is known as
19 a "Seeded" explosion. In this case a steam boiler blew
20 up under a vaporised cloud of LNG. This phenomena is 11:09
21 not fully understood but is believed to alter the
22 explosive range of a gas cloud which normally 5% to 15%
23 in air, it is thought that the explosive range could be
24 altered to 5% - 45% in air if the LNG has contaminant
25 gases that are higher than 14%. That is 86% methane 11:09
26 and 14% butane, ethane and propane. The latter three
27 being detonator gases. Hence the reason for this
28 question.
29

1 Response: Some of the concerns in this submission have
2 already been responded to in response to a submission
3 from the Kilcolgan Residents Association.
4

5 Mr. Robinson's characterisation that in the Skikda 11: 10
6 accident LNG was released is incorrect. There have
7 been no official findings so far on what gases were
8 involved in the explosion. In regard to this accident
9 FERC, in its final Environmental Impact Statement on
10 the Weaver's Cove Energy application said: 11: 10

11 "On January 19th, 2004, a blast
12 occurred at Sonatrachs, Skikda, Algeria
13 LNG liquefaction facility that killed
14 27 and injured 56 workers. No members
15 of the public were injured. Preliminary findings of the accident
16 investigation suggest that a cold 11: 11
17 hydrocarbon leak occurred at
18 liquefaction Train 40 and was
19 introduced to the high pressure steam
20 boiler by the combustion air fan. An 11: 11
21 explosion developed inside the boiler
22 fire box which subsequently triggered a
23 larger explosion of the hydrocarbon
24 vapours in the immediate vicinity. The
25 resulting fire damaged the adjacent
26 liquefaction process and LPG separation
27 equipment of Train 40 and spread to
28 Trains 20 and 30. Although Trains 10,
29 20 and 30 had been modernised in
1998-1999, Train 40 had been operating
with its original equipment since start
up in 1981".

24 The reason I provide this verbatim quotation,
25 Mr. Inspector, is to note that FERC never referred to 11: 11
26 the vapours that were released in the Skikda accident
27 as LNG vapours. It is hydrocarbon vapours, which could
28 be anything because there was a lot of storage of other
29 materials in that facility.

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Question 7: In your risk assessment deliberations did you take into account that the Surface Emissive Power of a large LNG Pool Fire is unknown? (Page 12 of the above report)

11:12

Response: There has never been an LNG pool fire either from an operating import terminal or from a ship. While no experimental data exists beyond 35m diameter LNG pool fires, it is clear from the data available that as the size of the pool fire increases the fire Emissive Power decreases. GAO recognised the lack of experimental data for larger fires and has recommended further research on this issue. However, a recently published US DOT report, of which I am the principal author, indicates a model for calculating large LNG fire Emissive Powers. This model has also been published in a peer reviewed technical paper recently. I give the citation for the paper.

11:12

11:13

11:13

Question 8: Mr. Gordon Milne, Senior Analyst of Lloyd's Register of Shipping comments in a document released under the Freedom of Information to Safe Haven entitled "Explosions and Gas Release from LNG Carriers" that 1.5kw per metre squared is safe.

11:13

Response: Mr. Milne in his paper does not provide the scientific source on which he based his above statement. To the best of my knowledge, Mr. Milne is

1 not a researcher in fire effects on people. Without
2 knowing the basis of this statement and not knowing the
3 published source of such information it is difficult to
4 comment on its credibility.

11:14

5
6 In addition to written questions, Mr. Robinson made
7 some oral statements and submissions and I would like
8 to respond to them.

9
10 Submission 1: In the United States it is required to 11:14
11 consider a hole of 12 metres on the side of a tanker to
12 determine the potential hazard for LNG release from the
13 carrier.

14
15 Response: It is not clear what document or source that 11:14
16 Mr. Robinson used to make the above statement. To the
17 best of my knowledge, no such requirement exists in any
18 regulations in the United States.

19
20 Submission 2: Spill of 1/5 content of an LNG tanker 11:14
21 will create a pool fire with the hazard zone of 1.9km
22 to 5kw per metre squared radiant heat flux level.

23
24 Response: MR. Robinson did not state the source of the
25 claim of 1.9km distance to a pool fire hazard from a 11:15
26 ship spill.

27
28 Sandia's report provides calculated distances to hazard
29 from LNG pool fire and water for the different assumed

1 conditions. It has to be emphasised, the word "assumed
2 conditions". The correctness of the model and the
3 appropriateness of the parameter values used in the
4 Sandia study have been questioned in a filing with
5 FERC. It has been shown in this filing that with 11: 15
6 proper characterisation of LNG fires of diameters
7 considered in the Sandia Report, a substantial
8 reduction in the hazard distance results. For example,
9 from Sandia's calculated value of 1,579m to 630m from
10 the fire centre for the same size fire. 11: 15

11
12 Submission 3: At this distance a person's skin will
13 experience a second degree burn when exposed to a
14 radiant heat flux of 5kw per metre squared for 30
15 seconds. 11: 16

16
17 Response: Mr. Robinson contended that at 5kw per metre
18 square radiant heat flux level anyone exposed for 30
19 seconds would suffer a second degree skin burn. In my
20 opinion, this claim is not correct. Field tests with 11: 16
21 LNG fires were conducted under a contract from the US
22 Department of Transportation. I was not only the
23 principal researcher but the experimental subject in
24 this field test, where I exposed myself to the heat.
25 In these tests I was in civilian clothing, with my face 11: 16
26 and head unprotected and was exposed to radiant heat at
27 an average of 5kw per metre squared for 30 seconds
28 several times. I can attest to the fact that in these
29 field tests with LNG fire I experienced neither a

1 severe pain nor a skin burn nor blisters on the skin.
2 By the way, Mr. Inspector, this test was witnessed by
3 all of the Federal Agencies, about 30, people from a
4 distance of 250 metres, whereas I was very close to the
5 fire, 20 feet from the fire. This series of tests 11:17
6 forms the very first time that a full scale test has
7 been conducted with a live person with instruments
8 attached to measure the heat flux incident on the skin.
9

10 11:17
11 The final report giving the details of the test, data
12 gathered and conclusions reached is available on the
13 web site of the US Department of Transportation. A
14 technical paper containing the condensed version of
15 this report has been accepted for publication in a peer 11:17
16 reviewed journal. I provide the citation for the
17 journal. It is already available on the journal's web
18 site and is expected to be in the printed journal some
19 time this spring. Thank you Mr. Inspector.

20 11:18
21 **END OF SUBMISSION**

22
23 **INSPECTOR:** Thank you Dr. Raj. It is
24 a quarter past 11. Does
25 that conclude your presentation? 11:18

26 **MR. O'NEILL:** That does conclude my
27 presentation. There was
28 one question raised by Mr. Robinson that hasn't been
29 answered yet, but I envisage it will be answered during

1 the course of the questions that are asked, and if not
2 we can deal with it at the end.

3 INSPECTOR: As I say, it is a quarter
4 past 11, we will take a
5 five minute break before we start questions. 11: 18

6
7 SHORT ADJOURNMENT

8
9
10 11: 32
11 THE HEARING RESUMED AS FOLLOWS AFTER THE SHORT
12 ADJOURNMENT

13
14 INSPECTOR: I am going to call now
15 for the questions to the 11: 34
16 Applicants. I see one had one, Catherine McMullin of
17 An Taisce.

18
19 THE APPLICANTS WITNESSES WERE CROSS-EXAMINED AS FOLLOWS
20 BY VARIOUS OBJECTORS 11: 34

21
22 MS. McMULLIN: Before asking questions
23 I would like to just maybe
24 make a few comments of things in the health and safety
25 field that have arisen over the course of this hearing. 11: 34
26 I am here representing An Taisce which is the National
27 Trust for Ireland which was set up to protect the
28 physical heritage of the Irish nation and we are
29 interested in the protection of the built and the

1 natural environment. You may say what has that got to
2 do with health and safety health, but of course health
3 and safety isn't there just to protect people and
4 property, it's also there to prevent damage to the
5 environment so in that sense I want to make some
6 comments. 11: 35

7
8 The first thing I would like to refer to is there was
9 claims earlier on that the rezoning was not carried out
10 in the proper manner. Now, I have taken some advice on 11: 35
11 this and I have been told that the rezoning as carried
12 out by Kerry County Council may have complied with the
13 Irish legislation, but that the original European
14 legislation could be interpreted as meaning that if it
15 was known that the site was going to have a Seveso 11: 35
16 Directive industry on it that then SCA should have been
17 carried out so this is perhaps something I could refer
18 back to An Bord Pleanála and to the Local Authority to
19 investigate if this should have been done in this
20 particular case. 11: 36

21
22 There were particular things I wanted to bring up. The
23 next one is the availability of the QRA. Again I have
24 been talking to the Applicants about this and the
25 impression seems to have been given that the QRA was 11: 36
26 not supposed to be on public display but to be given to
27 the Health and Safety Authority. I would dispute this
28 interpretation of it. I feel it is mentioned in the
29 EIS, but only very briefly, not in sufficient detail

1 that a member of the public could draw any conclusions
2 from it. I think while the Applicants themselves put
3 it on their website, this isn't really making it
4 available to the general public. There are people like
5 myself who don't have broadband and wouldn't be able to 11:37
6 download the file. There are people that who don't
7 have computers at all and who couldn't download it and
8 it was not put on display in the planning office. If
9 it had been there at least I could have gone and looked
10 at it, but when I checked it wasn't there. Perhaps for 11:37
11 future strategic infrastructure projects that it should
12 be considered that that should be put on display right
13 from the beginning. It would have been a great help to
14 me, if I had had it available I could certainly have
15 asked for advice from other more qualified people and 11:37
16 perhaps understood better what it was all about.

17
18 Since then we have had some excellent presentations
19 from the Applicants over the last couple of days which
20 have actually answered quite a lot of the questions 11:38
21 that I was going to raise on it anyway so I will just
22 go through a few other things. I didn't quite
23 understand, and maybe be one of the panel could clarify
24 for me, the QRA gave some very useful information on
25 the methane itself which was not available before and 11:38
26 which explained a lot of the problems that could arise
27 and how they could be dealt with and I learned that
28 cryogenic fluid, you have problems with burns to people
29 and it's an asphyxiant, but I would imagine both of

1 those would be just problems to the factory personnel,
2 not necessarily to the general public. There was a
3 mention in it if in the case of a catastrophic failure
4 of the tank in weather about the maximum downwind
5 distance to the lower flammable limit of 12.4 11: 39
6 kilometres -- well, there is two things I would like to
7 know. The first is in reaching the lower flammable
8 limit, when would it have reached the higher flammable
9 limit, would it be reached just after where the spill
10 took place or would it be further away? As a corollary 11: 39
11 to it, in the following section there is a lot of data
12 about the probability of ignition of this vapour cloud.
13 It is mentioned that once the cloud had reached two
14 kilometres the probability of ignition is essentially
15 zero because it would almost certainly have ignited 11: 40
16 before this point so perhaps if the Applicants should
17 clarify those points for me.

18 **MR. O'NEILL:** Perhaps before that
19 specific issue is dealt
20 with, if I could just deal with the first couple of 11: 40
21 issues that were raised. The first was the issue in
22 relation to the rezoning and the availability of the
23 QRA. In relation to the rezoning what has been said is
24 that, yes, the rezoning may well have complied with
25 Irish legislation, legislative provisions but perhaps 11: 40
26 not the EU provisions. The position is clear, from a
27 legal point of view Kerry County Council are obliged to
28 comply with Irish law. If the implementation of EU
29 directives by the Irish bodies do not conform with

1 those directives that doesn't absolve the County
2 Council of its obligation to comply with the Irish
3 legislation. Of course the issue of non-compliance is
4 something that can be taken up and of course normally
5 could be taken up by the Commission against the Member 11: 41
6 State in question, but unless and until the Irish
7 legislation regulations, whatever, are declared not to
8 be in compliance with the EU Directive they must be
9 regarded by the Local Authorities as being valid; in
10 other words, they are valid until struck down. 11: 41
11 The second issue relates to the availability of the QRA
12 and, yes, the observation that has been made is an
13 observation that has been made by a number of people.
14 The QRA, to put it in context, the QRA is not one of
15 the documents that in fact accompanies an application 11: 41
16 for planning permission. It's a document that emanates
17 from a request by the HSA to assist the HSA or to
18 inform the HSA in its investigation of health and
19 safety issues. The QRA was available, however, on the
20 website and I understand of course that not everyone 11: 42
21 has a computer and indeed even those that do have
22 computers did have difficulties in downloading the QRA.
23 Shannon LNG are sorry about that. There was, however,
24 and there is still and indeed now available copies.
25 There was available copies of the QRA in the Shannon 11: 42
26 offices, but again certainly there was no intention to
27 preclude people from having access to the QRA, anyone
28 who asked for a copy received one. Unless there is
29 another issue you want to raise in relation to that.

1 MS. McMULLIN: Just in relation to that.
2 No, your interpretation of
3 it is what mine would be too. It is also a project
4 that has been done under an EIS and again my
5 understanding is that the legislation dealing with 11: 43
6 Environmental Impact Statements and Environmental
7 Impact Assessment, the information has to be made
8 available to the public so I just wondered if maybe
9 that would have meant that it should have been put on
10 public display. 11: 43

11 MR. O'NEILL: The EIS has to be made
12 available and the
13 information in the EIS has to be made available, but
14 the QRA in fact is something separate, it's an
15 assessment for the HSA. 11: 43

16 MS. McMULLIN: Yes, but the information in
17 it, when I got it, it was
18 obvious to me that the information in it should
19 probably have been in the EIS as well. There are a few
20 pages in the EIS, but they are very brief and would not 11: 43
21 give one the full picture, that possibly a synopsis of
22 it in layman's language in the EIS would have been very
23 useful.

24 MR. O'NEILL: You are correct. In the
25 second volume I think of 11: 43
26 the EIS there is a synopsis of the QRA and of course in
27 volume 1 there is the layman's guide to the EIS, which
28 is obviously a shorter document and will obviously go
29 into less detail. There is a no doubt that the QRA is

1 a very technical document and difficult to summarise
2 I suspect in non-technical terms without losing the
3 import and impact of that document. We take your point
4 and if people want to have a look at that document,
5 whether or not they understand doesn't really matter, 11: 44
6 if they want to look at it, it was the intention of
7 Shannon to make it available and for that reason it was
8 on the website and if there were difficulties in
9 relation to obtaining copies we do apologise.

10 **MS. McMULLIN:** I don't think it's 11: 44
11 necessary to apologise
12 because I am not blaming Shannon LNG. I think it is
13 probably just the procedures need to be reconsidered
14 for future applications of this type.

15 **MR. O'NEILL:** Thank you. Now we will get 11: 44
16 to answer the meat of your
17 question in your to the health issue.

18 **MR. FRANKS:** Mr. Inspector, if I can
19 deal with the first point
20 raised about the 12.4 kilometre distance and what would 11: 45
21 have been the distance to the upper flammable limit.
22 This would have been somewhere between the edge of the
23 pool and the LFL, the lower flammable limit distance is
24 12.4 kilometres. We haven't actually extracted the
25 numerical value from the modelling results, but I can 11: 45
26 try and do that and perhaps feed that back to you if
27 you think that would be useful.

28 **MS. McMULLIN:** That's fine, the answer you
29 have given.

1 'what's the chance that before it gets this big the
2 cloud has actually already met an ignition source and,
3 therefore, ignited' and at a distance of two kilometres
4 the chance that the cloud has already ignited before it
5 gets that big is close to 1, as observed, which means 11: 47
6 that the chances of it going beyond that distance are
7 very, very low. I hope that addresses the question.

8 1 Q. **MS. McMULLIN:** Thank you. I have a couple
9 of other small points. One
10 was them about the contamination in the gases which we 11: 47
11 have discussed this morning. I had raised this
12 question already and what I would like to know is just
13 assurance from Shannon LNG that they will be ensuring
14 that whatever gases they import are checked beforehand
15 so that we don't have this problem of the hot gas as 11: 47
16 has been described.

17 A. **MR. BOWDOIN:** My name is Leon Bowdoin for
18 those of you who have
19 forgotten. Mr. Inspector, the answer to that question
20 is Shannon LNG will ensure that all gas that is 11: 48
21 delivered into the pipeline system will meet the Irish
22 specifications.

23 2 Q. **MS. McMULLIN:** Thank you. Now, another
24 one, again I am not sure
25 that I have got the picture correctly, we were talking 11: 48
26 this morning about the overflowing at the tanks or
27 there was mentioned yesterday, for instance in the
28 scenario where the LNG is being pumped from the boat to
29 the tanks, if the pump was not switched off at the

1 appropriate time what would happen in the tank, how far
2 up would it rise, where would it overflow from,
3 assuming the tank itself hasn't been damaged.

4 A. **MR. VINECOMBE:** Mr. Inspector, Ian
5 Vinecombe, for the record. 11: 49
6 The design of the filling protection system for the
7 storage tanks relies on a tiered approach to measuring
8 the level in the tank and then taking action based upon
9 the levels which are measured. What we do is we employ
10 redundant measurement systems, that is spared, 11: 49
11 backed-up measurement systems to ensure that a failure
12 of a single instrument won't render the system unsafe
13 so basically the level will rise as you are filling the
14 tank and you will be monitoring the level rising using
15 the available instrumentation. As you get to what we 11: 49
16 would call the design maximum level, the operators will
17 understand by virtue of their operating procedures that
18 the tank is full. As you approach that level there is
19 a high level alarm that will sound in the main control
20 system to indicate the level has been reached. Now, 11: 50
21 that high level alarm, as I said, will be read via two
22 discrete instruments so they will be functionally
23 independent. That's the point at which the operator
24 will then press the stop button and stop the unloading
25 of the ship. The action of stopping the unloading of 11: 50
26 the ship will trip the pumps on the ship to stop the
27 flow of liquid and again that system will be a
28 redundant system to ensure that a failure in the stop
29 signal cannot credibly occur. Above that system we

1 then have a trip system, what we call an automatic
2 shutdown system and this is part of the emergency
3 shutdown system on the terminal. Again functionally
4 independent instrumentation will read a level above the
5 alarm point and then that will take an automatic action 11:51
6 to shut down the ship pumps, close emergency shutdown
7 valves and that will stop the flow so that's how the
8 system works.

9
10 To answer the question that was raised what happens if 11:51
11 you physically overflow the liquid out of the inner
12 tank. In principle what would happen is obviously the
13 liquid would get to the top of the inner nickel tank
14 and would then flow out into the secondary containment
15 area, obviously something we don't want to happen, it's 11:51
16 not what the system is designed to do, but the
17 secondary containment would ensure there is no loss of
18 containment of either LNG or vapour.

19 **INSPECTOR:** Can I just clarify that.
20 Between the outer tank and 11:51
21 the inner tank there is insulation of perlite; is that
22 right?

23 **MR. VINECOMBE:** That's correct.

24 3 Q. **INSPECTOR:** The gap is fully filled
25 with perlite? 11:52

26 A. **MR. VINECOMBE:** That's correct. Basically
27 the insulation gap, which
28 is approximately a metre, is made up of effectively two
29 materials. The inner tank is wrapped in (indicating)

1 like a rock wool type blanket like you would have in
2 your loft insulation and then between that blanket and
3 the outer concrete wall, which will have a steel vapour
4 barrier liner on, which will perlite insulation which
5 is a fine powder type insulation, a high vapour space 11: 52
6 which is where the insulation properties come from so
7 it will be completely filled with solid material.

8 4 Q. **INSPECTOR:** If the inner tank overflows
9 into the outer tank surely
10 there is very little room, it is full of perlite? 11: 52

11 A. **MR. VINECOMBE:** The nature of the
12 insulation is like the
13 insulation in your loft at home or anywhere else, the
14 insulation is effectively air with a very fine
15 structure around it to trap that air and it's the air 11: 53
16 that is providing the insulation. The powder obviously
17 fills the space, but it has a high voidage as we would
18 call it so you will effectively fill that space up with
19 LNG and perlite if it overflowed.

20 **INSPECTOR:** Okay. 11: 53

21 5 Q. **MS. McMULLIN:** The Inspector has actually
22 asked the question I was
23 going to ask you, but what if it goes undetected so
24 long that it actually fills up that as well, what
25 happens then? 11: 53

26 A. **MR. VINECOMBE:** From the point of view of
27 whether that could happen
28 of course, we would consider this to be a non-credible
29 overflow event because of the protection systems which

1 are in place. I am certainly not an expert in working
2 out the probability failures of such systems, but under
3 the EN 1473 design code for the terminal we are
4 required to do a safety integrity level assessment of
5 all of the protection systems on the plant, it is 11:54
6 called SIL analysis and it's a requirement of the
7 European codes that we do that. That SIL analysis will
8 tell us the level of the integrity that these
9 instrumented systems need to have to ensure that the
10 risk of that overflow is reduced as low a practical a 11:54
11 level so that we can be assured that it becomes a
12 non-credible event.

13 6 Q. **INSPECTOR:** All of these systems are
14 dependent on an electricity
15 supply, if there is a complete power failure does the 11:54
16 whole system just shut down automatically?

17 A. **MR. VINECOMBE:** As with many other things
18 on the terminal design we
19 basically have a tiered approach to ensure that the
20 system is always available when it is required. 11:54
21 Basically that system works by using the normal power
22 supply initially. In the event that the normal power
23 supply is unavailable to the plant, which is a very
24 credible occurrence as you can imagine, basically we
25 then move to a mode of operation where we keep what we 11:55
26 call the essential services operational. Now, if we
27 lost main power to the plant we would basically shut
28 down the terminal operations in terms of the ship
29 unloading would be stopped. We would then rely on our

1 emergency power system which operates via a combination
2 of means. We essentially will have an emergency
3 generator which is diesel driven which will keep power
4 to essential services. The instrumentation systems
5 will generally be driven through what we could call an 11:55
6 UPS system, an uninterpreted power supply system which
7 is a battery backed-up system where the power is fed
8 into that system from the emergency generators. That
9 will ensure that the instrumentation is available for a
10 defined period of time and that will allow the safe 11:56
11 shutdown of the systems in the event that there is a
12 power failure. This is a very conventional approach to
13 shutdown design.

14 7 Q. **MS. McMULLIN:** I am still surprised,
15 though, that you haven't 11:56
16 looked, at least in theory, at a situation where what
17 we think is totally impossible should happen and that
18 the liquid should fill up to the top of the concrete
19 tank, what would happen then, if only so that if you
20 say the symptoms arising you would know this is what 11:56
21 had happened?

22 **MR. VINECOMBE:** Maybe Mr. Leon Bowdoin
23 would be better positioned
24 to answer this question.

25 A. **MR. BOWDOIN:** Mr. Inspector, a range of 11:56
26 things will be taking place
27 in the event that you overtop the inner tank. One of
28 the first things that will happen, in addition to all
29 of the alarming that is going in relation to the liquid

1 level being too high, is your tank pressure will begin
2 to rise and that in itself will trigger a set of
3 reactions and shutdowns that would stop the operation.
4 If that were continued to be allowed to happen through
5 some additional failure of the control systems then the 11:57
6 tank discretionary vent would be allowed to operate,
7 that is the warm vent. In addition, we also have a
8 cold discretionary vent on the tanks which would also
9 be allowed to operate and finally a triple redundancy
10 in the vapour system is the tank relief systems so 11:58
11 there are about seven or eight different systems that
12 would be all layered to be able to manage the event
13 should it occur. As Ian has said, as you postulate
14 what can happen it does become a very incredible event
15 that it is not detected, not reacted to and not 11:58
16 mitigated.

17 8 Q. **MS. McMULLIN:** Thank you very much.
18 I think that probably
19 covers what I was trying to get at. I have just one
20 other question for the moment and it's to do with 11:58
21 smoking on the site for workers. When I worked in the
22 chemical industry we never allowed anyone to smoke
23 within the periphery of the plant except in certain
24 designated areas which were the canteen and offices
25 which were sufficiently far away from hazard material 11:59
26 to be no problem. I was somewhat surprised when the
27 remark was made that they could smoke in the car park.
28 Now, I appreciate the legislation has changed, you can
29 no longer allow them to smoke in the offices or the

1 canteen and I just wondered how the industry is coping
2 with this situation?

3 A. **MR. BOWDOIN:** Mr. Inspector, there will
4 be no uncontrolled ignition
5 sources, whether that be smoking or any other device 11:59
6 allowed within the confines of the process parts of the
7 plant that are considered essential or part of the
8 process. There will be designated smoking areas as
9 required by the regulations of the Irish Government.
10 The car park area, which is a significant distance from 12:00
11 the process plant, will be located in an entirely safe
12 area so it will be outside of any ignition restriction
13 areas that we would have within the process part of the
14 plant. If one were to look at the layout drawings you
15 will notice that the car parking areas are outside of 12:00
16 the inner perimeter fence of the facility.

17 **MS. McMULLIN:** Thank you, Mr. Bowdoin.
18 I think that's all for the
19 moment, Mr. Inspector.

20 **INSPECTOR:** Thank you, Ms. McMullin. 12:00
21 Any other questions? Could
22 I have your name please.

23 9 Q. **MS. O' MAHONY:** My name is Lilly O' Mahony,
24 I am one of the residents
25 of Kilcolgan. I want to make reference there to the 12:01
26 evidence that was given earlier on page 15. This is
27 how it reads, it says:

28 "Many actions can be taken by a person
29 exposed to radiant heat from any fire
including running away from the fire,

1 hiding behind objects such as trees,
2 buildings or automobiles, running
3 inside a building and in some cases
4 even holding a newspaper or a sheet in
5 front of the face, if one is
6 available."

5 'If' is a very small word written on paper, but it has 12: 01
6 an awful lot to answer for. Now, my question is this:
7 My house is 912 metres away from the nearest proposed
8 storage tank, my son's house is 800 metres away from
9 the nearest proposed tank. I cannot run myself as
10 I had both of my knees replaced, I am lucky to be able 12: 01
11 to walk. What about the children who are not able to
12 walk, never mind run. In your opinion what is the
13 safest action for me, will I have to talk around with a
14 newspaper and I would like an answer in layman's
15 language please. 12: 02

16 A. **DR. RAJ:** Mr. Inspector, this is
17 Phani Raj. Let me qualify
18 that statement by saying that those are applicable when
19 you are exposed to 5 kW/m². It is my assessment from
20 the EIS and the QRA that the 5 kW/m² from any of the 12: 02
21 postulated scenarios does not extend that far, 912
22 metres and 800 metres. In fact the risk to the nearest
23 residence is one third of the maximum allowed by the
24 HSA. I would indicate that in these residence
25 locations you will not even feel the heat, let alone 5 12: 03
26 kW/m². As I indicated I have faced 5 kW/m² for 30
27 seconds in ordinary clothing and I am here to tell the
28 story live.

29 10 Q. **MR. McELLI GOTT:** Mr. Inspector, my name is

1 Johnny McElligott. Phani
2 Ray is Indian, I am bald and I am very fair skinned and
3 I spend about two minutes in the sunshine I will burn
4 like a tomato. Now, he says on page 3 on the addendum
5 to the statement of Phani Raj that he can attest to the 12: 03
6 fact that in the field tests with himself he received
7 neither a severe pain nor a skin burn nor blisters on
8 the skin, would that be the same case for me, if you
9 look at me now and you see what I look like?

10 A. DR. RAJ: Mr. Inspector, the short 12: 04
11 answer is yes. Because
12 I have looked at the medical literature on the
13 susceptibility of skins to infrared and it is well
14 known in the medical literature that skin colour that
15 sees invisible light has nothing to do with what one 12: 04
16 feels as heat and therefore whether I am Indian or any
17 person will feel the same amount of heat. As to the
18 sunlight most of the burn that people get from the
19 sunlight is because of ultraviolet, that is why we have
20 ultraviolet screening lotions that people put on when 12: 04
21 they go for sunbathing so it is not by the infrared
22 heat that one feels from the fire.

23 11 Q. MR. McELLI GOTT: My skin is also very
24 sensitive to cold so it's
25 not just the ultraviolet light, it's just the changes 12: 04
26 of temperature affects my skin as well, how would you
27 answer that?

28 A. DR. RAJ: Mr. Inspector, we are
29 talking here about

1 potential exposure to a fire. I have never experienced
2 a cold fire.

3 **INSPECTOR:** Catriona Griffin?

4 12 Q. **MS. GRIFFIN:** Catriona Griffin. Just
5 going back to something 12:05
6 Ms. McMullin mentioned a few minutes ago, like I said
7 earlier in a week I too could not download the QRA, but
8 I have noticed that since Monday the Shannon LNG
9 website is no longer attainable on the internet either.
10 Just going back to yesterday, something Mr. Eoghan 12:05
11 Lynch mentioned, it was in reference to a query by
12 submission L024, Mr. John Fox. He mentioned that ten
13 years is too long a period as ask the locals to endure
14 basically living around a construction site. Mr. Lynch
15 said that the duration of the first construction phase 12:06
16 will be approximately four years and then later on
17 there will be more construction, if necessary. I just
18 wonder, I remember seeing in the Shannon LNG brochures
19 something about at works jetty, am I correct?

20 A. **MR. LYNCH:** Yes, there is a marine 12:06
21 jetty in the application,
22 Mr. Inspector, a materials jetty I should say.

23 13 Q. **MS. GRIFFIN:** A materials jetty. Will
24 any of the materials or
25 equipment for construction will be coming in via sea? 12:06

26 A. **MR. LYNCH:** Mr. Inspector, we cannot
27 say at this stage if
28 material will be coming in by sea. We included a
29 materials jetty in the application to have the

1 provision so to do. This was something that will be
2 dependent on the contractor who would be constructing
3 the terminal. We want to have the facility to be able
4 to bring in materials by sea, but we carried out the
5 traffic analysis on the roads on the basis that we 12:06
6 would not be importing material using a materials
7 jetty.

8 14 Q. **MS. GRIFFIN:** As you appreciate from my
9 perspective I live on the
10 side of the main road so for me materials coming in by 12:07
11 sea would be a lot less intrusive than 170 odd trucks a
12 day doing past my house.

13 A. **MR. LYNCH:** Mr. Inspector, I appreciate
14 that point. As I say we
15 included in the application to have the provision. We 12:07
16 wanted to include everything in the planning
17 application at this stage, but it is something that we
18 cannot say that would happen until later on in the
19 project.

20 15 Q. **INSPECTOR:** Is there any likelihood, do 12:07
21 you think there is a real
22 likelihood that the materials would come in by the
23 jetty?

24 A. **MR. LYNCH:** There is a likelihood,
25 Mr. Inspector, but we 12:07
26 really don't know. It will depend on the contractor,
27 where the contractor is based, the materials, the
28 supply of the materials, the make-up of the materials.
29 It's not really until the detailed design is done and

1 the contractual arrangements are put in place that we
2 would know that.

3 16 Q. **MS. GRIFFIN:** I have just got another
4 question for Mr. Lynch, if
5 that's okay. On page 17 of Mr. Lynch's statement of 12: 08
6 evidence he mentions that the fence is being moved back
7 further into the site so as to impact less on the view
8 people have from their homes. He mentioned that there
9 had been new photomontages produced. I have actually
10 seen one of the montages and my understanding of it was 12: 08
11 that the ditch that is there at the moment is still on
12 the photomontages.

13 A. **MR. LYNCH:** Mr. Inspector, we created
14 photomontages for the
15 immediate neighbours to give the impression of the 12: 08
16 revised proposal for the fencing. Included in that we
17 are proposing to reinstate a sod and stone ditch with a
18 hedgerow, blackthorn or native species, but it would be
19 further back from its current position because the road
20 would be widened by Kerry County Council so the ditch 12: 09
21 would be replaced further away from where it is at the
22 moment.

23 **MS. GRIFFIN:** I just wanted to point out
24 that it doesn't give a
25 totally accurate picture. 12: 09

26 17 Q. **MS. O' MAHONY:** I would just like to say
27 that we were given those
28 pictures as well and when you look at those pictures,
29 the last ones that you gave us, Eoghan, our wall

1 actually looks like a kerb rather than a wall, it looks
2 like you would be looking from here into Listowel
3 rather than looking onto the site. They are at some
4 distance, where it came from I don't know, but they are
5 not at all what it looks like in reality. 12: 09

6 **INSPECTOR:** Mr. Lynch, will these
7 photomontages will shown
8 later in a later module?

9 A. **MR. LYNCH:** Certainly. Mr. Thomas
10 Burns will be addressing 12: 10
11 landscape and visual later on. In fact as part of his
12 presentation he will be explaining the method that was
13 used in the make-up of the photomontages to try and
14 explain what it is based upon and the perspectives that
15 were taken and certainly the photomontages will be 12: 10
16 available. These were photomontages, Mr. Inspector,
17 that was created further to the submission of the
18 planning application when we went back to discuss the
19 issue with the immediate neighbours.

20 **INSPECTOR:** They are photomontages 12: 10
21 that I have not seen and
22 I don't know whether other people have seen them
23 either, provided they are made available later.

24 **MR. LYNCH:** Absolutely.

25 **INSPECTOR:** Maybe that's the 12: 10
26 appropriate time to discuss
27 that.

28 **MS. O' MAHONY:** Mr. Inspector, would you
29 allow me to bring in my

1 photographs on Monday and show them to you.

2 **INSPECTOR:** Well, on Monday we are
3 doing the ecological
4 modul e.

5 **MS. O' MAHONY:** It's too far for me to go 12: 11
6 home and back now, you are
7 talking about 66 miles, it is 33 miles each way.

8 **INSPECTOR:** I am proposing that we
9 discuss that at a later
10 time anyway so probably Monday or even later. 12: 11

11 **MS. O' MAHONY:** Thank you.

12 **MR. LYNCH:** We have no problem printing
13 out the photomontages,
14 Mr. Inspector.

15 **INSPECTOR:** Okay. The gentlemen here 12: 11
16 in the middle.

17 18 Q. **MR. O' DONOVAN:** Mr. Inspector, my name is
18 Thomas O' Donovan, I did put
19 in a submission. I just wanted to ask some of the
20 panel over here from the LNG if they know the 12: 11
21 temperature of the water that will be brought in from
22 the Shannon as it exits this site. That would be one
23 of my questions because obviously it has been estimated
24 that 100 million gallons of water would be transferred
25 through the site for cooling purposes and for other 12: 12
26 purposes I am sure and that warming a pipe or an
27 installation of that low temperature would obviously
28 exit some water at a very, very low temperature so
29 I would just like to ask them what that would be?

1 **INSPECTOR:** I am not sure that that is

2 relevant to health and

3 safety, but if you can give a quick answer.

4 A. **MR. BOWDOIN:** The first point I would

5 like to make is the estuary 12: 12

6 water temperatures vary quite significantly with time

7 of year. The data that we have collected recently

8 shows the temperatures down as low as approximately 6°C

9 and I believe as high as 17°C and I will ask anybody to

10 correct me if my memory is faulty. There is great 12: 13

11 seasonal variation. I believe the minimum temperature

12 which we have used in our modelling, which includes

13 some excursion from normal temperatures, would be in

14 the winter where we would have a 6 or 7 degree

15 temperature, we would have a minimum temperature of 12: 13

16 zero or minus one degrees centigrade at maximum.

17 19 Q. **MR. O' DONOVAN:** Just briefly a follow-up

18 question. As this volume

19 of water would be transferred daily not alone would the

20 varying degrees of temperature, but also I would like 12: 14

21 to know the component as it exits. Obviously it is

22 clear water, pristine coming in and as it exits after

23 going through a process we are not fully sure of the

24 process. I want to know obviously does this change the

25 process and as it would exit I am aware that it's 12: 14

26 comprised of various chemicals which would be

27 detrimental to the area and the wildlife in the area,

28 I would just like a brief response to that please.

29 A. **MR. BOWDOIN:** Mr. Inspector, the quality

1 of the water will be
2 discussed in one of the next sessions so I will leave
3 it to those experts to talk about, but in just general
4 terms, with the exception of the hypochlorite
5 concentrations that we will be adding in very small 12: 15
6 concentrations, and again there is a very detailed
7 presentation planned on that subject and its influence
8 on the estuary, which is not significant, there is no
9 chemical change that takes place to the water. The
10 water is merely used as a heating source so there is 12: 15
11 some change in temperature but not in terms of chemical
12 composition other than the small amount of hypochlorite
13 added to it.

14 **INSPECTOR:** I think you will be getting
15 a more detailed answer on 12: 15
16 that later on.

17 **MR. O' DONOVAN:** Thank you, Mr. Inspector.

18 **INSPECTOR:** Ms. Griffin.

19 20 Q. **MS. GRIFFIN:** Catriona Griffin. I just
20 want to clarify a few 12: 16
21 things with Dr. Raj. On page 9, Dr. Raj, under the
22 section, 3.4.1 LNG storage tanks, you mention on the
23 last sentence:

24 "The tanks described are consistent
25 with accepted design parameters for 12: 16
26 full containment tanks."

27 I just wondered in your own personal opinion how would
28 you view the safety of in-ground or underground storage
29 tanks in comparison to overground storage tanks?

1 A. DR. RAJ: Mr. Inspector, I can only
2 speak from my experience,
3 I am not a constructor of LNG tanks or a designer of
4 LNG tanks, but there are a lot of considerations that
5 go into designing a tank, whether it is overground or 12: 16
6 underground or full containment, but the very concept
7 in my opinion of a full containment tank is nothing
8 comes out of it even under extraordinary circumstances.
9 As has been discussed before in these hearings about
10 the difficulties of underground tanks and the issue 12: 17
11 that one has to deal with in the design have been
12 discussed and I think I will leave it to the others to
13 explain that. In my opinion the full containment tank
14 as the name implies is to contain everything within
15 itself. 12: 17

16 21 Q. Thank you for that, Dr. Raj. I just wanted to ask you
17 another question on page 9, second paragraph, last
18 sentence, in the report it is written there:
19
20 "...the results of the QRA are
21 conservative." 12: 17

22 But when you were reading it out you said 'therefore
23 the results of the QRA are very conservative' so I just
24 wanted to clarify whether you meant conservative or
25 very conservative? 12: 18

26 A. Mr. Inspector my adjective 'very' is correct, I meant
27 it. If I had to do the QRA I would probably take more
28 realistic probabilities of certain things that
29 Dr. Franks has not included in the sense that he has

1 taken the worst situation possible to get the largest
2 area for this contours, if I had to do this calculation
3 I would not be as conservative as he is.

4 22 Q. Thank you for that. Just one more question, Dr. Raj.
5 On page 14, last paragraph, first sentence: "LNG 12: 18
6 liquid is neither reactive nor explosive". I have come
7 across an article in the American media regarding a
8 Rhode Island press coverage of a meeting regarding LNG
9 in 2005 and it mentions Mr. Gordon Shearer and it says
10 when Mr. Shearer was asked what would happen if an LNG 12: 19
11 storage tank failed he said:

12 "It would be the world's largest Roman
13 candle."

14
15 I just wanted some clarification on that remark. 12: 19

16 A. DR. RAJ: Mr. Inspector, I am not
17 aware of that code, I have
18 not read that particular press release, but Mr. Shearer
19 is here, if you want you can get clarifications from
20 him. 12: 19

21 INSPECTOR: Mr. Shearer, Roman candle?

22 MR. SHEARER: Mr. Inspector, that was a
23 quotation and direct
24 response to a question that was asked of 'what if the
25 roof of an LNG tank failed and it caught on fire' and 12: 19
26 as I think you have heard, and you can ask any one of
27 the specific technical experts here, the odds and
28 probability of that ever happening are extraordinarily
29 remote as to be non-credible events.

1 23 Q. **MS. GRIFFIN:** Okay, thank you,
2 Mr. Shearer, but just to
3 clarify did you or did you not say it would be the
4 world's largest Roman candle?
5 A. **MR. SHEARER:** I believe that's what 12: 20
6 I just confirmed so yes.
7 **MS. GRIFFIN:** Thank you.
8 **DR. RAJ:** Mr. Inspector, if I may
9 just offer a clarification
10 because Ms. Griffin is quoting from my presentation 12: 20
11 here. Indeed LNG by itself as a liquid is neither
12 explosive nor can it burn, it is the vapour. You have
13 to vaporise it and that is not even sufficient, you
14 have to vaporise it and mix it with air and then have
15 ignition and then only it will burn. 12: 20
16 24 Q. **MR. McELLI GOTT:** Dr. Raj, could you explain
17 what happened in the video
18 that Dr. Havens showed where we saw a mushroom cloud,
19 something that went up in the air, almost like a
20 Hiroshima type explosion, could you explain exactly 12: 21
21 what that was?
22 A. **DR. RAJ:** Mr. Inspector, if the
23 question is related to what
24 was the purpose of the experiment or what actually
25 happened, I would like to have clarification. 12: 21
26 25 Q. **MR. McELLI GOTT:** Could you explain what was
27 that, it looked like an
28 "explosion" to me when something went up in the air, a
29 big bang and you have a lot of cloud like a mushroom,

1 it was a Hiroshima type cloud, I am a lay person, you
2 are the expert, could you explain again what happened
3 in that video, could you walk us through it and just
4 explain in clarity what happened or we could show it to
5 you again if you would like? 12: 21

6 A. DR. RAJ: Mr. Inspector, I thank
7 Mr. McElligott for the
8 offer to show it, I have seen it many times so I don't
9 need to see it again. What actually happened is in
10 spite of the best efforts of the experimenters to 12: 22
11 prevent any ignition from happening this cloud ignited
12 and in fact that leads me to mention that's why I said
13 the QRA is very conservative because in the QRA the
14 immediate ignition probability is assumed to be 50% and
15 not 99.9% which is what I would have used in anything 12: 22
16 as you saw from the experimental film. What
17 Mr. McElligott I think is referring to is the way that
18 vapours burn. It was pure vapour on top of the surface
19 of the water and it did not have air and the only way
20 it can burn is to ingest air. When you have a very 12: 22
21 large high concentration vapour that is there it has to
22 ingest air and that's where the buoyancy lifts the
23 thing and it is burning. It is called a fire ball type
24 of burning and that is not uncommon. There was no
25 explosion, there was no pressure effects on everybody 12: 23
26 nearby it was just another form of burning.

27 INSPECTOR: It was not an explosion,
28 okay.

29 26 Q. MR. McELLI GOTT: Dr. Raj, is there anything

1 in Dr. Havens' testimony
2 that you would disagree with?

3 A. DR. RAJ: Well, not particularly.
4 I think he said all the
5 things that I have been saying for many, many years. 12: 23

6 27 Q. MR. McELLI GOTT: Just maybe a point to the
7 Inspector. The Killocolgan
8 Residents Association are asking that An Bord Pleanála
9 request that Shannon Development present An Bord
10 Pleanála with a complete Development Plan for the 12: 23
11 development of the entirety of the land bank to include
12 all proposed deep water port facilities in the aim of
13 creating large scale employment possibilities as per
14 the county and Local Development Plans so that this
15 project may be assessed in its overall context. This 12: 24
16 would be fully in keeping with sustainable and
17 integrated development objectives. This would also
18 require a new land based and marine based QRA.
19 Dr. Raj, you said you visited the site, did you take
20 into account when you visited the site and gave your 12: 24
21 expert opinion the future developments of this land
22 bank because what I am asking is that we need to know
23 the effects on a large scale employment land bank, not
24 just the greenfield site that it is at the moment?

25 A. DR. RAJ: Mr. Inspector, that was 12: 24
26 beyond the purview of my
27 contract with the attorneys, my work was only
28 technical.

29 MR. O'NEILL: Can I just give a

1 clarification there, Sir.
2 As you are well aware the application is for the
3 development identified in the application. What the
4 Applicant has done, and it's not part of the
5 application for planning permission, it has identified 12: 25
6 possible future developments, but obviously any
7 possible future development will be subject to an
8 application for planning permission and will be subject
9 as appropriate to EISs and to HSA vetting, but all the
10 Applicant is seeking in this application is permission 12: 25
11 to carry out the works the subject matter of the
12 application and nothing more.

13 **INSPECTOR:** Just to clarify that, you
14 are talking about the
15 possible power station, is that right? 12: 25

16 **MR. O'NEILL:** Yes, Sir, that's right.

17 **MR. McELLI GOTT:** We are talking about the
18 adjacent sites on the land
19 bank. What we are saying is that this has been
20 presented as just a terminal like I said before without 12: 26
21 going over the old ground, but if really we want to
22 develop the full lot of the land bank and bring lots of
23 industry and deep water port facilities how can you do
24 a QRA based solely on that single unit without taking
25 into account the other developments that it is supposed 12: 26
26 to entice into the area or what possible developments
27 would come into the area, Dr. Raj?

28 **MR. O'NEILL:** Perhaps I can answer that
29 because that's actually a

1 legal question. The planning regulations, the planning
2 Act and all the safety measures that have to be taken
3 are very clear. What has to be assessed is the
4 application for development, not some hypothetical
5 application that may or may not be made at some stage 12: 26
6 in the future. Indeed An Bord Pleanála's jurisdiction
7 is limited to considering the application in the
8 context of proper planning and sustainable development.
9 Let me finish please, Mr. McElligott. It cannot
10 speculate as to what subsequent applications for other 12: 27
11 lands, not under the control of this Applicant and
12 indeed in respect to which this Applicant would not in
13 any event be entitled to make an application, it cannot
14 speculate on future applications. Obviously in due
15 course any applications that are made by others for 12: 27
16 adjoining lands will be the subject of the planning
17 process, either through the planning authority or An
18 Bord Pleanála if appropriate.

19 **MR. McELLI GOTT:** I agree particularly with
20 you, Sir. In your planning 12: 27
21 application Ri a Lyden specifically referenced the
22 County Development Plan where this would encourage
23 other developments and uses of the land bank so the
24 Applicant themselves has already referred to how we
25 would encourage new development so that is why in my 12: 27
26 previous statement I ask, now that you have yourself
27 referenced the rest of the development of the land
28 bank, that this should be taken into account in the
29 interests of sustainable and integrated development

1 which is why I made the statement that we want Shannon
2 Development to present an overall Development Plan.
3 For instance, how can Shannon Development who own this
4 land pretend to us, the people of North Kerry, that
5 they have had some big plan for this. It is almost 12: 28
6 like they are say 'oh, nobody came to us over these
7 last few years, we are waiting, we are waiting', any
8 developer that owns a large plot of land should have a
9 Development Plan put forward and just because they are
10 sitting on cushy jobs, well paid, they have not 12: 28
11 presented anything viable for the whole area, they are
12 waiting for a developer to come in and do it and for me
13 it is unethical.

14 **MR. O'NEILL:** That perhaps is a criticism
15 directed towards Shannon 12: 28
16 Development, I am not going to answer for them, but we
17 have expressed the view, and indeed Kerry County
18 Council have expressed the view, that this development
19 will have a benefit in terms of attracting development
20 to the adjoining lands. That is our view, that is the 12: 29
21 view of Kerry County Council and to date other than
22 raised by way of questions there hasn't been any
23 evidence to suggest the contrary.

24 28 Q. **MR. McELLI GOTT:** Okay. Dr. Raj, in your
25 addendum to your statement 12: 29
26 in the first page, when referring to the accident in
27 Algeria's LNG liquefaction plant you say that the
28 Algeria LNG liquefaction facility that killed 27 and
29 injured 56 workers, no members of the public were

1 injured. If I understand correctly 56 workers were
2 interested, do Shannon LNG consider that workers have
3 to be treated differently to the general public and,
4 secondly, there is the Health and Safety and Welfare At
5 Work Act which says that we must protect people that 12: 30
6 are in the working environment and if the rest of the
7 land bank is supposed to be developed and encouraged
8 for large scale employment have you considered the
9 effects of an accident in the LNG terminal at Tarbert,
10 the effects it would have on the other large scale 12: 30
11 numbers of future employees that will be working on the
12 site and adjacent sites?

13 A. **MR. SHEARER:** I am going to speak to the
14 issue of health and safety
15 of employees. I will repeat, I don't have my testimony 12: 30
16 in front of me from the first day, but I will reiterate
17 what I said then. We are committed to the safety, the
18 health and the welfare of our employees, our
19 contractors and the communities in which we do
20 business, that's an absolute undertaking and it is 12: 30
21 fully disclosed in the corporate sustainability report
22 that is sitting on the table in the middle of the room
23 so I do not need to repeat that here again today.

24 29 Q. **MR. McELLI GOTT:** Dr. Raj, do you recommend
25 that there should be 12: 31
26 automatic drink and drug testing of staff and
27 psychological evaluation of people that are working in
28 an LNG terminal to take account of human error, could
29 that be taken into account as well?

1 A. DR. RAJ: Mr. Inspector, that is not
2 an area of expertise that
3 I have or have professed to that extent, that is not
4 for me to answer.

5 30 Q. MR. McELLI GOTT: Dr. Raj, I am not sure, 12: 31
6 maybe it was Dr. Andrew
7 Franks, they say that the chances of meeting an
8 ignition source on land is very high up to two
9 kilometres and what I am wondering is what are the
10 chances of meeting an ignition source over water 12: 31
11 considering that the LNG terminal is on the estuary and
12 if the wind blows the vapour clouds out along the
13 estuary what are the chances of meeting an ignition
14 source and the distances over water if there are very
15 few ships around? 12: 32

16 A. MR. FRANKS: Clearly if there are very
17 few ships around then the
18 chances of meeting an ignition source are lower, if
19 there are very few ships around. If there is a passing
20 vessel there would be obviously ignition sources 12: 32
21 present. Similarly if there are any passing fishing
22 vessels or leisure craft.

23 31 Q. Has that that LNG spill on water so been taken into
24 consideration?

25 A. The QRA has modelled LNG spills on to water from the 12: 32
26 unloading arms on the jetty and from the pipes on the
27 jetty back to land.

28 32 Q. What about a moving ship, if there is an accident or a
29 leak from the moving LNG container ship, does that

1 change?
2 A. The QRA does not address marine risks.
3 MR. McELLI GOTT: Thank you for clarifying
4 that.
5 INSPECTOR: Ms. O'Mahony, I think you 12: 33
6 want to ask a question.
7 33 Q. MS. O' MAHONY: I wanted to get back to the
8 area of the DVD that I saw
9 here on Wednesday. I know that Dr. Raj said that it
10 wasn't an explosion, but if it wasn't an explosion it 12: 33
11 was a fire, wasn't it?
12 A. DR. RAJ: Mr. Inspector, could I have
13 the question repeated,
14 I was a little sidetracked.
15 INSPECTOR: Could you put the question 12: 33
16 again.
17 34 Q. MS. O' MAHONY: The DVD that I saw on
18 Wednesday, you said there
19 just a few minutes ago it wasn't an explosion, but
20 wasn't it a fire, hasn't that as much importance as an 12: 33
21 explosion?
22 A. DR. RAJ: First of all,
23 Mr. Inspector, I would like
24 to point out that we did not have any sound in the
25 film. Had there been sound, in fact I have heard this, 12: 33
26 there is no hiss even let alone an explosion so it was
27 not an explosion. Yes, there was a fire, we all saw
28 that on the video so I don't know what the question
29 implies.

1 35 Q. Does that mean just because it wasn't an explosion that
2 the fire was just as important as the explosion, if a
3 fire occurred instead of an explosion wouldn't it still
4 do harm, do you understand the question?

5 A. Mr. Inspector, yes, I do understand the question. 12: 34
6 I think the concept of the fire and its effects have
7 been taken into consideration in the safety assessment.

8 36 Q. But you have seem to dismiss that it wasn't an
9 explosion, but you didn't dismiss that it was a fire?

10 A. I am not sure I understand the question, Mr. Inspector. 12: 34

11 **INSPECTOR:** I think he is accepting
12 that there was a fire.

13 **MS. O' MAHONY:** But he seemed to dismiss
14 the part that it was an
15 explosion, but he didn't dismiss the fact that it was 12: 34
16 an actual fire as well.

17 **INSPECTOR:** He is not disputing the
18 fact that there was a fire.

19 **MS. O' MAHONY:** That is as important.

20 **INSPECTOR:** He is drawing a distinction 12: 35
21 between the effect of a
22 fire and the effect of an explosion.

23 **MS. O' MAHONY:** The effect of the fire is
24 very much important as well
25 if you are living near it with the threat of it. 12: 35

26 **DR. RAJ:** Mr. Inspector, I never
27 claimed that the fire is
28 not hazardous. I think I have said repeatedly that the
29 safety assessments have taken into consideration the

1 effects of fire.

2 **MS. O' MAHONY:** Thank you.

3 37 Q. **MR. McELLI GOTT:** Dr. Raj, in your testimony
4 you speak of currently
5 there are 60 large LNG regasi fication terminals and 12: 35
6 over 170 new terminals proposed, I take it that that is
7 worldwide. Now, in your experience would you consider
8 that such a rapid expansion of the LNG industry is
9 increasing the chances of an accident happening in the
10 future? 12: 36

11 A. **DR. RAJ:** Mr. Inspector, I think that
12 is a very speculative
13 statement in my opinion because the LNG industry is the
14 most regulated, highly inspected, extremely well run
15 industry. In my 30 years of experience of dealing with 12: 36
16 the industry and the regulators so to expect that just
17 because the number of them increases they are going to
18 be less audited and less subject to regulation is not
19 correct.

20 38 Q. **MR. McELLI GOTT:** Dr. Raj, on page 8 of 19 in 12: 36
21 your testimony, the last
22 paragraph:

23
24 "The terraced topography of the
25 proposed site provides additional
26 safety against the effects of any
27 potential releases at the jetty or from 12: 36
28 storage tanks. Any vapour clouds
29 resulting from postulated potential
releases would have difficulty in
dispersing into the southerly direction
because of the very steep upslope
topography in this direction. It is
noted that the nearest residences are
located in this direction."

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What I would like to ask you, for instance Tom O' Connor and Michael O' Connor in Ardmore, they are east of this site, would you consider, therefore, that they are more in danger and that the rest of the land bank is to the west of this proposed site, Catriona Griffin is to the south so they are probably safer, but are the people to the east and the west more in danger then in your opinion?

12: 37

A. **DR. RAJ:** Mr. Inspector, in looking at the site and going as far as the jetty, and we are concerned only with the jetty releases, and I want also to direct your attention to the fact that Dr. Havens clearly stated, and I agree with him very well, that the LNG vapour if it gets released is heavier than air and tends, therefore, to hug the ground and disperse. When it encounters a barrier like a hill it doesn't go up the hill, it goes sideways, so to that extent the vapour cloud effects probably are going to be limited to the shoreline even though the QRA ignores this and assumes that the vapour cloud can go in all directions with equal facility.

12: 37

12: 38

12: 38

39 Q. **MR. McELLI GOTT:** Okay. For wind direction then, would the wind be more likely -- since the wind usually comes from the west towards the east, would the vapour clouds be more likely to go east or west then, would that make any difference?

12: 38

1 A. DR. RAJ: Mr. Inspector, I think
2 those have been carefully
3 taken into account in the QRA without consideration of
4 the topography. If the topography is included, the
5 fact that the topography actually rises from the water 12: 39
6 level to everywhere else would make the cloud not go
7 that far and we have seen from the results of
8 Dr. Franks' work that none of the residences are in any
9 danger within the purview of HSA's criteria.

10 40 Q. Dr. Franks [sic], thank you, but you did state that any 12: 39
11 potential releases would have difficulty in dispersing
12 in the southerly direction so when you say that you
13 must have an idea of where the cloud is more likely to
14 go and I would like you to clarify for people just to
15 know in which direction, therefore, would it be more 12: 39
16 easily or more likely or have less difficulty in going,
17 which is the easiest route for that cloud to go?

18 A. Mr. Inspector, I do not have the contour plots for the
19 proposed site and my guess is all of those wind
20 direction effects have been considered in the QRA with 12: 40
21 their probabilities and, therefore, anything I say is
22 only to say that the QRA is more conservative than it
23 actually should have been if exact information was
24 taken into account.

25 41 Q. Okay, Dr. Raj. From what you have just said there in 12: 40
26 your page 8 we can just assume, without asking you to
27 speculate on other things, I would just like you to
28 confirm that those that are in the south are in the
29 least zone of danger; is that correct?

1 A. Based on what I am talking about, Mr. Inspector, in
2 this particular paragraph reference to vapour only,
3 vapour dispersion, yes, that is correct.

4 **MR. McELLI GOTT:** Thank you, Doctor.

5 **INSPECTOR:** Ms. Griffi n. 12: 41

6 42 Q. **MS. GRI FFIN:** Catri ona Griffi n. Just to
7 point out about Dr. Raj and
8 Dr. Havens saying that gas vapour clouds are denser
9 than air and tend to stay closer to the ground, I know
10 from my own experience that the first couple of visits 12: 41
11 we had from representatives of Shannon LNG that their
12 big selling point, if you like, was that the gas escape
13 -- because a lot of people at the time asked that
14 question, if the gas escaped what would happen and we
15 were told that it was lighter than air and it would 12: 41
16 disperse. That is also highlighted in the earlier
17 brochures proved by Shannon LNG.

18

19 I have got just a few questions for Mr. Lynch. On page
20 5 you mention the hydrotest, that sea water would be 12: 41
21 used for doing the hydrotest; is that correct?

22 A. **MR. LYNCH:** Sorry, could you repeat the
23 questi on agai n.

24 43 Q. Page 5, last paragraph of your statement, you mentioned
25 that sea water would be used to do the hydrotest of the 12: 42
26 tanks; is that correct?

27 A. No, Mr. Inspector, we do not propose to use sea water
28 for the hydrotest.

29 **INSPECTOR:** That is not said in your

1 report, is it?
2 **MR. LYNCH:** No. It is presented as one
3 of the options that was
4 considered, but it was discounted because we propose to
5 use water from the pond for hydrotest. 12: 42
6 44 Q. **MS. GRIFFIN:** On the subject of the pond,
7 the pond will be initially
8 filled by the steam when there is a good flow, is that
9 going to be the main source of water for the site from
10 the pond? 12: 42
11 A. The main requirement, Mr. Inspector, for the pond is to
12 satisfy the large requirement of volumes of water for
13 the hydrotest and also it would provide a source of
14 fire water during the operation of the facility.
15 45 Q. Because I have walked that land bank during the summer 12: 43
16 and even in Irish summer where you have plenty of rain,
17 if we go through a period of a few dry days the level
18 of water in the stream and the pond is practically
19 non-existent?
20 A. Well, Mr. Inspector, we are allowing for two seasons to 12: 43
21 fill the pond, but it is possible that it could be
22 filled quicker.
23 46 Q. **MS. GRIFFIN:** Thank you. Sorry, I have
24 got one other question to
25 the gentleman to your right, Ian, I can't your name. 12: 43
26 You mentioned that in the event of a power cut that
27 there is a back-up system for the electricity, I think
28 batteries and a diesel generator were mentioned, how
29 long would they last, if you know what I mean?

1 A. MR. VINECOMBE: Mr. Inspector, the length
2 of time that they last will
3 obviously be a decision that Shannon LNG will make for
4 commercial reasons. In terms of what is essential,
5 which is what I am most concerned with as designer of 12: 44
6 the facility, is you need to have sufficient
7 electricity available to ensure that the plant is
8 maintained in a safe condition so I will have to refer
9 to Mr. Leon Bowdoin ... (INTERJECTION)

10 MS. GRIFFIN: Sorry. My understanding is 12: 44
11 during the winter time
12 especially when there is bad weather, we often have a
13 power cut that could last more than 24 hours, I just
14 wonder would it cover that period of time.

15 MR. BOWDOIN: The diesel back-up system 12: 44
16 has been specified in our
17 design documents as having a minimum of one week's
18 supply of fuel and that period of time was chosen so
19 that if we needed more fuel we could arrange for more
20 fuel to be delivered and continue on without a 12: 45
21 restriction in time.

22 MS. GRIFFIN: Thank you.

23 47 Q. MR. McELLI GOTT: Just to ask another
24 question about the water.
25 Tom O'Connor and his wife Kathleen who were here 12: 45
26 yesterday from Ardmore, they have their own water
27 source in their own house and that comes from
28 underground, they say that that water source will be
29 coming from where the site is about one mile all around

1 so if you are going to be doing construction works on
2 the site are you not taking away their water source?

3 A. **MR. LYNCH:** Mr. Inspector, we have
4 addressed this issue in the
5 EIS in that we have said that we would liaise with the 12: 45
6 neighbours to the site and monitor their water supply
7 and if it is considered that we are having any effect
8 on their water supply that Shannon LNG would be
9 prepared to discuss with them the provision of an
10 alternative supply. 12: 46

11 48 Q. **MR. McELLI GOTT:** Would you provide that for
12 free considering you would
13 have taken away their water supply?

14 A. **MR. LYNCH:** Mr. Inspector, I am afraid
15 I couldn't commitment on 12: 46
16 behalf of Shannon LNG in that respect, I would have to
17 confer with Shannon LNG.

18 49 Q. If they are not paying for anything at the moment, you
19 would be taking something away from them.

20 A. I am afraid, Mr. Inspector, I would have to confer with 12: 46
21 Shannon LNG on that matter, but we would certainly
22 enter into discussions for the provision of an
23 alternative supply.

24 **MS. GRIFFIN:** The majority of people in
25 that area, including 12: 46
26 myself, have our own well, from our own water supply so
27 this could be a big problem.

28 **MR. BOWDOIN:** Mr. Inspector, let me
29 follow up on that question,

1 if I could. My name is Leon Bowdoin again. If Shannon
2 LNG interrupts the water supply of any of our
3 neighbours we will replace their water and they will
4 not have to incur any costs.

5 **MS. GRIFFIN:** Are we going to have that 12: 47
6 in writing?

7 **MR. BOWDOIN:** I assume there will be a
8 transcript of this hearing
9 that they would be able to use, but I am sure if they
10 contact Michael Biggane he can give them all the 12: 47
11 assurances that they would need, whether it be in
12 writing or verbally or whatever it is they would
13 require.

14 50 Q. **MR. McELLI GOTT:** What about contamination of
15 the underground water 12: 47
16 supply, if it is contaminated?

17 A. **MR. BOWDOIN:** Mr. Inspector, I do not
18 want to foresee
19 contamination of the water supply by any activity that
20 we would be undertaking. I would point out that there 12: 48
21 is an expert coming up in a later session that will be
22 addressing issues of ground water.

23 **MR. McELLI GOTT:** No, but you have just said
24 that if you interrupt our
25 water supply you will compensate us so that means 12: 48
26 complete compensation, but if your construction works,
27 and there is chemicals and everything flowing around,
28 for the safety of people, if their water supply -- it's
29 not a hypothetical question, but if the water supply is

1 contaminated and, therefore, posing a safety risk to
2 the residents will you compensate them as well for full
3 ...

4 **MR. O'NEILL:** Can I answer that, Sir,
5 Hugh O'Neill. The position 12: 48
6 is, and I can speak on behalf of Shannon LNG in this
7 regard, if an established water supply is interfered
8 with; in other words, cut off or contaminated as a
9 result of activities on behalf of Shannon LNG, Shannon
10 LNG will resolve that issue. Whether or not they pay 12: 49
11 compensation over and above the remediating the
12 position is of course something that has to be assessed
13 on a case by case basis, no commitment to pay
14 compensation can be given in circumstances where the
15 loss if any is not even quantified at this stage. 12: 49

16 **MS. GRIFFIN:** You have got farmers in the
17 area who use a huge amount
18 of water for cattle, what happens if the water is cut
19 off, how long is it going to take to be reinstated, you
20 cannot expect cattle to do without water for a couple 12: 49
21 of days.

22 **MR. O'NEILL:** I can't address that issue
23 obviously, but what I have
24 said and what Mr. Bowdoin has said is that if the water
25 supply is interfered with, an established water supply 12: 49
26 is interfered with as a result of activities by or on
27 behalf of Shannon LNG, Shannon LNG will actually
28 legally have to deal with that. Let me finish please,
29 Mr. McElligott. They will have to legally deal with

1 that, but in any event they are clarifying the position
2 saying 'they will deal with it'. I can put it no
3 further than that. Obviously if there is an issue
4 arising for compensation, that is something that has to
5 be looked at. Clearly no-one is going to give a 12: 50
6 compensate without limit at this stage in circumstances
7 where the event hasn't occurred and the consequence of
8 that improbable event are not identified.

9 **MR. McELLI GOTT:** Your previous speaker said
10 that he would guarantee the 12: 50
11 water supply and compensate for it so you are now
12 saying something different to the previous speaker.

13 **MR. O' NEI LL:** Not really, no. The
14 question asked was 'if the
15 water supply was halted what would happen'. If it is 12: 50
16 halted the supply cannot be guaranteed. What would be
17 an alternative supply would be provided or the supply
18 that was previous enjoyed by the person in question
19 would be resumed.

20 **MR. McELLI GOTT:** Yes, but ... (INTERJECTION) 12: 51

21 **I NSPECTOR:** Mr. O'Neil l, would there be
22 a baseline study of
23 surrounding wells before development started?

24 **MR. O' NEI LL:** I will have to ask somebody
25 else to answer that 12: 51
26 question and it may be in fact -- these are issues that
27 are coming in, I know there are concerns that the
28 members here have, but there are perhaps issues that
29 are properly addressed during a later stage, the

1 ecology stage I would have thought. I can't answer
2 that specific question, Sir.

3 **MR. McELLI GOTT:** No, Mr. Inspector, the
4 previous speaker said he
5 would guarantee the water supply. For us that means if 12: 51
6 there is a problem with the water you are going to have
7 to give us that water for free because that's just what
8 the previous speaker said and now you with your legal
9 jargon, you are saying 'oh, if, if', but the previous
10 speaker said he will guarantee it and if it is 12: 51
11 contaminated you have to guarantee it.

12 **MR. O' NEI LL:** I can understand the need
13 for the question.

14 Mr. McElligott's water supply is not going to be
15 interfered with in Listowel. Anyone's water supply 12: 52
16 which is interfered with, and it is a big 'if' because
17 it's not believed that that will happen, but if it does
18 happen, and let's assume it does happen, an alternative
19 supply will be provided or the original source will be
20 restored. 12: 52

21 **I NSPECTOR:** Okay, Mr. McElligott.

22 I think the front table has
23 been hogging this rather too long. I see a questioner
24 in the second row.

25 **MR. O' DONOVAN:** Just to briefly add on a 12: 52
26 little bit about the water.

27 We are very lucky in Tarbert village and the
28 surrounding townlands and areas to be serviced by a
29 good drinking water and it has always been there for

1 us. As the country has experienced few and fewer areas
2 of quality drinking report, which has been reported in
3 the papers and so forth, and as global heating is
4 probably going to kick in, you will have drier and more
5 sunnier summers and wetter winters there could be 12: 53
6 periods where the water supply would not be sustained
7 on a daily or a weekly basis and as is proposed for
8 this huge development it would take up a lot of water,
9 I am not sure of the quantity, but I am sure it would
10 take up a lot which would be after being used 12: 53
11 contaminated, it would be useless for drinking anymore.
12 Now, the thing is we would be very concerned, and this
13 is why I put in a submission so that I could bring my
14 concerns to the Board, I am not against anybody or for
15 anybody, but I bring my concerns and my concerns are 12: 53
16 that if that water supply is exhausted or interfered
17 with back in the Kilcolgan area I do believe that if
18 planning permission were permitted they would tap into
19 our pristine water supply. There is people even come
20 from Listowel and several areas to get buckets of water 12: 54
21 from the tap in Tarbert because it is so good so I want
22 that put on the record, it is a concern of mine. Thank
23 you very much, Mr. Inspector.

24 **INSPECTOR:** I think in general you are
25 going to come to water 12: 54
26 supply and hydrogeology in a later module; is that
27 right?

28 **MR. O'NEILL:** That's correct, Sir. In
29 fact the question you asked

1 whether or not a survey of existing water supplies will
2 be undertaken the answer is, yes, it will, but the
3 details of that will be provided in the later module.

4 **INSPECTOR:** Okay. Mr. Fox.

5 51 Q. **MR. FOX:** Mr. Inspector, John Fox, 12: 55
6 Tarbert Development. As we
7 live down wind, as we would describe it, Tarbert
8 village is down wind of the plant, I want to go back to
9 something Dr. Raj said because I am not clear about the
10 fire situation. We saw very clearly on Wednesday with 12: 55
11 Dr. Havens that there was a fire under test conditions
12 without the introduction of an ignition source where
13 the vapour did go on fire, to my eyes there was many
14 explosions, but the whole test bed was engulfed in
15 flames, that was clear. My concern is this: If you 12: 55
16 have a leak on site and if it drifts towards the
17 village of Tarbert, clearly on a summer's day, a
18 temperature of 25 degrees, it is possible that the
19 vapour will rise, will mix with air and get into what
20 I think Dr. Raj described as stoichiometric conditions, 12: 55
21 if it hits or comes into contact with an ordinary
22 domestic overhead line, 220 volts, is there the danger
23 of ignition? Remember the overhead lines, ordinary
24 domestic supplies, can be going into the neighbouring
25 houses next door or adjacent to the site. 12: 56

26 A. **DR. RAJ:** Mr. Inspector, I will
27 try to answer, but I think
28 I may also need some help from Dr. Franks about this.
29 The question was, and I hope I understood the question

1 right, if the cloud drifts, if there is no ignition at
2 the source and if there is a vapour cloud that drifts
3 towards Tarbert and the temperature is 25 degrees
4 Celsius in the atmosphere will the cloud rise and then
5 somehow hit the overhead power lines and be ignited? 12: 57
6 I assume that that is my correct interpretation of the
7 question.
8 **MR. FOX:** (NODS)
9 A. The answer to that is no because even in the
10 temperature of the air is 25 degrees Celsius the cloud 12: 57
11 does not arise because the cloud starts at minus 160
12 degrees Celsius and as it mixes with air and becomes
13 higher in temperature but always lower than the air
14 temperature. Second, based on the experiments that
15 I have witnessed in the desert where the temperatures 12: 57
16 are much higher than 25 degrees Celsius we did not see
17 the cloud rise. Third, do overhead pylons as I have
18 observed, and I can only guess the height of that,
19 I don't have the exact number, but it is probably more
20 like 30 or 40 feet or 10 to 15 metres then I don't 12: 57
21 think the cloud will be flammable at that height,
22 that's my best guess, Sir, even if the cloud drifts
23 towards a pylon and the high tension wires.
24 52 Q. **INSPECTOR:** It will be flammable?
25 A. **DR. RAJ:** No, it will not be. It 12: 58
26 will not be flammable at
27 the height where the wires are.
28 **INSPECTOR:** Okay.
29 53 Q. **MR. FOX:** Mr. Inspector, if I may,

1 I was speaking more about
2 the normal domestic supply on the timber poles that you
3 and I would see out in the countryside, not the pylons.
4 I accept what Dr. Raj is saying about the height of the
5 pylons, but I am talking about the domestic supply, the 12: 58
6 neighbour houses around that area, ordinary supply?

7 A. **DR. RAJ:** Mr. Inspector, the answer
8 is yes. They have been
9 taken into consideration by Dr. Franks' analysis in the
10 QRA where he has looked at different ignition sources 12: 58
11 for the types of surroundings that are there, urban,
12 rural and so on where there is established densities of
13 ignition sources that have been provided and so those
14 ignition sources have been taken into consideration in
15 the QRA. 12: 59

16 54 Q. **MR. FOX:** Mr. Inspector, may
17 I address a question to
18 Mr. Vinecombe, if I may please. In his particular
19 documentation or evidence to the tribunal he made no
20 mention of the electrical supplies being underground or 12: 59
21 overground, would you like to clarify that please, on
22 site electrical supplies?

23 A. **MR. VINECOMBE:** Mr. Inspector, I am afraid
24 I need to pass this to
25 Mr. Bowdoin. From my position as a designer I am 12: 59
26 capable of putting power cables above or below ground.
27 Mr. Bowdoin as the developer, if you like, is better
28 placed to speak on why a developer would choose for
29 them to be above or below ground.

1 **MR. BOWDOIN:** Mr. Inspector, I think on
2 the particular project we
3 are talking about there will be both above ground and
4 below ground wires. For the most part the wiring will
5 be run in cable trays adjacent to the equipment and 13:00
6 connecting from one piece of equipment to the other and
7 so if you were to go back and look at the drawings that
8 we have shown, we have actually shown the pipe racks or
9 what we call pipe racks on that which would also
10 include the cable trays so within the majority of the 13:00
11 process part of the plant the wiring would be on cable
12 trays. Going from one part of the plant to another
13 part of the plant they may be either above ground or
14 under ground, no final decision has been made in that
15 regard as those types of decisions are typically made 13:01
16 at the detailed design phase, but I can say that there
17 are cases where they would by preference be put
18 underground rather than overhead, but it is pretty hard
19 to be much more specific since we haven't got through
20 the detailed design phase. 13:01

21 55 Q. I presume from that answer that we are talking about
22 running more or less parallel to the pipes within the
23 plant that will be above ground supplying motors and
24 the like rather than high up, 10/20 feet, (indicating)
25 that's what I am talking about, that height? 13:01

26 A. **MR. BOWDOIN:** The electrical systems that
27 are running on the cable
28 trays are typically the ones that are going to be on
29 the interior parts of the plant inside. Outside of the

1 process part of the plant we have not made any decision
2 whether those will be above ground or under ground at
3 this time.

4 56 Q. Is it too early to comment on the supply from the
5 proposed or planned, shall we say, or intended power 13: 02
6 station, is it too early to comment on that because
7 that will be high voltage stuff?

8 A. The process layout identifies the location where the
9 main substation will be located on the site. How it
10 gets to that location is subject to that planning 13: 02
11 application.

12 57 Q. **MR. FOX:** That's okay. I would just
13 say that we will be
14 watching that with some interest. Can I ask just two
15 related points and I am finished then, Mr. Inspector, 13: 02
16 please. In Mr. Vinecombe's presentation he made no
17 reference to local employment whereas Mr. Leon, as
18 I know him, I am sorry, this last gentleman, he made a
19 reference to the employment, how many jobs would be
20 involved, Mr. Vinecombe didn't do that, I presume it 13: 03
21 was an oversight as part of his brief and I just wanted
22 confirmation as regards to the numbers and your policy
23 statement in relation to the employment of local
24 people.

25 13: 03
26 I have one other related matter if I may please,
27 Mr. Inspector. How do you propose to manage the
28 employment policy and trade unions and that type of
29 thing?

1 A. MR. BOWDOIN: Mr. Inspector, Michael
2 Biggane will be speaking
3 later to those very subjects and I would propose that
4 we defer the answer to those questions until he makes
5 his testimony. 13:03

6 INSPECTOR: Okay. It's one o'clock now
7 so maybe we should break
8 for lunch. Mr. Kearney, one final question.

9 58 Q. MR. KEARNEY: I just have one question 13:04
10 there for Dr. Raj. In your
11 experience of LNG applications in the USA is it common
12 place to not conduct marine based QRAs that includes
13 LNG spills on water?

14 A. DR. RAJ: Mr. Inspector, this is 13:04
15 Phani Raj. There is no
16 regulation in the United States for water spills
17 period. There is no department for conducting a QRA.
18 However, the US Coast Guard requires a waterway safety
19 assessment to be done and that is risk based, it is not
20 a quantitative risk based. 13:04

21 59 Q. MR. KEARNEY: Sorry, in your professional
22 opinion, Dr. Raj, would you
23 recommend such a risk assessment be conducted?

24 A. Mr. Inspector, that is bordering on policy issues in
25 different nations and different jurisdictions and 13:05
26 I don't think I want to express an opinion on that.

27 INSPECTOR: Okay. We will break for
28 lunch. When we come back
29 from lunch, I think we have probably gone as far as we

1 have on the health and safety issue and I was going to
2 propose that we would move on to other planning matters
3 so if we could be back by, say, five past two please.
4

5 13:05
6

7
8 (LUNCHEON ADJOURNMENT)
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1 THE HEARING RESUMED, AS FOLLOWS, AFTER THE LUNCHEON
2 ADJOURNMENT

3
4 **INSPECTOR:** Good afternoon everybody.

5 If people could resume 14: 13
6 their seats please. Now, this afternoon I was hoping
7 to start on the next module, which is other planning
8 matters, including visual impact, roads and traffic,
9 noise, vibrations, dust etc., but excluding ecology,
10 that's because we are doing ecology on Monday. 14: 13

11 **MR. SHEEHY:** Mr. Inspector, there is
12 one very short point, if
13 you wouldn't mind, just a clarification item really at
14 this stage, on Andrew's presentation.

15 **INSPECTOR:** Okay, Mr. Sheehy, you have 14: 14
16 been very quite today so I
17 suppose we can accommodate you for the moment.

18 **MR. SHEEHY:** It is just to request
19 clarification on Table 2.2
20 on Dr. Franks' presentation. It is in relation to the 14: 14
21 inner, middle and outer zones, this is table 2.2 in the
22 Acceptable Land Uses. The items raised in table 2.2, I
23 just want to clarify that I am correct in this, these
24 are the acceptable uses for where there is an
25 established activity and page 324 of the EIS, where the 14: 15
26 HSA established criteria for new establishments that
27 the nearest property should be outside zone 2. Just
28 the clarify, am I correct in thinking that once a
29 permission is granted, if permission is granted, for

1 this development that it becomes an established
2 development and the criteria of table 2.2 will then
3 apply.

4 **DR. FRANKS:** Mr. Inspector, that's my
5 understanding of the HSA 14: 15
6 policy, yes.

7 **MR. SHEEHY:** Yes, that's the
8 clarification.

9 **INSPECTOR:** That's it. Thank you,
10 Mr. Sheehy. Before we just 14: 15
11 start this module I just want to point out that we have
12 had a number of requests from people if we could break
13 a bit early today, I don't know what it is about, if it
14 is a sports fixture or what, or whether it is just
15 because it is Friday, but I propose that we stop at 14: 15
16 5:30 today.

17
18 Now, on other planning matters, I am going to invite
19 the audience to speak first again. I think in this
20 instance I will call on Catherine McMullin of the Kerry 14: 16
21 branch of An Taisce. I see you have a number of other
22 issues, other than just the health and safety.

23
24 **MS. McMULLIN PRESENTED HER SUBMISSION, AS FOLLOWS:**

25 14: 16
26 **MS. McMULLIN:** Thank you. Well, the other
27 issues were mainly relating
28 to amenity. Visual amenity has been a problem for us.
29 The main problem is, obviously, the storage tanks and I

1 have no doubt many others have been of the same. When
2 the site was rezoned for industrial most industrial
3 buildings would probably have been quite acceptable
4 visually on that site, because they tend to look like
5 farm buildings or existing structures, but in the 14: 17
6 photomontages we have been shown four huge white tanks
7 dominating the landscape and certainly close by and we
8 identify in our submission the ones we found most
9 worrying. And even from places as far away as
10 Carrickfoyle Castle they can be seen. Carrickfoyle 14: 17
11 Castle is, obviously, a tourist amenity and quite a lot
12 of visitors go there. I noticed, too, that Clare
13 County Council also took issue with this whole visual
14 effect from their side of the river.

15
16 I don't know what can be done to modify that visual
17 effect and it is, perhaps, something that we will be
18 told about later in the day. I gather that there is
19 problems with trying to have too much planting on the
20 side close to the processing area because of the 14: 18
21 dangers of fire. Again, I'd leave it to the
22 applicants, perhaps, to expand on that.

23
24 The white colour of the tanks is what makes them stick
25 out, presumably the white colour was taken because that 14: 18
26 way it would reflect the sunlight and slow down any
27 heating up of the tanks. But I just wondered if there
28 were more neutral colours that, perhaps, could achieve
29 the same effect and be less obtrusive in the landscape

1 there.

2

3 One other short thing. Just a moment while I turn the
4 page. I was not expecting you to call on me so
5 quickly, I am afraid I am not quite organised. It was 14: 19
6 to do with the recreational amenity. When this
7 proposal first was mooted I discussed it with some of
8 our members who live in the area and they had a very
9 strong feeling that, well, if a lot of industrial
10 projects are being set up on the Shannon Development 14: 19
11 site it would be nice if the community could have some
12 other benefit from it in the case of amenity. I don't
13 want to be too specific as to what the company, or
14 whatever other companies are going to be sited on the
15 Shannon Landbank, and, in fact, the locals may have 14: 19
16 more ideas about this than I would have, but we do feel
17 that there should be some bit of access to the shore,
18 or maybe some kind of right of way through it. Not
19 necessarily through the plant itself, that's obviously
20 not on. But some other way that the community could 14: 20
21 gain some recreational benefit from it. I will leave
22 it at that. Thank you very much.

23

24 END OF SUBMISSION

25

26 INSPECTOR: Thank you Ms. McMullin. I
27 am going to allow
28 submissions in total and then I am going to allow the
29 applicants to respond in the fashion that we have done

29

1 to date. So, does anybody else wish to say something.
2 **UNKNOWN SPEAKER:** Thank you, Mr. Inspector.
3 I am also a member of An
4 Taisce, the Kerry branch of An Taisce and that's why I
5 am sitting here with Catherine McMullin. I suppose, 14: 20
6 just to make a very brief statement. I suppose
7 everyone has their own special area of interest in
8 this. You know, Kerry County Council would probably
9 get some money if the facility went through. Everybody
10 has their own area. LNG would like to get it through, 14: 20
11 you know, because there is a profit margin there,
12 surely. For myself I am mostly in the environmental,
13 you know, those would be my concerns. In that area we
14 actually put pen to paper and we produced a magazine
15 Kerry Eco News, which showed the beauty and 14: 21
16 sustainability of Kerry. In fact, this lady came back
17 from Canada and saw the beauty of Kerry and she said we
18 must do something to maintain it. So, I gladly obliged
19 with any input I have. In fact, I have a song in
20 there, I have a ballad for the planet, which I wrote. 14: 21
21 But at the moment we are just trying to save Tarbert.
22
23 But anyway, that's my input into it. The thing is we
24 have a beautiful area all around Kerry and we want to
25 preserve it. So, that's why I am here today, as a 14: 22
26 member of An Taisce and as an individual from Tarbert.
27 Another thing is maybe there are people there who have
28 a certain interest in contracting and in making a
29 profit margin on rent from their properties, too, and

1 developing in other addendums, in other areas outside
2 and including the village. So, you know, good luck to
3 them. But that is my concern anyway, is the
4 environment and sustainability and, of course,
5 primarily safety. Thank you, Mr. Inspector. 14: 22

6 **INSPECTOR:** Okay. Anybody else?
7 Mr. McElligott, I think you
8 have an expert who wishes to make a presentation.

9 **MR. J. McELLI GOTT:** Yes, please.

10 14: 23
11 **DR. DECLAN DOWNEY PRESENTED HIS SUBMISSION AS FOLLOWS:**

12
13 **MR. DOWNEY:** Mr. Inspector, I shall
14 introduce myself very
15 briefly. I am Dr. Declan Downey, University College 14: 23
16 Dublin, School of History and Archives. I should like
17 to speak very briefly about the heritage and historical
18 aspects of this area and drawing specific reference to
19 some of the proposals for the location of tanks within
20 400 metres, of Ralappane House. Now, the area, the 14: 23
21 immediate local area, consisting of the townlands of
22 Kilcolgan, Ardmore, Caroonakilla, Saleen, Returk,
23 Lislaughtin, Poolen (as heard), these areas are very
24 well steeped in history going back over a period of
25 2,000 years human habitation. But I am not going to 14: 23
26 speak about the archaeological significance of the area
27 I am going to speak about the historical significance
28 of the area.
29

1 Within that radius we have very fine ruins of the 15th
2 century Abbey, or friary of Lisloughtin. Not far away
3 from that, of course, Carrickfoyle Castle, which has
4 been referred to earlier. These are two of the jewels
5 in the crown of North Kerry tourism and are very much a 14: 24
6 part and focus of the tourist industry. Which I might
7 add is being developed at a higher level now to niche
8 market tourism, in terms of cultural tourism.

9 So, the visual impact of the tanks that are being
10 referred to by Ms. McMullin from An Taisce, this is a 14: 24
11 matter we look forward with interest to hearing from
12 LNG how they propose to deal with this issue.

13 Certainly, we can cooperate with them with regard to
14 suggestions. Some have referred to the planting of
15 trees. I have seen in other areas a very useful 14: 25
16 situation of the building of earth mounds around the
17 tanks. That also helps in the event of fire.

18
19 But my specific concern to address you here is with
20 regards to Ralappane House. Now, Ralappane House, 14: 25
21 Ladies and gentlemen, is a 17th century farmhouse and
22 here in Ireland we have very few farmhouses that date
23 back as early as the 17th century. Most date to the
24 mid 18th century or late 18th century, or indeed from
25 the early 19th century. 14: 25
26

27 Ralappane House, as I said, is 17th century and it is
28 on the site of an earlier habitation, a medieval manner
29 house, which was part of the lands of Carrickfoyle. It

1 was held by the O' Connor Kerry family for over 700
2 years. Then it passed, in the 17th century, into the
3 hands of the Sands family, a Cromwellian planter
4 family. Later it passed into the hands of the Hoare
5 family. Then it passed, through marriage, in around 14: 26
6 1820 to the Musgrave family, who occupy it at present.

7
8 It is a two-storey L-shaped residence, of four bays
9 with a porch in front. It is gable ended with chimney
10 stacks set unevenly between the gable ends. It has 14: 26
11 dormer windows, with very interesting fret work
12 features around the windows and porch. Its interior is
13 remarkably well preserved. It has some very fine early
14 18th century paneling and a very fine staircase, etc.,
15 and it is reputed to have been the birth place of a 14: 26
16 17th century Irishman who had tremendous distinction in
17 Europe, Bonaventure O' Connor Kerry. He was a
18 Franciscan who had been professed in Lisloughtin Friary
19 and later educated in Louvre and in Salamanca and at
20 Airfort. He became a theologian, a dualist, he was a 14: 27
21 great classical scholar in the course of his long and
22 distinguished careers in the Universities of Airfort,
23 Innsbruck and [inaudible], and has left a considerable
24 corpus of literature, in terms of the origins of
25 international law and theology. He is one of our 14: 27
26 significant figures of 17th century Irish history. He
27 is a significant figure on the European context as well
28 and Ralappane is reputed to have been his birth place.
29 So, there is that connection, too, which also enriches

1 its focus and its importance in terms of North Kerry
2 tourism.

3
4 Not far from Ralappane there is another area, down in
5 Ardmore, and there are a few old farmhouses down there, 14: 28
6 which, of course, have been abandoned since they have
7 been sold to the various speculators in the 1970's,
8 forming part of that Landbank. But, again, one of
9 those farmhouses, which belonged to O' Connor family and
10 remained in their possession down through the 14: 28
11 centuries, was the reputed birthplace of another Kerry
12 man and, indeed, Irishman of great international
13 reputation in 17th century Europe, and that Bernard
14 O' Connor Kerry, who was a very distinguished medical
15 professor at Oxford, Paris, he was physician to King 14: 28
16 Yansovieski of Poland. He had a very distinguished
17 international career, not only as a medic, as a great
18 professor of surgery and its use, in developing that,
19 but he was also an historian and he was the first to
20 write an history of Poland. 14: 29

21
22 So, we have a very deep sense of historical
23 significance in this region of North Kerry. A
24 significance that stretches not just only beyond North
25 Kerry to the rest of Ireland but further afield, to 14: 29
26 Europe. Therefore, I would request that LNG would
27 address the issue of the location of storage tanks
28 within 400 metres of Ralappane House specifically.
29 Also, in view of the fact that various submissions have

1 been made with regards to the environment, health and
2 safety issues, amenity, etc., that some way could be
3 worked out whereby the genuine and legitimate concerns
4 of the local residents could be balanced with the
5 concerns of LNG in producing a suitable and workable 14: 30
6 solution to these matters.

7
8 So, therefore, Mr. Inspector, I should just like to
9 conclude my remarks that I hope that I have indicated
10 to you the importance of this locality in terms of its 14: 30
11 historical significance as well as in terms of
12 heritage, its impact, of course, as well for local
13 tourism and that, hopefully, this matter can be
14 addressed by LNG with regards to the location of their
15 storage tanks and modifications that could be made to 14: 30
16 the visual affect of those tanks, too. Thank you.
17 Inspector.

18
19 END OF SUBMISSION
20 14: 31

21 INSPECTOR: Thank you, Dr. Downey.
22 MR. O'NEILL: If I could just briefly
23 respond to that. Maybe
24 not, I don't want to interrupt the flow and I can deal
25 with it later if needs be. 14: 31

26 INSPECTOR: I think we will try and see
27 if there are any further
28 submissions. Mr. Kearney, you are Adam Kearney &
29 Associates; is that right?

1 MR. KEARNEY: That's right, yes.

2 INSPECTOR: You have made submissions
3 in relation to visual
4 impact as well, do you wish to say anything.

5 MR. KEARNEY: Not at this time, no. Just 14: 31
6 to reiterate the fact that
7 I think the bulk and scale of the tanks is overwhelming
8 in this location.

9 INSPECTOR: Okay. Ms. Griffin?

10 MS. GRIFFIN: Catriona Griffin. I just 14: 31
11 want to check. In the
12 brochures we have been given it says the height of the
13 tanks is 50 metres, but if you take into account the
14 various valves and rods on top of the tanks they appear
15 to be more like 70 metres in height. 14: 31

16 INSPECTOR: Okay. Do you wish to make
17 another statement?

18 UNKNOWN SPEAKER: I just want to make another
19 statement. Yes, it is on
20 record and An Bord Pleanála granted planning permission 14: 32
21 for about 20 wind turbines in the Tarbert area. I
22 don't know exactly the location. But, you know,
23 obviously, that is a couple of years ago and they were
24 never followed through. I know that there were some
25 objections in Tarbert, I don't know why, but there was. 14: 32
26 Maybe some people were close by and the wind and
27 everything else. But I maintain that, this would be my
28 submission anyway, that if the whole landbank was
29 utilised with wind turbines I'd say that they could

1 supply a tremendous amount of energy. It is
2 sustainable, it will last forever and I don't think
3 there is any danger of them blowing up. I put my
4 submission fully for full safety. It was brought up
5 the other day that even boiling a kettle is not fully 14: 33
6 guaranteed safe but relatively I do believe more safe
7 than an LNG gas terminal. So would wind turbines.

8
9 I do believe that we have to move away from fossil
10 fuel, however safe it is they say, or environmentally 14: 33
11 impacted, and move on to sustainable energy. Global
12 warming is here or global heating, whichever you want
13 to call it, is here. It is not ten years down the
14 line, it is here. We have the capacity in this country
15 to supply all our LNG needs with sustainable wind, wave 14: 34
16 and sun. If the Vatican, which is a State, if that can
17 be carbon neutral -- I believe it is a small State but
18 it is the only State which carbon neutral in the world.
19 We have all the facilities here and working in
20 conjunction with nature I believe that we could do the 14: 34
21 same here, if not at least close to it. Thank you,
22 Mr. Inspector.

23 **INSPECTOR:** Thank you. This is a
24 fairly wide ranging topic,
25 so does anybody else wish to make a submission. Okay. 14: 35

26 **MR. FINUCANE:** Michael Finucane. Just in
27 reply by the way for the
28 record. I would like to reply to Dr. Downey there and
29 his history of the place. I can trace my family back

1 to the 1780's, they are part of the Landbank. But
2 there was a few omissions by Dr. Downey. There was 28
3 Celtic families dispossessed on that land in the
4 plantation of Munster. He also forgot to mention about
5 the decimation of Carrickfoyle Castle, the seat of the 14: 36
6 O'Connors, by General [inaudible] on Palm Sunday, 1690.
7 I have reason to believe it was the
8 first... (INTERJECTION).

9 **MR. INSPECTOR:** Sorry, could you speak a
10 little bit more clearly, I 14: 36
11 think our stenographer is having difficulties.

12 **MR. FINUCANE:** By the decimation of
13 Carrickfoyle Castle, the
14 seat of the O'Connor's Kerry, in 1690, Palm Sunday, it
15 was the first time that gun powder was used in Ireland. 14: 36
16 General [inaudible] was one of the Generals [inaudible].
17 They also sailed up Ballylongford Bay and they sacked
18 the Franciscan Friary at Lislaughtin and murdered and
19 looted the Franciscan Nuns. Three of the nuns escaped
20 and they were caught over Glencloosey, practically near 14: 36
21 where the actual terminal is proposed. They were
22 spotted by the soldiers and their ears were cut off.
23 And that's how the name of that area is called
24 Glencloosey to this day, for years. It is easy to
25 glance over history, if you want to go back far enough 14: 37
26 you can pick what you like out of it. But history
27 should be told as it happened. That's all I can say.

28 **INSPECTOR:** Thank you. Any other
29 contributors?

1 INSPECTOR: Okay, I am going to ask the
2 applicants if they wish to
3 respond to those remarks.
4 MR. O'NEILL: Thank you, Inspector. Some
5 of the issues that have 14: 37
6 been raised will be dealt with in the individual
7 submissions that are made. I would like to just deal
8 with Dr. Downey's observations in case they slip
9 between the submissions and are not dealt with. I
10 don't want them to go unanswered. 14: 38

11
12 The first thing I would say is that the EIS has a study
13 of the historical context of the area, not only the
14 site itself but the immediate area, and that's at
15 paragraph 14.3 of the EIS Volume 2. There is a 14: 38
16 specific reference in that to Ralappane House. I will
17 also note that the occupiers of Ralappane House, the
18 Musgrave family, are, I understand, in fact very
19 supportive of the proposal. I understand that
20 Dr. Downey is appearing on behalf of the Kilkolgan 14: 38
21 Residents Association, and, of course, he is entirely
22 entitled to do that, and very welcome. I don't
23 understand him to be speaking on behalf of the
24 Musgraves. Although if I am incorrect no doubt I will
25 be corrected on that. 14: 39

26 MR. DOWNEY: May I reply to that?
27 MR. O'NEILL: I am practically finished,
28 Dr. Downey can then reply.
29 Mr. Downey has been talking about the house in the

1 historical context rather than the architectural
2 context. I don't understand Ralappane House to be,
3 from an architectural point of view, of particular
4 significance or of sufficiently important significance
5 to be mentioned in the Development Plan. Again, if I 14: 39
6 am incorrect on that no doubt the record will be set
7 straight.

8
9 But really what I am saying is that the historical
10 context of this area has been taken account, has been 14: 39
11 assessed in the EIS.

12 **MR. DOWNEY:** Mr. Inspector?

13 **INSPECTOR:** Dr. Downey, Yes.

14 **MR. DOWNEY:** First and foremost, I know
15 the Musgrave family, I have 14: 40
16 known them all my life, I am a native of Tarbert and I
17 know that they have reservations about the location of
18 these tanks within 400 metres of their house. We are
19 old Tarbert families, we go back over 300 years in the
20 district. 14: 40

21
22 Secondly, as regards the matter of architecture and the
23 architectural significance of the house, this has been
24 noted by a number of architectural historians and has
25 been given prominent coverage in various publications 14: 40
26 regarding the historic houses in Co. Kerry. I would
27 refer you to Valerie Barry's recent publication on the
28 historic houses of Kerry. The interior of the house,
29 as well as its exterior, might not be as grand and as

1 flamboyant as a marvellous Palladian mansion, but that
2 is not the context in which the house is important. It
3 is important as gentleman's farmhouse and that, too, is
4 part of the heritage of the country. Thank you,
5 Chairman. 14: 41

6 **INSPECTOR:** Thank you Dr. Downey.

7 **MR. O'NEILL:** Thank you, sir. If I may
8 just clarify that, in fact,
9 the Barry study to which Dr. Downey refers to is itself
10 referred to in the EIS. As I say, all of these matters 14: 41
11 have been considered and no doubt you can draw
12 attention to those matters. As I say, they are at 14.3
13 of Volume 2 of the EIS.

14

15 I now intend dealing with the various aspects covered 14: 42
16 under this module and the first person I am going
17 to... (INTERJECTION)

18 **MS. GRIFFIN:** Mr. Inspector, could I
19 just answer something that
20 was just said? Could I just make a comment to 14: 42
21 something that was just said?

22 **INSPECTOR:** Okay, Ms. Griffin.

23 **MS. GRIFFIN:** Catriona Griffin. No doubt
24 Mr. O'Neill has read all
25 the submissions on this planning application, as I 14: 42
26 have, and the Musgrave family have not put in a
27 submission either for or against the terminal.

28 **MR. DOWNEY:** If I might add to that,
29 Mr. Inspector. I know that

1 the Musgrave family have reservations, I am a personal
2 friend of them, and I know that they do not wish to
3 make any submission as they wish to retain a certain
4 distance from this.

14: 42

5
6 Mr. O'Neill, just looking over your reference here to
7 the historical coverage of the area, it is rather
8 general. My intention of drawing attention here to the
9 historical significance is to go beyond that. I have
10 referred to significant personages from this area who
11 attract a lot of attention in Europe as well as in
12 Ireland, in terms of the historical interest and
13 significance of the area. Their names and their
14 significance is not addressed in this. But I do
15 complement you on your report, in that you have given
16 an overall view of the historical significance of the
17 area.

14: 43

14: 43

18
19 With regards to another speaker who addressed certain
20 things that I failed to omit earlier. I said that I
21 was going to keep my comments brief and focus on the
22 immediate matters here in relation to Ralappane House
23 and the location of the tanks within 400 metres of that
24 house. The other matters that are raised are
25 interesting but I consider them not to be immediately
26 relevant to the purposes of this forum. Thank you.

14: 43

14: 44

27 **INSPECTOR:** Thank you, Dr. Downey.
28 okay Mr. O'Neill, do you
29 wish to commence your submissions.

1 MR. O'NEILL: Yes, sir, thank you. I am
2 going to ask Mr. Thomas
3 Burns of Brady Shipman and Martin to deal with
4 landscape and visual aspects. He has a presentation to
5 make so he is going to make from the podium if that's 14: 44
6 convenient, sir.

7
8 MR. THOMAS BURNS PRESENTED HIS SUBMISSION AS FOLLOWS:

9
10 MR. BURNS: Okay, Mr. Inspector, I will 14: 45
11 commence. I have prepared
12 a brief statement of evidence and while it deals with
13 some of the issues already dealt with in the EIS, in
14 terms of a summary of the receiving environment and the
15 impacts, I propose to do a summary of that element, as 14: 45
16 you have announced that we should do.

17
18 **Qualifications and Experience:** My name is Thomas
19 Burns, I am a landscape architect and partner with
20 Brady Shipman Martin, Environmental Landscape and 14: 46
21 Planning Consultants. I hold a bachelor of
22 agricultural science degree in landscape from
23 University College Dublin and a post graduate diploma
24 in Environmental Impact Statement Management, also from
25 University College Dublin. I am a member of the Irish 14: 46
26 Landscape Institute and the European Foundation of
27 Landscape Architecture. My main areas of expertise are
28 in the assessment of landscape and visual impacts and I
29 have been involved in such assessments for over 17

1 years. I have been involved in the landscape and
2 visual aspects of numerous Environmental Impact
3 Statements for a wide range of infrastructural,
4 commercial and industrial developments, including for
5 various developments at Irish Cement Facilities in 14: 46
6 Platin, Co. Louth and Mungret, Co. Limerick, the Dublin
7 Waste Energy Project in Poolbeg in Dublin and the
8 Masonite facility in Co. Leitrim.

9
10 **Introduction:** Brady Shipman Martin undertook the 14: 47
11 landscape and visual impact assessment section of the
12 Environmental Impact Statement, the preparation of the
13 associated Photomontages and the development of the
14 landscape proposals for the proposed Shannon LNG
15 project. My statement of evidence provides an overview 14: 47
16 of the principal findings of our assessment and
17 responds to landscape and visual issues as raised in
18 the various submissions to An Bord Pleanála.

19
20 The assessment was conducted having regard to the 14: 47
21 guidance and structure recommended for the studies by
22 the Environmental Protection Agency in their guidelines
23 on the information to be contained in Environmental
24 Impact Statements and the advice notes on current
25 practice in the preparation of Environmental Impact 14: 47
26 Statements.

27
28 The following sections I propose to present in an
29 abridged version.

1 The site is a low-lying, undulating land located on the
2 south shore of the Shannon estuary. The Tarbert to
3 Ballylongford Coast Road defines the Southern boundary
4 of the site and the prominent ridge effectively screens
5 views of the estuary from the Coast Road. While the 14: 48
6 broad waters of the Shannon Estuary are the defining
7 landscape feature, however the estuary cannot be
8 considered as an untouched natural landscape as it has
9 previous precedent of the establishment of significant
10 stand alone facilities, include the nearby Tarbert and 14: 48
11 Money Point generating stations, as well as Aughinish
12 Alumina and Irish Cement further up river. The site is
13 visible from the Co. Clare side of the estuary, from
14 the waters of the estuary and from limited sections of
15 the south shore extending west to beyond Ballylongford 14: 48
16 Bay.

17
18 The undulating nature of the landscape east of the site
19 provides for effective middle ground screening, while
20 intervening roadside and field vegetation provides 14: 48
21 effective foreground and middle ground screening of
22 views from within the flatter landscape west of the
23 site.

24
25 In summarising the landscape planning context. The 14: 48
26 site, together with the adjoining lands, is zoned for
27 industrial related use in the Kerry County Development
28 Plan. The Plan does not identify the site as either a
29 primary or secondary special amenity area and the site

1 has no trees or woodlands identified for preservation
2 or protection.

3
4 The site falls within the visual context of two
5 identified view and prospects, one from Carrig Bridge 14: 49
6 local road and the second from the elevated lower
7 slopes of Knockinore Mountain some 10km distance. The
8 site also falls within the visual context of a number
9 of scenic routes, as identified within the Clare County
10 Development Plan. 14: 49

11
12 Now, I am going to go on and just summarise the
13 potential impact section. That's page 6 of my brief of
14 evidence.

15 14: 49
16 **Construction Stage:** The construction stage will give
17 rise to landscape and visual impacts through earthworks
18 and general construction activity. Construction works
19 will be of a significant visual influence. However, a
20 similar level of construction related activity is 14: 50
21 commonly associated with the majority of major
22 infrastructural projects, including road schemes and
23 any large green field development. Indeed, the
24 construction of any major facility on this site would
25 result in similar overall levels of site disturbance 14: 50
26 and landscape and visual impact.

27
28 **Operational Stage:** While the development has many
29 associated elements and features the proposed LNG tanks

1 will be the primary visual impact features and the
2 development will give rise to significant visual impact
3 for properties within the immediate areas. Nighttime
4 illumination, which is an existing feature of the Money
5 Point and Tarbert Island generating stations, will tend 14: 50
6 to accentuate the degree of change in the landscape.

7
8 LNG ships will be prominent visual features in moving
9 through the estuary and in mooring at the LNG site.
10 However, the estuary is an important shipping corridor 14: 50
11 and large ships already move further up stream to
12 Foynes and Aughinish Alumina.

13
14 The proposed development will come within the visual
15 context of two views and prospects within Co. Kerry and 14: 51
16 three scenic routes within Co. Clare. The listings do
17 not preclude development and the existing generating
18 stations at Money Point and Tarbert already define the
19 visual context of the listings. It is considered that
20 the proposed development will not be significantly 14: 51
21 obtrusive or impacting on these views.

22
23 The Kerry County Development Plan identifies the site
24 as a potential location for a premier deep water port
25 activity and associated industrial use. Again, it is 14: 51
26 likely that any major industrial development, in
27 whatever form it may take, would result in a similar
28 degree of landscape and visual impact on this site.

29

1 **Mitigation Measures:** This is page 9 of the brief. In
2 terms of mitigation, a series of measures have been
3 considered throughout the process from design to layout
4 to construction and operation of the facility. Some of
5 the specific design and layout measures aimed at 14: 52
6 reducing landscape and visual impact include: The use
7 of lower profile tanks some 8m lower in overall
8 elevation than normal profile LNG tanks; the excavation
9 of a lower base level on which to locate the tanks,
10 thereby avoiding skyline impact when viewed from the 14: 52
11 north and reducing local visual impact; and siting of
12 the tanks close to the shore, at the minimum practical
13 level, makes best use of Ralappane ridge-line in
14 providing screening for local residences and areas
15 further south. 14: 52

16
17 In addition, the landscape design provides for the
18 reseedling of disturbed areas outside of the actual
19 operational parts of the development with dry grassland
20 seed mixes. New tree and shrub planting will be 14: 52
21 established on up to 8 hectares of the site, including
22 areas of regraded slopes, areas along the site
23 boundary, along the public road and at entrances.
24 Consultation has and will continue to take place with
25 local residents, particularly with regard to the type 14: 52
26 and location of planting. The aim is to provide an
27 acceptable level of integration of the development,
28 while retaining existing views to the Shannon Estuary.
29

1 At this stage Mr. Inspector, I would just say that
2 photomontages were prepared for the EIS and these have
3 been included in the EIS, but I would propose to go
4 through a small number of those just to set the visual
5 context and the setting for what we are talking about 14: 53
6 today.

7
8 First, this is the plan which shows the location and
9 range of Photomontages that have been prepared for this
10 particular project. As you can see, they include 14: 53
11 Counties Kerry, Limerick and, indeed, Co. Clare to the
12 north. This is the first one, it is View 2 from the
13 list of EIS montages. It is taken from the Coast Road
14 directly south of Ralappane House. It shows a number
15 of things. First of all, it shows Money Point here on 14: 54
16 the right-hand side, visible just over the landscape.
17 The second thing is, and important thing here, is it
18 shows the effect of Ralappane ridge-line. This ridge,
19 which rises to about 34 metres over datum, has a
20 significant effect in screening the site and in 14: 54
21 screening the estuary from the Coast Road. So, as you
22 are moving through landscape you are unaware of the
23 estuary, which is in dramatic contrast to areas further
24 east and west, where you are much more proximate to the
25 actual estuary and visually experience it. 14: 54
26

27 If we move on. That's the existing view. This is the
28 as proposed view. It shows the effect of the ridge in
29 screening the tanks, but also the effect of the

1 earthworks and the regrading that was proposed on this
2 site in order to set the tanks as low as practical on
3 the site, thereby reducing the impact from the majority
4 of the residences, which are located south of the
5 actual Coast Road itself. So, we can see one tank is 14: 55
6 directly behind the farm buildings, one tank is
7 directly behind the house, one is behind this clump of
8 trees and one tank, further west, is more open to view
9 there.

10
11 The second one prepared is View 4, which was taken on 14: 55
12 higher lands further south of the development. Here
13 you can see the nature of the elevated views that some
14 of the residences have over the site and to the
15 estuary. Now, again, Money Point is just to the right 14: 55
16 of the house, it is visible over the lower part of the
17 house, to the immediate right. But apart from that it
18 is an open view. Here we have the LNG tanks inserted
19 into the view and, again, it shows how we have tried to
20 set the tanks so that as much as possible we tried to 14: 56
21 avoid breaking up onto the skyline in some of these
22 critical views. Now, this isn't always possible in
23 every location. But I think you will see as we go
24 through this that we have tried to achieve this in the
25 majority of situations. Again, there is an expansive 14: 56
26 and open view of the estuary which retained in this
27 view.

28
29 This is a view from the Tarbert to Ballylongford Coast

1 Road southwest of the south, and this is View 7 from
2 the EIS. Again, we have got Money Point in the
3 distance, in the centre of the view here, in the
4 distance, in an otherwise very typically flat North
5 Kerry landscape.

14:56

6
7 This is the tanks inserted into this view and the tanks
8 appear just to the right of Money Point. But they are
9 not of particularly significant impact in this
10 location. It shows the effect of -- once we are into a 14:56
11 very flat landscape, with a lot of intervening
12 hedgerows and trees, and even roadside boundaries, even
13 though they are not particularly significant in height
14 it is just the interlocking effect and the actual
15 foreground screening that they provide. They just 14:57
16 provide that basic anchoring for the visual setting of
17 the tanks. The critical thing here is I think we can
18 all accept that these tanks cannot be screened
19 entirely, but it is important that we try to anchor the
20 base of the development into the landscape so that the 14:57
21 whole of the development does not appear to loom up
22 from the local landscape.

23
24 Second, this view here is View 12 from the EIS and it
25 is from Carrig Island to the west of the site. So, we 14:57
26 are viewing across the waters of the south estuary.
27 Here we have the tanks appearing just on the promontory
28 and this is one of the most open views of the
29 development from the Kerry shoreline. Again, we have

1 the Money Point generating station to the left of the
2 view and the stacks are considerably higher, rising to
3 220m above datum. The tanks on the site here are
4 rising to 60.5m above datum. That's the top of the
5 tanks, I will come back to the height of the tanks
6 again.

14: 58

7
8 Here we have another view from much more elevated
9 lands, on a local road in Ballykilane Upper, to the
10 southeast of the site. We are looking north over the
11 whole of the North Kerry coast from this location. It
12 is a very panoramic and expansive view. We have got
13 Tarbert on the right, Tarbert Island on the immediate
14 right. Again, we have Money Point. At this distance
15 it is less distinct but it is in the centre of the
16 view. The site is immediately almost above the tourist
17 sign in this location here. So you will see the tanks
18 insert in to the right of where I was pointing. It is
19 just there. So, the four tanks are located in there.
20 They are not particularly intrusive visually in the
21 view, the wide expansive nature of the view still
22 dominates the view of the estuary. At the end of the
23 day, the existing visual references of Tarbert and
24 Money Point will still be the dominant visual
25 references in that landscape.

14: 58

14: 58

14: 59

14: 59

26
27 Here is a view. Now we move across the estuary on to
28 Co. Clare and we are on the N67 at Killimor. We have a
29 residence in the immediate foreground and we have Money

1 Point just beyond. In this location the site is on the
2 far side of the estuary, on the southern side, in the
3 background. This is where I come to the fact that we
4 have purposely designed these, selected the height of
5 the tanks and the base level to try and maintain the 15:00
6 top level in line of the skyline or below it. So that
7 from Co. Clare we are not appearing to break and to
8 come up onto the skyline. I think that is important in
9 these views.

10
11 Again, we are on the N67 and viewing more directly
12 along the road and across the estuary to the site.
13 Again, we have the tanks located very close to the
14 shoreline and, again, they are not breaking the
15 skyline. There is an issue in the submission from Co. 15:00
16 Clare as to the arrangement of the tank and I will come
17 back to that again. But I think shows that while they
18 are a linear arrangement there is still that view
19 through. And it is not a wall of tanks, as was implied
20 in the submission. In many regards, in fact, the ship 15:00
21 in the view is probably the most prominent element, and
22 that's infrequent and when it is not moored it is
23 moving up and down the estuary. It is a feature which
24 is common on the estuary at the moment.

25
26 If we move into a few night-time shots. This is the
27 same location. As you can see, it is a shot taken at
28 night-time from the same location. We have got the
29 illumination associated with Money Point in the

1 middle-ground there, on the left-hand side. Here we
2 have the inserted LNG facility on the background of the
3 estuary here. It is a much less illuminated facility
4 than Money Point, or either Tarbert for that matter.
5 The lighting has been specifically, where possible, 15: 01
6 been minimised and, also, designed to refuse the
7 night-time glare effect that you do see on the Money
8 Point facility. I think it is even more noticeable in
9 this one. This is an existing one again taken from one
10 of the daytime locations. Again, this is the 15: 01
11 night-time version, again on the N67. It shows the
12 strong dominant effect of illumination which is on the
13 Money Point facility. In the background there is the
14 insertion of the LNG facility.

15 15: 02
16 Now, finally then in the photomontages, looking at the
17 Co. Kerry side. Here we have a view from southwest of
18 the site, an elevated view, slightly elevated view.
19 You have got Money Point, again a very much an
20 illuminated facility, in the background, over the ridge 15: 02
21 of Ralappane there it is visible. If we insert the LNG
22 facility, again there is illumination and it is
23 certainly going to draw reference to the presence of
24 the facility at night. However, it is not illuminated
25 to the same extent that is in the existing facilities 15: 02
26 at Money Point and Tarbert.

27
28 Okay, I propose at this stage just to move on to deal
29 with some of the submissions and some of the issues

1 raised in the submissions to An Bord Pleanála. I will
2 just give you the correct page reference. This is page
3 10 of my brief of evidence.
4

5 **Item 7 - Response to Submissions to an Bord Pleanála:**

15:03

6 A number of landscape and visual related issues have
7 been raised in submissions on the proposed Shannon LNG
8 facility. While submissions by Clare County Council
9 and Kerry County Council are discussed at the end of
10 this section the principal issues raised by third
11 parties are considered separately in the following
12 sections. The first issue relates to the boundary
13 fence.
14

15:03

15 There have been some concerns raised regarding the
16 proposed 2.9m high boundary fence and that the
17 photomontages do not show the boundary treatment. In
18 response to that: The boundary fence is required for
19 reasons of access control and health and safety on the
20 site. The proposed fence is to be 2.4m high chain-link
21 fencing with barbed wire on top, taking the full height
22 to 2.9m. In general, the fence is to be located at or
23 close to the site boundary. Where existing hedgerows
24 define the boundary the fence will be located to the
25 inside. Where the boundary is undefined, open or
26 adjusted the fence will be located on the boundary and
27 planting willing be established along the inside. In
28 either situation the fence will not be particularly
29 visible and will not give rise to visual intrusion or

15:03

15:04

15:04

1 impact.

2
3 The photomontages do not illustrate the boundary fence.
4 However, the fence, if present, would only be visible
5 in View 3 (figure 5.3.3b of the EIS). In all other 15:04
6 views the fence is screened from view. In addition, a
7 number of residents have expressed a particular concern
8 about the location of the fence along the Coast Road.
9 While the fence was to be located close to the road,
10 the applicant is willing to have the fence set back 15:05
11 into the site, where it can be screened by low planting
12 along the roadside. Where the road is to be widened,
13 the edge of the new road will be defined by a new sod
14 and stone bank in keeping with the existing road
15 boundary. 15:05

16
17 Mr. Inspector, at this point, as the fence was not
18 included in photomontage View 3 we have prepared an
19 updated version and that's figure 5.3.3c. This shows
20 the fence and I just go to that now. This was the view 15:05
21 as in the EIS and the fence which would be here is not
22 visible in that, is not being included in it. This is
23 an updated view and the fence runs across the view at
24 that location there. It is not particularly visible
25 because you do have planting behind it, so you are 15:06
26 always seeing this fence against the background of
27 planting.

28
29 However, as I said in my response there, there has been

1 particular concern about this fence raised by some
2 residents and an alternative option was prepared. That
3 will give you this effect, where the edge of the road
4 is defined by a sod and ditch bank and the fence is
5 located in a much lower level back from that fence. If 15:06
6 I just move on. This drawing here shows the
7 alternative proposed locations for this fence, showing
8 how it is set into the site. It is actually set at a
9 level which is much lower than the road. If we have a
10 look at this in section this is the effect of what we 15:06
11 are looking at. We have the road and the road is
12 widened in some locations, we have a grass margin verge
13 and the actual fence was to be located at that location
14 there. But what we are now proposing, what the
15 applicant is proposing is that they are willing to have 15:07
16 the fence located at a much set back location, which is
17 considerably lower than the road and the planting, it
18 is much easier to screen the fence with low planting,
19 while at the same time not really interrupting views
20 from the residents towards the estuary. That is a 15:07
21 particular concern of the residents, to try and retain
22 as much open views as possible. That's a current
23 proposal on that, which we are proposing to address
24 some of the residents' concerns.

25
26 If we move on to issue two, which is visual mitigation.
27 A number of submissions have raised issues that steps
28 should be taken to reduce the visual impact of the LNG
29 plant as much as possible and that insufficient

1 information on landscape and visual mitigation and
2 issues of why was the white colour of tanks chosen and
3 why not plant mature trees along the road.

4
5 In response to these issues: As stated in the EIS 15:07
6 (section 5.6) and noted previously in my brief of
7 evidence, significant measures have been incorporated
8 into the design of this facility, the layout of the
9 facility and the proposed landscaping so as to mitigate
10 landscape and visual impact. 15:08

11
12 These mitigation measures, in particular, they include
13 the use of lower profile tanks, and these are 8m lower
14 than normal LNG tanks. The tanks are located on the
15 lowest practical excavated base level. The excavation 15:08
16 of a lower base level on which to set the low profile
17 tanks. This setting and the siting of the tanks makes
18 best use of Ralappane ridge-line for visual screening
19 and backdrop. The development has an overall compact
20 layout, reducing its visual expanse. This is 15:08
21 particularly as viewed from the Kerry side and from the
22 local residents. Earth modelling and regrading is
23 utilised to screen and break up the obviously
24 engineered forms, such as access roads, leveled areas.
25 Extensive landscaping, including predominantly native 15:09
26 and indigenous tree and shrub planting is also
27 proposed.

28
29 Just to try and illustrate, because it has been raised

1 here by Professor Downey again today, that measures
2 have been taken on board in terms of mitigating the
3 landscape and visual impacts and I am just going to go
4 through a series of some sections which illustrate the
5 effect of some of these measures.

15:09

6
7 This is a sketch, just a typical section through the
8 sight at the location of where the tanks are. We have
9 a sea level at the estuary and we have an approximate
10 level on top of Ralappane ridge-line of 34m AOD (above
11 datum) and that's Malin.

15:09

12
13 One of the first things that was looked at is just
14 placing your normal LNG tank on this landscape in a
15 simple engineered form. That would have provided a
16 tank with a top of dome height of 76m AOD (above
17 ordnance datum).

15:09

18
19 Now, I think at this stage, Inspector, it is important
20 to say while I am going through these sections that
21 these are options that were considered but they are not
22 what we are proposing. The tanks that we are proposing
23 have a top of dome height of 60.5m AOD. So you will
24 see how we arrive at that situation in the next few
25 slides.

15:10

15:10

26
27 The second alternative would have been to use the low
28 profile tanks on the minimal site works development.
29 That would have given us a top of dome height of the

1 tanks of 68m AOD. Then another option that we have
2 looked at is excavating out the base of the site, and
3 this is what we have proposed and this is what forms
4 part of the application, this excavation, effectively
5 providing a lowered base level of 10m AOD for the
6 actual platform for the tanks. Again, the actual
7 process area has been set into a further reduced area.
8 You can see the dashed line represents the existing
9 land, so you can see how the tanks and the development
10 have been set into the landscape.

15: 10

15: 11

11
12 Again, this would have been the situation using a
13 normal LNG tank. It would, again, have been a height
14 of 68.5 metres AOD. In this section, which is
15 effectively what is before the Board, is the use of a
16 low profile tank, the tank itself is 50m in height,
17 50.5m in height to the top of the dome. It sits on a
18 platform of 10m AOD and that gives you your top of dome
19 height of 60.5m AOD. I know there is some confusion
20 about those levels out there, but that is the actual
21 levels, the top of the tank is 50.5m high, sitting on a
22 platform of 10m AOD.

15: 11

15: 11

23
24 Just as a summary, this is just a slide which pulls
25 together all the previous ones and it shows how this
26 development has been set into this landscape and the
27 use that has been made of the topography to provide
28 that screening, both to lands to the south and also
29 from areas to the north, in Co. Clare, in using

15: 12

1 Ralappane ridge-line, in as much as practical, as a
2 backdrop to the development.

3
4 So, you have got your higher tank of the upper level
5 and then that's gradually reduced to give us our low 15: 12
6 profile tank sitting on an excavated base. Similarly
7 here, the process plant has been reduced from this
8 level down to this level here. It is effectively
9 tucked in behind the actual tank and it is giving it
10 that very minimal visual presence in the landscape. 15: 12

11
12 Just continuing and moving on to one of the other
13 issues and it is mainly to do with the colouring of the
14 tanks. The LNG tanks are constructed of concrete and
15 do not have a specific white finish. Just to clarify 15: 13
16 that. They are not painted and they do not have a
17 particular colour treatment applied. They are
18 constructed of concrete. However, the natural
19 appearance of new concrete, as has been used in the
20 photomontages, may appear initially near white when 15: 13
21 viewed in direct sunlight. The new concrete finish --
22 now, this was selected in the photomontages as being
23 the most visible. So, the tanks as represented in the
24 photomontages have a new concrete finish and that was
25 chosen because it will present the tanks in their most 15: 13
26 visible form.

27
28 However, as with all concrete products, this initially
29 lighter colour tends to fade or weather to a more

1 visually recessive grey appearance. I will come back
2 to colour again because it is raised particularly in
3 the Clare County Council submission.

4
5 Finally on this issue. The use of mature trees has 15: 14
6 been limited for two reasons: Firstly, there is an
7 expressed wish amongst local residents that existing
8 views to the estuary be retained wherever possible. As
9 such, planting is selected and located so as to avoid
10 additional screening of these views. Secondly, the 15: 14
11 site has an exposed estuarine setting (and this can be
12 evidenced from the existing vegetation), so in this
13 environment more mature trees would be significantly
14 less likely to establish and develop successfully on
15 the site. 15: 14

16
17 In effect, what we are doing is we are taking a
18 long-term view on this project and in terms of
19 establishing the best optimum screening and landscape
20 development we are proposing to use trees which would 15: 14
21 be in the range of 1m to 2m to 3m in height, and that's
22 what is going to give us the best effect in screening.

23
24 Now I am going to move on the issue No. 3, and this
25 deals with scenic areas and scenic routes. Some of the 15: 15
26 submissions call this a pristine amenity and scenic
27 area, the impact on the Saleen to Kilcolgan scenic
28 route and the river is scenic and the river and shore
29 use for recreation. I want to just run through a

1 response on these issues.

2
3 The landscape is of a rural, agricultural and typical
4 low-line nature. While having an estuarine backdrop,
5 it is not designated as either a prime or secondary 15: 15
6 landscape area and, similarly, has no landscape amenity
7 or recreation designation in the Kerry County
8 Development Plan. The site or immediate landscape was
9 not highlighted in An Foras Forbartha's *Inventory of*
10 *Outstanding Landscapes in Ireland* (1977). 15: 15

11
12 The wider estuarine context is the setting for large
13 industrial developments, including electricity
14 generating stations at Tarbert Island and Money Point
15 and Aughinish Alumina, near Foynes further east. In 15: 16
16 addition, the site is zoned for industrial related and
17 deep water jetty use.

18
19 As such, the landscape cannot be described as a
20 pristine and scenic area. While the development will 15: 16
21 be visible between Saleen and Kilcolgan, the route also
22 includes views of both Tarbert and Money Point
23 generating stations. Nevertheless, the estuarine
24 landscape is visually attractive and visually
25 interesting, an aspect which is influenced by the 15: 16
26 existing developments, a landscape image that will not
27 be altered by the proposed development.

1 **Issue 4: Landscape and visual impact:** This is
2 concerns relating primarily to the visual impact of the
3 tanks and the impact on the greenfield site and scenic
4 rural area and that the tanks will destroy the
5 landscape. I am dealing with these in this response. 15: 16

6
7 As already noted in response to issue No. 3, that I
8 have just gone through, the landscape is of a rural,
9 agricultural, typical lowland nature. It is not
10 designated as either a prime or secondary landscape 15: 17
11 area and, similarly, has no landscape amenity or
12 recreational designations in the Kerry County
13 Development Plan. The wider estuarine landscape is
14 also the setting for large industrial developments,
15 including electricity generating stations at Tarbert, 15: 17
16 Money Point and, also, Aughinish Alumina. While the
17 site is a greenfield in appearance, it is zoned for
18 industrial related and deep water jetty use and any
19 such development would have a similar level of
20 landscape and visual impact. Undoubtedly, the 15: 17
21 development will give rise to locally significant
22 impacts. However, given the presence of other
23 significant development on the estuary, the Shannon LNG
24 facility will not adversely alter the existing
25 estuarine image of the landscape and will not be 15: 17
26 seriously injurious to its landscape and visual
27 characteristic.

28
29 Construction impacts - In particular, there was an

1 issue on the impact of lights during construction.

2
3 In general, construction working will be between the
4 hours of 7:30 a.m. to 6:00 p.m. weekdays and 8 a.m. to
5 2:00 p.m. on Saturday. However, 24 hour working will 15: 18
6 be required for tank concreting (slip formation) and
7 for some jetty works as required by weather or tide.
8 As such, with the exception of occasional short term
9 periods, the main lighting during construction will be
10 restricted to early mornings and late evenings during 15: 18
11 winter months, and a low level of site lighting will be
12 required at all times for security and safety reasons.
13 It is worth noting that a significant level of
14 nighttime lighting is an existing feature of Tarbert
15 Island and, most especially, Money Point generating 15: 18
16 statement. This lighting is clearly illustrated in the
17 EIS nighttime photomontage (View 29, figure 5.3.29) and
18 I have already shown that image today.

19
20 The visual impact from Co. Clare was brought up by the 15: 18
21 third parties but it is also brought up in more detail
22 by Clare County Council and I will deal with that
23 towards the end of this submission.

24
25 The height of the tanks, there is a statement that the 15: 19
26 height of the tanks was lied about and while
27 Mr. Bowdoin has already responded to this issue I will
28 again just clarify the issue, because it is being
29 raised here again today. There is some confusion, and

1 it is just confusion, between the height of the tank
2 and its elevation above datum. It comes down to the
3 fact that the site for the tanks is effectively at a
4 level of 10m AOD. So, every height is then, to get its
5 level above datum, you then add on 10m. So, while the 15: 19
6 top of the dome is 50.5m that is 60.5m above datum.
7 And that's all it is.

8
9 I would probably draw people's attention to figure 3.14
10 of the EIS. That shows the cut away section of the 15: 20
11 proposed LNG tank and it clearly shows the height of
12 the tank, both at the cylinder, at the cylinder wall.
13 The height of the cylinder wall is 40 metres. The top
14 of the dome is 50.5m. There was a query there today
15 about the top of the vent, the top of the vent is 15: 20
16 61.5m. That is the highest point of the structure.
17 However, in a visual context, the basic tank is the
18 primary feature, the vent and other aspects are not of
19 particular visual significance.

20
21 **Issue 8: Submerged tanks - should use submerged tanks**
22 Again, this has already been responded to by Mr.
23 Bowdoin.

24
25 **Issue 9: ESB powerlines - pylons and powerlines** 15: 21
26 The powerlines are not part of this application and
27 Mr. Power and Ms. Lyden have responded to this issue so
28 I don't propose to go back into that.

1 Similarly, the issue of the gas power station has
2 already been responded to. The submission did not
3 include for a gas power station and, therefore, it is
4 not included in the photomontages. That was one of the
5 issues raised in the submission.

15: 21

6
7 **Issue 11: Photomontages do not show the tanks**
8 **accurately**

9
10 In response to this: The photomontages were prepared
11 using survey, site and photographic reference
12 information. This information was then used in
13 digitally establishing and inserting the rendered model
14 of the proposed development. The representation of the
15 tanks in the photomontages is fully accurate. Just to
16 show the process by which the photomontages have been
17 prepared I have got a number of slides that just give
18 an overview of that. I just propose to run through
19 these slides.

15: 21

15: 21

20
21 Just for illustrative purposes what we have done is we
22 have taken View 9, which is one of the views shown in
23 the EIS, and I will just run through how that has been
24 set up.

15: 22

15: 22

25
26 The first stage is to take an existing photograph. So,
27 you identify the site. We survey this site, the camera
28 location, and we take the actual photograph. This
29 photograph has a number, it is centred on Money Point

1 and otherwise it is a typical landscape shot of the
2 area.

3
4 The second stage is to survey in a number of reference
5 points that appear in the landscape and which have also 15: 22
6 been included in the photograph. So, for instance, for
7 this photograph the top of this ESB pole was surveyed,
8 the top of Money Point stack, the ridge of a house in
9 the centre of the shot and the ridge of the house to
10 the right of the shot. It is important, when you are 15: 23
11 surveying these points, that you take a range of
12 locations across the photograph, because they are used
13 in fixing the development into the site and making sure
14 that it is at the correct level.

15 15: 23
16 The second stage, you set up the camera angle. So, you
17 record the angle and you set it up on the photograph so
18 you know how it all relates from the actual camera to
19 the actual reference points which are shown here.
20 Meanwhile, at the same time a model of the actual 15: 23
21 development is prepared. This is prepared from the
22 application drawing, so you have a fully accurate model
23 prepared in 3D and it is capable with the ability to
24 look at this model from any angle and to prepare an
25 image from any angle required. In this instance we 15: 23
26 prepare an image from the camera angle.

27
28 So, this is how it looks when the model has been
29 rendered from the location of the camera, from the

1 height of the camera. This shows the tanks, it shows
2 the terrain and these four cones, the top of the cones
3 indicate the reference points which have been selected
4 on site and surveyed in. You will see in the next few
5 slides how that works.

15: 24

6
7 Next thing, we take out the black background and the
8 model is set into the photograph using the reference
9 points. So, if I just flick between those two you will
10 see how the model comes in. Because we have a range of
11 reference points we are fully confident that the
12 development is at the correct height and, also,
13 importantly for a wide development, that it is at the
14 correct angle, that it is set within the landscape at
15 the correct angle, so there is no tilting of the model
16 in the view.

15: 24

15: 24

17
18 Then to finish the photomontage procedure we remove the
19 reference points. Secondly, the development is cut
20 into the landscape. So, those elements of the
21 landscape which are in front of the development are cut
22 to the front so you have it in its correct visual
23 position, where you can see the difference. Because of
24 the intervening vegetation all the lower elements of
25 the development are removed. Finally, this shows the
26 effect then of some further earthworks and planting
27 associated with the development.

15: 25

15: 25

28
29 So, that's how the actual photomontages are prepared,

1 and each and every one of the photomontages have been
2 prepared in this manner.

3
4 Issue 12: Some photomontages say the visual impact is
5 moderate to slight - from many views it is much
6 greater. This is one of the issues raised in
7 submission.

15: 25

8
9 While the visual impact from many locations is, indeed,
10 considered to be slight or moderate, in some locations
11 the visual impact is also greater. These more
12 significant impacts have been assessed and described in
13 detail in the EIS (section 5.5.3) and they have been
14 noted in my full statement of evidence, which I have
15 not read out here again. I just draw your attention to
16 section 5 in the statement of evidence. I don't
17 propose to go back into.

15: 26

15: 26

18
19 I don't accept the issue, that the assessment states
20 that the impact is moderate to slight. It is moderate
21 to slight in some locations. It is greater than that
22 in other locations. And that has been assessed fully
23 and correctly in the EIS as appropriate.

15: 26

24
25 Now, if I can move onto the submission by Clare County
26 Council. The submission notes that the southern shores
27 of the Shannon Estuary are mainly rural and
28 agricultural in nature. However, the Money Point power
29 station forms an industrial focal point in the area and

15: 26

1 that views across the estuary to the site are expansive
2 from this area, particularly when viewed from points
3 along the N67 national secondary road. So, the
4 submission is just setting the context and we would
5 support that context. 15: 27

6
7 The submission notes that the shorelines of the
8 southern shores of the Shannon Estuary -- and I would
9 take it that that probably should mean the northern,
10 but I may be wrong in that -- the southern shores of 15: 27
11 the Shannon Estuary and adjoining lands are designated
12 as visually vulnerable in both the West Clare Local
13 Area Plan 2003 and the Clare County Development Plan
14 2005. Policies CDP 46 of the County Development Plan
15 and ENV 1 and 2 of the Local Area Plan relate to a 15: 27
16 protection of vulnerable landscapes and development in
17 open landscape and in areas designated as visually
18 vulnerable.

19
20 So, in particular, policy ENV 2 of the Local Area Plan 15: 27
21 states that *proposals for development within areas*
22 *designated as visually vulnerable will normally be*
23 *permitted only where it can clearly demonstrate that:*
24 *- the proposed development does not intervene with*
25 *views of the water from any point within the visually 15: 28*
26 *vulnerable area, or*
27 *- the view of the skyline is not significantly impinged*
28 *on by the proposed development when viewed at a*
29 *reasonable distance from the ridge-line.*

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Before I go on, I think it is important to state that the "visually vulnerable" designation relates to landscapes within Co. Clare and not to those of Co. Kerry, including the site, which has no such designation. Nevertheless, while often openly visible from within such areas in Co. Clare, it is considered that the proposed development has been designed, sited and mitigated (as set out in section 5.6 of the EIS and section 6 of this statement) so as to meet the objectives of Policy ENV2. Firstly, the development will be viewed in the backdrop of existing views to and over water of the estuary, thereby avoiding any intervention within such views. Secondly, the site has been regraded and lowered and low profile tanks utilised so as to purposefully avoid or reduce potential for skyline impact in views from the landscape of Co. Clare.

15: 28

15: 28

15: 29

Policy CDP 51 of the County Development Plan requires development in the environs of a scenic route - such as that section of the N67 east from Ballymacrinan Bay - *have no adverse obstruction or degradation of views towards or from visually vulnerable features; nor significant alterations to the appearance or character of these areas.*

15: 29

15: 29

That's just from the submission from Clare County Council.

1 The stated section of the scenic route already takes in
2 open foreground views of Money Point station, together
3 with more distant background views of Tarbert Island
4 generating station. The Shannon LNG development will
5 be visible from sections of the route where it will 15: 29
6 appear in the background of such views. The
7 development will not give rise to visual obstruction or
8 degradation of views to and from visually vulnerable
9 features within Co. Clare and it will not adversely
10 alter the particular estuarine image of the landscape. 15: 30
11

12 In discussing visual impact the submission by Clare
13 County Council proposes consideration of a *block of 2x2*
14 *tanks* in contrast to the as proposed line of four
15 tanks. The submission also recommends consideration of 15: 30
16 using an appropriate external colouring or painting of
17 the tanks.
18

19 Given the topography of the local landscape and the
20 location of surrounding residences, a linear 15: 30
21 arrangement for the siting of the LNG tanks is
22 considered the optional layout for minimising visual
23 impact within their overall context. A 2x2 arrangement
24 may have lesser visual impact from Co. Clare; however,
25 this is marginal given the significant distance and the 15: 30
26 fact that the development of either a 2x2 block or a
27 straight line arrangement always forms a smaller part
28 of an otherwise expansive estuarine view. By contrast
29 locally within Co. Kerry, a 2x2 block arrangement would

1 have significantly increased the visual massing of the
2 development from nearby views and from passing views
3 from the Coast Road. In particular, a block
4 arrangement would have necessitated significantly
5 greater excavation into the Ralappane ridge, reducing 15: 31
6 its visual screening effect from residents and roads
7 located further south. Given the nature of the
8 topography, it is also likely that in a block
9 arrangement the second or most southern line row of
10 tank would be sited at a higher base level, thereby 15: 31
11 increasing their visual presence both locally and in a
12 wider context, including from Co. Clare.

13
14 A number of issues are worthy of consideration in
15 responding to the external treatment of the tanks. The 15: 31
16 tanks are large structures, visible against a range of
17 backgrounds, including land, water and sky. More
18 usually the tanks are viewed against a combination of
19 two or more such backgrounds within any given view. In
20 addition, views of the tanks must be considered in 15: 32
21 terms of aspect, with the most open views being from
22 the north, the west or south west. As such, the tanks
23 will be primarily viewed both into the rising and
24 midday sun and with the afternoon and evening setting
25 sun. Against this context the external treatment of 15: 32
26 the tanks must be capable of best minimising visual
27 impact and obtrusiveness in all views, all conditions
28 and consistently over time. Given the scale of the
29 tanks, dark colouring will tend to define and hence

1 accentuate their bulk, Especially at distance. While
2 at proximity dark colouring will tend to increase the
3 perception of proximity and visual massing. White
4 colouring has a high contrast against landscape, and
5 especially water, and its highly reflective nature 15: 33
6 would give rise to glare when viewed with direct
7 sunlight. Taking such factors into account, it is
8 considered that the best appearance can be achieved
9 using a natural concrete finish. While light coloured
10 initially, concrete quickly weathers to a grey, giving 15: 33
11 the optimum visually recessive appearance against land,
12 water, sea and sky. The photomontages used a worst
13 case new concrete appearance. However, this will tend
14 to fade towards a grey finish but will retain an
15 acceptable appearance over time and a visual 15: 33
16 consistency in a wide range of environmental
17 conditions. So, again, I would reiterate there is no
18 proposal to paint or treat the external colour surface
19 of the tank to a white finish.

20
21 Finally, **submi ssi on (Manager' s Report) by Kerry County**
22 **Council**: In reviewing the Shannon LNG project, the
23 Manager' s Report notes the Plan states that in general
24 land zoned for industrial use will be located within
25 urban zone and the Council recognises that coastal zone 15: 34
26 is a vital asset with limited capacity to absorb
27 development. However, the Plan also notes that for
28 strategic locational reasons there are instances where
29 lands outside of urban areas may be zoned for

1 industrial purposes.

2

3 The Manager's Report notes that the County Development
4 Plan includes the following reference:

5

15: 34

6 "Section 5.2.9: Lands have been
7 identified at Ballylongford/Tarbert as
8 suitable for development as a premier
9 deep water port facility and for major
industrial development and employment
creation."

10 In considering views and prospects the Report notes 15: 34
11 that the Plan does not give rise to the prohibition of
12 development, but that development, where permitted,
13 should not seriously hinder or obstruct these views and
14 should be designed and located to minimise their
15 impact. 15: 35

16

17 In discussing the location of the tanks the Report
18 states that *the planning authority is satisfied that*
19 *locating the tanks on the eastern portion of the site*
20 *reduces the need for processed pipe work, excessive 15: 35*
21 *jetty construction and minimises the visual impact on*
22 *the surrounding landscape through screening by more*
23 *elevated ground to the south.*

24

25 In discussing the visual impact and landscape 15: 35
26 assessment the Report notes that the planning authority
27 accepts that for technical, economic and operational
28 reasons the location chosen for the tanks is the
29 optimum location within the site. It has further

1 considered that minor structures and process equipment
2 will not have significant visual impact and that the
3 primary aspect of visual impact will centre on the
4 tanks and the jetty.

15: 35

5
6 The Reports notes the range of slight to significant
7 visual impact associated with the project. However, in
8 considering its context the Report goes on to recognise
9 the existence and significance of existing developments
10 on the coastline of the estuary, including Aughinish 15: 35
11 Alumina, Money Point and Tarbert Power Stations. The
12 Report considers that in the context of the existing
13 environment the development will not alter the
14 population's image of the estuary or the landscape and
15 state that the *construction of the proposed development* 15: 36
16 *will not therefore be a precedent and will not*
17 *constitute a development encroaching on a pristine*
18 *unspoiled landscape.*

19
20 In relation to views and prospects the planning 15: 36
21 authority considers that, as required in section 11.4.1
22 of the Development Plan, the proposed development does
23 not seriously hinder or obstruct these views. When
24 viewed from these locations it is considered that the
25 development, while clearly visible, does not dominate 15: 36
26 the landscape due to the distance from the development,
27 the angle of view available and given the context of
28 existing development in the area.

1 In summary, the planning authority notes that there is
2 significant visual impact arising from the development.
3 The planning authority also notes that the landscape on
4 which it is situated is not highly sensitive or scenic;
5 that there is precedence for other development of 15: 36
6 significant scale in the vicinity; that the image value
7 of the estuary will not be altered; and that the
8 proposed development is not located on land with an
9 amenity designation but rather it is zoned industrial.

10
11 The Report also notes that the planning authority
12 considers the mitigation measures provided, while not
13 screening the development, has given consideration to
14 landscape and visual impact issues.

15
16 The Reports states that it is clear that *the County*
17 *Development Plan envisages and facilitates major*
18 *industrial development at this location. The planning*
19 *authority considers that this zoning is in accordance*
20 *with the provisions of the Development Plan and is not 15: 37*
21 *inconsistent with the objectives regarding landscaping*
22 *listed above.*

23
24 **Conclusion:** The proposal envisages the provision of a
25 major industrial development on an open estuarine 15: 37
26 landscape. The development will give rise to landscape
27 and visual impacts for properties and viewers in areas
28 immediately south, south-west and west of the site, and
29 for those on the immediate north shore of the estuary.

1 The Shannon Estuary is an important landscape resource.
2 However, it is also a commercial resource and the
3 setting for some of the largest infrastructural
4 industrial developments in the country. Developments
5 such as Money Point and Tarbert Island generating 15: 38
6 stations, and Aughinish Alumina further east, are
7 already physically and visually prominent industries on
8 the estuary and amongst the primary aspects of visual
9 reference in the wider landscape.

10
11 The proposed development is lower in height than some 15: 38
12 of the existing developments; nevertheless its
13 prominent visual mass will result in significant visual
14 impact. However, negative landscape and visual impacts
15 must be considered against the wider significance of 15: 38
16 the proposed development; its specific locational
17 requirements; the appropriate zoning of the site; the
18 presence of other large prominent developments in the
19 locality; and the appreciation that any significant
20 development with associated deep water jetty is likely 15: 38
21 to give rise to similar landscape and visual impacts on
22 this open site.

23
24 In conclusion, it is accepted that the proposed Shannon
25 LNG project will, as may be expected, give rise to 15: 39
26 landscape and visual impact. However, given its
27 specific requirements, the siting of the facility on
28 industrial zoned lands in the vicinity of other
29 significant developments is appropriate and in overall

1 consideration will not give rise to seriously adverse
2 negative landscape and visual impact.

3
4 END OF SUBMISSION

5
6 **INSPECTOR:** Thank you, Mr. Burns. It
7 is 3:40 so maybe we will
8 take a five minute break.

9 **MR. J. McELLI GOTT:** Could I just make a quick
10 comment. Johnny
11 McElligott, Killorgan Residents Association. Just
12 before the land was rezoned in March 2007 -- it was
13 rezoned specifically for this project -- the zoning of
14 the land was Rural Secondary Special Amenity. So, I am
15 just going to read out how the Kerry County Development
16 Plan viewed this actual site just before it was rezoned
17 from Secondary Special Amenity. It says at 11.2.8:

18
19 "The landscape of areas in this
20 designation is generally sensitive to
21 development. Accordingly, development
22 in these areas must be designed so as
23 to minimise the effect on the
24 landscape. Proposal designs should
25 take account of the topography,
26 vegetation, existing boundaries and
27 features of the area. Permission will
28 not be granted for development which
29 cannot be integrated into its
30 surroundings. Residential development
31 will be considered for people wishing
32 to establish a primary place of
33 residence in accordance with the
34 provisions of section 3.3.7 of this
35 plan."

36
37
38 Now, I would just like to point out to the Inspector
39 that we have appealed to the European Union Parliament

1 Petitions Commission that this place was rezoned
2 illegally. But, in any case, just because the site was
3 rezoned industrial specifically for this project only
4 in March 2007 from Secondary Special Amenity it does
5 not change its landscape characteristics. The Council 15: 41
6 is suddenly viewing this site in a completely different
7 light, whereas less than a year ago it saw it
8 completely differently.

9
10 The second point is that I visited the site in Milford 15: 41
11 Haven and the valves that are on top of the dome extend
12 for 10m above that. Now, if you have ever visited the
13 George Pompidou centre in Paris you see all the pipes
14 and valves that are outside that building and 10m
15 equate to roughly two bungalows, including the roofs, 15: 41
16 one on top of the other. So, if you can imagine the
17 valves and everything that are the equivalent of two
18 bungalows, one on top of the other, on top of the dome
19 I would actually ask the Inspector to look at the plans
20 and try and integrate that idea to the photomontages at 15: 41
21 a closer level when he looks at the photomontages in
22 detail later. Thank you very much.

23 **INSPECTOR:** Okay, Mr. McElligott. Can
24 you just give me the
25 section of the Development Plan that you were quoting 15: 42
26 from there?

27 **MR. J. McELLI GOTT:** It is the Kerry County
28 Development Plan 2003-2009,
29 section 11.2.8, page 157.

1 INSPECTOR: Thank you. Mr. O'Neil,
2 there is a model of the
3 tanks, is there?
4 MR. O'NEILL: Yes, I believe there is,
5 and that can be made 15: 42
6 available after the break. I suspect it is probably in
7 the EIS but I will get a loose copy of that in any
8 event.
9 INSPECTOR: Okay, we will take that
10 five minute break now. 15: 42
11 Thank you.
12
13 SHORT ADJOURNMENT.
14
15 15: 55
16 THE HEARING RESUMED AFTER A SHORT ADJOURNMENT AS
17 FOLLOWS
18
19 INSPECTOR: Okay everybody, I think we
20 have had a five minute 15: 55
21 break, perhaps if you could resume your seats please.
22 MR. O'NEILL: I will just go and get our
23 people.
24 INSPECTOR: Mr. O'Neil, are you ready
25 to commence? 16: 00
26 MR. O'NEILL: Yes, Sir, and thank you.
27 I am handing out, more
28 copies are being made at the moment, one of the figures
29 from the EIS, figure 3.14, which shows a cross section

1 of one of the tanks with the dimensions on it and also
2 the height of the vent above base. As you will see the
3 vent is 10 metres higher than the top of the tank --
4 sorry, eleven metres higher than the top of the tank.
5 61.5 metres as against 50.59. The vent pipes are over 16:01
6 the top left-hand corner.

7 **INSPECTOR:** Right.

8 **MR. O'NEILL:** I don't know if any
9 explanation is needed other
10 than what I have given you, Sir. More copies are being 16:01
11 made at the moment and will be left on the desk so
12 people can pick them up if they want or left on the
13 table. My next witness is Colin Doyle who is going to
14 deal with noise and vibration.

15
16 **MR. DOYLE ADDRESSED THE ORAL HEARING AS FOLLOWS**

17
18 **MR. DOYLE:** Inspector, you have a copy
19 of my presentation and
20 I propose presenting a shortened version, if that's all 16:01
21 right.

22 **INSPECTOR:** Thank you.

23 **MR. DOYLE:** My name is Colin Doyle.
24 I graduated from Trinity
25 College Dublin with an honours degree in experimental 16:02
26 physics in 1979 and obtained an MSc from Trinity
27 College in 1982 by researching the subject of
28 environmental radioactivity. I hold a postgraduate
29 diploma in pollution management from the University of

1 Staffordshire. I am a member of the Institute of
2 Acoustics.

3
4 I am an environmental consultant with ANV Technology
5 and director of the company. ANV Technology was 16:02
6 established in 1995 and provides measurement and
7 consultancy services in the areas of noise, vibration
8 and air quality.

9
10 My main areas of expertise are noise, vibration, air 16:02
11 quality and computer modelling of noise propagation and
12 dispersion of pollutants in the environment. I have
13 over 25 years experience in environmental science, of
14 which 18 years were in the areas of noise and
15 vibration. I have carried out Environmental Impact 16:02
16 Assessments for in excess of 60 development projects.
17 My evidence will deal with noise and vibration aspects
18 of the proposed development both during the
19 construction phase and operational phase.

20 16:03
21 ANV Technology was appointed to carry out a noise and
22 vibration impact assessment of the proposed Shannon LNG
23 Terminal. The scope of work included baseline surveys
24 to determine the existing noise environment, computer
25 modelling of noise levels during the construction phase 16:03
26 and operational phase and specification of mitigation
27 measures. I am going to skip over methodology,
28 Inspector, which is described in the EIS.

29

1 **Reporting.** The complete results from the baseline
2 surveys studies, noise modelling and impact assessment
3 were presented in a noise impact assessment report
4 which was prepared by ANV Technology for this project.
5 The assessment is presented in the EIS volume 2 section 16:03
6 9.

7
8 I am going to skip over the noise terminology which is
9 for background reading and I am going down to the
10 second last paragraph on page 3. 16:04

11
12 Operational noise emissions from industrial sites are
13 subject to noise limits applied by the Environmental
14 Protection Agency. These limits are 55 decibels during
15 daytime and 45 decibels during nighttime. The limits 16:04
16 apply at noise sensitive locations, which in this case
17 are the houses in the vicinity of the site. It is
18 expected that these noise limits will be included as
19 conditions in the licensing of the proposed Shannon LNG
20 site by the Environmental Protection Agency. 16:04

21
22 For construction noise there are no national noise
23 limits. However, the National Roads Authority has
24 published guideline limits for road construction works
25 which can validly be applied to other construction 16:04
26 projects. The National Roads Authority guidelines
27 propose a noise limit of 70 decibels during daytime at
28 houses with lower limits applicable in the evening and
29 weekend periods. In cases where nighttime works are

1 necessary, further limitations on noise emissions will
2 be required as considered appropriate to minimise
3 impact, taking appropriate account of the duration of
4 the activity.

5
6 The noise and vibration assessment included a baseline
7 study which is described in the EIS and I propose to
8 move on to section 3.1 of my statement.

9
10 **Noise During Construction Phase.** In the early site 16:05
11 preparation phase there will be significant noise
12 generation on site due to site clearance and rock
13 excavations. The rock excavation works were modelled
14 as a small quarry. Details of the predicted
15 construction noise levels are presented in the EIS 16:05
16 volume 2 section 9.5.1.4. The resulting noise level at
17 the nearest house was calculated to be in the range of
18 44 to 47 decibels. This is comfortably within the
19 standard 70 decibel construction noise criterion and
20 the noise impact will be slight. 16:06

21
22 At houses on the coast road, the calculated
23 construction noise level is in the range 38 to 51
24 decibels and the impact will be negligible to slight.

25 16:06
26 In addition to the steady noise from the site, there
27 will also be construction traffic noise levels
28 experienced at the houses along the coast road of level
29 52 decibels. The construction traffic noise will be 7

1 decibels higher than the existing traffic noise.
2 However, the overall traffic noise level will still be
3 relatively low and the impact will be slight. For
4 construction traffic on the road network (N69, R551 and
5 R552 and Tarbert) beyond the coast road the relative 16:06
6 impact will be less with a predicted increase of just
7 one decibel which is negligible. The traffic noise
8 impact assessment is presented in the EIS volume 2
9 table 9.7.

10
11 Construction noise levels in the Candidate Special Area
12 of Conservation and Proposed National Heritage Area
13 adjacent to the site will be in the range 45 to 51
14 decibels with negligible impact. 16:07

15
16 During the subsequent facility construction phase,
17 noise levels will be significantly lower with
18 negligible impact. 16:07

19
20 There will be a necessity for nighttime works in 16:07
21 connection with construction of concrete tanks. There
22 will also be nighttime works nearby at the jetty area
23 due to tidal restrictions. The resulting noise levels
24 at the nearest house can readily be controlled to less
25 than 45 decibels using standard noise mitigation 16:07
26 measures. These works will be of limited duration and
27 the noise impact will be slight to moderate.

28
29 Regarding construction phase vibration and blast

1 overpressure. These are described in the EIS and
2 I will summarise these issues when I discuss
3 mitigation. So I turn over to page 6.

4
5 Under the heading **Operational Phase Noise**, this is 16:08
6 described fully in the EIS section 9.5.2.1. I will
7 just summarise the main finding which is the third
8 paragraph in section 3.4.

9
10 The predicted operational noise levels are presented in 16:08
11 the EIS volume 2, table 9.9. At Rallapane House, which
12 is the nearest noise sensitive location, the noise
13 model indicates that an operation noise level 20
14 decibels lower than EPA daytime level and 10 decibels
15 lower than the EPA nighttime level will be technically 16:08
16 achievable. The noise from the facility will be close
17 to the existing nighttime background noise. The impact
18 will be negligible. At the nearest houses along the
19 coast road, the calculated operational noise level
20 ranges from 23 to 30 decibels with negligible impact. 16:09

21
22 I turn now, Inspector, to the mitigation on page 7
23 which is summarised in section 3.5.

24
25 During the construction phase the environmental 16:09
26 management plan will include assessment and control of
27 the noise in accordance with BS5228 which is titled
28 "Noise and Vibration Control on Open and Construction
29 Sites". This will ensure that daytime construction

1 noise limits are comfortably complied with. Any
2 nighttime works will be carefully assessed in advance and
3 controlled to ensure that the guideline nighttime noise
4 limit is not exceeded.

16:09

5
6 Blasting will be designed and controlled to ensure that
7 guideline limits for protection against cosmetic damage
8 are comfortably complied with at the nearest
9 residential properties.

16:10

10
11 A detailed method statement will be drawn up by an
12 ecologist and agreed with the National Parks and
13 Wildlife Service prior to commencement of works. The
14 method statement will specify the timing of blasting
15 operations and the need, if any, for ecological
16 supervision. Noise and vibration monitoring will be
17 carried out during the construction phase, including
18 acoustic monitoring of dolphin activity as stated in
19 the EIS volume 2 section 9.6.2 and in the statement
20 which will be presented by Dr. Simon Berrow.

16:10

16:10

21
22 The facility will be designed to minimise noise
23 emissions and will incorporate standard noise
24 mitigation measures such as enclosures, silencers,
25 screens to ensure that the resulting noise levels at
26 the nearest house are comfortably within EPS guideline
27 noise limits.

16:10

28
29 I would like to reply now to the submissions that were

1 made to An Bord Pleanála concerning noise aspects.

2
3 Firstly, the submission by Catriona Griffin, reference
4 L016. This submission raises concerns over
5 construction traffic noise, rock blasting and noise 16: 11
6 associated with 24 hour per day construction works.
7

8 **Response:** As detailed in the EIS volume 2 table 9.7,
9 the calculated construction traffic noise level at
10 houses on the coast road is 52 decibels. This is a 16: 11
11 relatively low traffic noise level and the impact will
12 be slight. As stated in the EIS volume 2 section
13 9.5.1.7, noise from blasting will be subject to
14 standard EPA limits regarding blast overpressure and
15 will have no adverse impact at houses in the locality. 16: 11
16 The period during which 24 hour working will occur will
17 be relatively limited in duration over the four year
18 construction period and was covered in the testimony of
19 Leon Bowdoin and Ian Vinecombe.

20 16: 12
21 Submissions by Kathleen Kelly L002; John C. Foley,
22 L013; Patrick Griffin, L015. The issue of noise and
23 disruption was mentioned in these three submissions.
24

25 **Response:** The detailed noise impact assessment 16: 12
26 indicates that construction noise from the development
27 site and from construction traffic will be comfortably
28 within acceptable standards during the construction
29 phase.

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Submission by Raymond and Margaret O'Mahony, L043.
Their submission claims that they will never hear the sea from their house if the project proceeds.

16: 12

Response to that is: Under typical weather conditions with for example a light to moderate breeze the natural wind and wave noise will continue to be the main audible feature in the locality. Noise from the proposed facility will be lower in magnitude. Under higher wind conditions wind noise dominate. In general, therefore, the additional noise from the facility will have negligible impact on the existing background noise levels.

16: 13

16: 13

Submission from Kerry County Council. In section 5.6 of this submission it is requested that noise monitoring during the construction phase should be a condition of planning and that mitigation measures should be approved by the local authorities. Shannon LNG agrees with this comment. Noise monitoring and mitigation during the construction phase required by Kerry County Council will be carried out in accordance with the methodology of BS5228 as stated in the EIS volume 2 section 9.6.

16: 13

16: 13

Finally, I would just like to conclude: During the construction phase noise levels will be comfortably within acceptable criteria; construction traffic will

1 have a negligible to slight noise impact; blast
2 vibration and overpressure will be subject to standard
3 limits and blasting will be planned in conjunction with
4 ecologists to minimise the potential impact on
5 wildlife; noise modelling indicates that the facility 16: 14
6 can operate comfortably within the applicable EPA noise
7 limits and lower than existing average background noise
8 levels.

9
10 Overall, it is concluded that for a facility designed 16: 14
11 and built in accordance with the noise criteria
12 described in the EIS, there will be negligible impact
13 on the existing noise environment and comfortable
14 compliance with Environmental Protection Agency limits
15 during daytime and nighttime. The noise impact will be 16: 14
16 negligible and that concludes my statement.

17
18 END OF SUBMISSION OF MR. DOYLE

19
20 **INSPECTOR:** Thank you, Mr. Doyle. 16: 14

21 I wonder could you explain
22 for the benefit of all what the situation will be in
23 relation to the actual operation, and I am talking
24 about in the event of permission being granted and the
25 operation being subject to an IPPC licence, can you 16: 15
26 just explain what rights of input people would have on
27 that?

28 **MR. DOYLE:** What rights of input?

29 **INSPECTOR:** Yes.

1 MR. DOYLE: I think that's probably a
2 legal matter.

3 INSPECTOR: Do you wish to answer that?

4 MR. O'NEILL: Yes, I would like to
5 consider that. I don't 16: 15
6 want to give an off-the-cuff answer to that, but I will
7 consider and address you on that, Sir.

8 INSPECTOR: Okay.

9 60 Q. MR. McELLI GOTT: Mr. Inspector, Raymond
10 O'Mahony in an oral 16: 15
11 submission here on Monday, I think it was, described
12 how if a tractor or a machine drives by on the road the
13 articles on the mantelpiece in his house shake. The
14 reason given was that when he was building his house
15 the engineers said that his house was on the same 16: 15
16 stretch of rock from his house down to the coast so
17 what effect will the vibrations of the construction
18 phase have on his house would you think, Mr. Doyle?

19 A. MR. DOYLE: The activities on the site
20 which might generate 16: 16
21 significant vibration would be blasting and that's
22 dealt with in the EIS. That would be subject to blast
23 vibration limits which are set out by the EPA. My
24 estimate is that ground vibration levels at the nearest
25 house, which would be Rallapane House, would be less 16: 16
26 than 2 million metres per second blast vibration.

27 61 Q. Given the new information that Raymond gave on Monday
28 where he described even machines about 150 metres away
29 would have an effect, and that's just a tractor, he

1 said, so if you are having heavy blasting on a rock
2 face further down it will go right up -- it's like if
3 you hit a hard board, the vibration will carry on, if
4 I bang the table over there the vibration would be felt
5 at the other end so I imagine it must be the same on 16:17
6 rock, would it not?

7 A. I can't comment on the particular local circumstance of
8 that house, but it would be common knowledge and common
9 practice that quarries blast throughout the country on
10 a rock stratum which continues underneath the nearby 16:17
11 houses and the limits have been set taking that into
12 account so they are technically achievable.

13 62 Q. Will his house still be standing after that?

14 A. Absolutely. The vibration limits which are set by the
15 EPA, and which are the same practically in all 16:17
16 countries and the UK, are for protection against
17 cosmetic damage, which refers to slight cracking of
18 paint work. There is no question of structural damage
19 at these values.

20 63 Q. His insurance company said that they will not be liable 16:17
21 for any damage done by Shannon LNG in the blasting
22 works so will you guarantee that you will be viable for
23 any work or any damage your work does to his house?

24 **MR. O'NEILL:**

That's again a legal

matter, Sir. I think 16:18

25
26 that's a matter that should be taken up by the house
27 owner rather than Mr. McElligott. If there is damage
28 caused to a house by activities carried on by Shannon
29 for which there is legal responsibility Shannon even if

1 they wanted to couldn't get out of its legal
2 liabilities.

3 **MS. O' MAHONY:** I am Raymond O' Mahony's
4 mother and Johnny
5 McElligott is our spokesperson so if he doesn't speak 16:18
6 for us what do you expect, he is the one asking you the
7 question.

8 **MR. O' NEILL:** I note that and I think
9 I have answered the
10 question. If you want clarification I will certainly 16:18
11 give you that, but what I indicated was that if damage
12 is caused by Shannon LNG blasting or blasting carried
13 out on their behalf for which they have a legal
14 liability that is something they must address. It's
15 difficult to see, having regard to the requirements and 16:19
16 the standards that will be set in relation to blasting,
17 how there can be any possibility of damage. The house
18 is approximately 1,000 metres away from the
19 ... (INTERJECTION)

20 **MS. O' MAHONY:** 800 metres. 16:19

21 **MR. O' NEILL:** Sorry, 800 metres from the
22 vicinity. The tractor we
23 were talking about is 150 metres or so away, I think a
24 big difference. Clearly if damage is caused it's a
25 matter that has to be addressed by Shannon LNG and 16:19
26 Shannon LNG is not going to try to escape from any
27 responsibilities it has.

28 **MS. O' MAHONY:** Thank you.

29 **MR. McELLI GOTT:** The second question is:

1 I once lived in a war zone
2 and I used to hear all the explosions and ever since
3 when I hear explosions going on like even fire crackers
4 or fireworks I find it very frightening. Will Shannon
5 LNG compensate people if they suffer mental stress from 16: 20
6 all the blasting because I understand the effect that a
7 sudden blast will have on people. Some people might
8 not be able to cope with all that especially if you are
9 going to be having construction works going on for ten
10 years, it seems like a very long time. 16: 20

11 **MR. O'NEILL:** I am afraid that is
12 something the Supreme Court
13 has addressed, there is a limit to operators'
14 liabilities. If there is a liability obviously it has
15 to be addressed; if there is not a liability Shannon is 16: 20
16 not going to obviously assume a liability which it
17 would not otherwise have. My understanding is that in
18 the short period during which blasting will take place,
19 a short period relevant to the operation of the
20 facility, that there will be prior notification and 16: 20
21 consultation.

22 **MR. McELLI GOTT:** Thirdly, I notice that
23 whenever I sleep on the
24 coast road in my family's house, I could be there from
25 two to five or o'clock or six o'clock and I wouldn't 16: 20
26 hear a car passing and all I will hear at night is the
27 curlew. I noticed in your Environmental Impact
28 Statement that the curlews will probably disappear from
29 the area around the site proposal and also there is a

1 bit of curlew migration from Ballylongford Bay over
2 towards Tarbert Bay and the Department of the
3 Environment has asked for further clarification on the
4 effect of migration between these two special areas of
5 environmental interest. Have you considered the effect 16: 21
6 you are going to have on the bird life? When I say
7 that all I can hear is the curlew at night when I am
8 sleeping there it's really to bring home the point to
9 all of you that when you are talking about acceptable
10 levels of noise in a rural area, but this coast road, 16: 21
11 especially since a lot of the people left, has got much
12 quieter and most people now travel the upper road and
13 for you to say that it is acceptable, it's a very
14 subjective matter because when you have no noise at all
15 you can hear a car coming from Tarbert for about two or 16: 22
16 three miles away, two miles anyway, you can hear it
17 coming so I just want to get across to you the idea
18 that for you to say it's acceptable in a rural context
19 it depends on where in the rural context you are
20 talking about so have you addressed that correctly? 16: 22

21 **MR. O'NEILL:** I think that will be
22 addressed during the
23 ecology session we are going to have on Monday.

24 **MR. McELLI GOTT:** No, it is noise, it is
25 actually noise so I would 16: 22
26 like to get the expert, Mr. Colin Doyle's opinion, on
27 how he distinguishes between different levels of noise
28 in different contexts and how he is able to define this
29 specific area as compared to other rural areas and,

1 secondly, the effect of the noise that I am going to
2 miss in the future is the migration birds.

3 **MR. O'NEILL:** The impact on wildlife is
4 something that will be
5 dealt with on Monday. I am not trying to avoid your 16: 22
6 question at all, but I think it may be better asked of
7 the appropriate experts on Monday.

8 **MR. McELLI GOTT:** That's about the birds.
9 What about the question
10 I asked of how would you compare different rural areas? 16: 23

11 **MR. DOYLE:** I can answer that.
12 Firstly, the existing noise
13 environment is described in the EIS and the areas is
14 described as 'quiet rural' which concurs with what you
15 have said. In terms of acceptability, during the 16: 23
16 construction phase it is accepted generally that
17 construction activities will necessarily involve
18 generation of some noise and for that reason the
19 criterion that is considered acceptable during the
20 construction phase is 70 decibels for ordinary 16: 23
21 construction projects. The calculated noise level at
22 the nearest house is significantly lower than that
23 criterion and on that basis I say that the impact will
24 be slight.

25
26 Regarding the operational noise, all industrial
27 activities will generate some process noise, some
28 degree of process noise. In a quiet rural area the
29 point you are making is that 'will this have greater

1 impact', I presume. Now, that has been addressed in
2 the EIS where we have presented a table of the
3 predicted noise level and we compare it with the
4 background noise level that was measured at the site
5 and the predicted noise level at nighttime from the 16: 24
6 proposed facility is comparable to the existing average
7 background noise level.

8 **MR. McELLI GOTT:** Especially at night,
9 I would have to disagree
10 that at night. You can hear almost a pin drop on the 16: 24
11 road so that any work whatsoever at night is a complete
12 invasion of people's well-being, I need to get that
13 across, that at nighttime it is just so quiet, that's
14 all.

15 **INSPECTOR:** It is my intention really 16: 24
16 to allow the Applicants to
17 continue their presentation. I would just ask one
18 question myself, and I didn't really intend to open it
19 up. Mr. O'Neill, do you wish to present your next
20 speaker. 16: 25

21 **MR. O'NEILL:** The next speaker is Musetta
22 O'Leary who is going to
23 speak to archaeology and cultural heritage.

24
25 16: 25

26
27
28
29

1 MS. O' LEARY ADDRESSED THE ORAL HEARING AS FOLLOWS

2
3
4 MS. O' LEARY: Inspector, I propose to
5 read a slightly shortened 16: 25
6 version of my witness statement and I will refer to the
7 relevant areas as I read through it.

8
9 **Qual i fi cations and Experi ence.** My name is Musetta
10 O' Leary and I hold a Bachelor of Arts Degree (1998) and 16: 26
11 a Masters Degree (2000) from the National University of
12 Ireland Cork. I am associate member of the Institute
13 of Archaeologists of Ireland. I have worked with
14 Sheila Lane & Associates since June 2001. My position
15 in the company is that of coordinator of all road and 16: 26
16 large EIS projects undertaken by the office. I have
17 been involved in the compilation of a number of
18 Environmental Impact Statements for a wide range of
19 developments that include the following: **Road Projects**
20 such as the N6 Athlone to Kinnegad; the N5 Charlestown 16: 26
21 Bypass; N24 Carrick-on-Suir bypass; N22, Tralee bypass,
22 Tralee to Bealagrealagh; N17, Galway to Tuam Road.
23 Wind energy projects include Curraheen and Kill-Hill in
24 Co. Tipperary and Foiladaun in Co. Cork and other
25 various industrial, housing and mixed use developments 16: 27
26 throughout the Munster region.

27
28 Before joining Sheila Lane & Associates, I worked with
29 the Cork Archaeological Survey, National University of

1 Ireland, Cork, with responsibility for compiling an
2 archive of the Record of Monuments and Places of
3 Co. Cork.

4
5 Sheila Lane & Associates was formed in 1998 and has 16: 27
6 achieved considerable growth since that date. The
7 company principal is Sheila Lane who is a licensed
8 archaeologist with over 30 years experience in
9 archaeological consultancy, urban and rural excavation,
10 research and surveying. The company comprises a core 16: 27
11 group of seasoned archaeologists with experience in
12 different areas dating from the Neolithic through to
13 the Post Medieval Period.

14
15 Sheila Lane & Associates has carried out a large 16: 28
16 proportion of the archaeological work in the Cork area
17 over the past ten years. The company has been involved
18 in numerous environmental impact projects throughout
19 the country. In some cases these Environmental Impact
20 Statements have been brought from the initial site 16: 28
21 selection phase through to oral hearing and
22 pre-development testing phase. The company has worked
23 for Cork County Council on a number of projects such as
24 road widening and monitoring. In the past number of
25 years the company has been involved in many road 16: 28
26 projects such as the Watergrasshill bypass from the
27 initial desktop stage to final design and build phase.
28 Archaeological excavation of three large medieval urban
29 Cork City sites have been undertaken by the company in

1 the past four years.

2

3 Sheila Lane & Associates involvement in the project.

4 Sheila Lane & Associates was retained by Shannon LNG to

5 assess the archaeological, architectural and cultural 16: 28

6 heritage impacts of the proposed Shannon LNG Terminal.

7 The potential impacts during the construction phase and

8 during the operational phase were considered and

9 appropriate mitigation measures were recommended to

10 ameliorate these impacts. 16: 29

11

12 In the EIS the term cultural heritage encompasses the

13 following topics: Archaeology, folklore,

14 tradition/history, architecture settlement, monuments

15 and features. The archaeological, architectural and 16: 29

16 cultural heritage section of the EIS, chapter 14, was

17 compiled in accordance with the most recent EPA

18 guidelines 2002 to 2003 and guidelines issued by

19 Dúchas, now the National Monuments Service at the

20 Department of the Environment, Heritage and Local 16: 29

21 Government. Consultations with the National Monuments

22 Service and the County Archaeologist for Kerry were

23 ongoing throughout the compilation of this EIS.

24

25 The purpose of my evidence. The purpose of my evidence 16: 29

26 is to provide an overview of the receiving

27 archaeological and cultural heritage environment of

28 this proposed development. My principal points of

29 evidence will cover: Methodology, impact, and

1 mitigation.

2
3 **Methodology.** I conducted the following phases of
4 assessment as part of Sheila Lane & Associates scope of
5 works: 16: 30

6
7 I propose to just summarise each stage of that
8 methodology. An extensive desk stop survey of the
9 proposed development site and an area within two
10 kilometre radius of the proposed development site, 16: 30
11 figure 14.1 volume 3.

12
13 Consultations took place with people in the area with
14 knowledge of local history in July 2006 and again in
15 April 2007. 16: 30

16
17 Field inspections were carried out to identify new and
18 potential cultural heritage sites within the proposed
19 development area and to verify the condition of known
20 cultural heritage sites. 16: 30

21 An aerial survey of the proposed development site was
22 carried out by Sheila Lane & Associates on 14 August
23 2006. An archaeological geophysical survey
24 commissioned by Sheila Lane & Associates was carried
25 out by Target Archaeological Geophysics between 3 and 16: 31
26 10 October 2006.

27
28 In August 2006 a Marine Geoarchaeological survey,
29 commissioned by Sheila Lane & Associates, was carried

1 out by maritime archaeologist Mr. Donal Boland.
2 Continuing on on page 5.

3
4 In November 2006 Sheila Lane & Associates carried out
5 archaeological monitoring of engineering trial pits, 16: 31
6 volume 4 appendix 14G. In April 2007, following on
7 from production of a final scheme for the site, a final
8 maritime archaeological report was produced by maritime
9 archaeologist Mr. Donal Boland.

10 16: 31
11 Now, upon completion of these assessments I compiled
12 the section of the EIS dealing with archaeological,
13 architectural and cultural heritage, section 14.

14
15 **The Main Findings.** The identified constraints within 16: 32
16 the entirely proposed development site are detailed
17 below summarised in table 14.2 volume 2 and shown on
18 figure 14.12 volume 3. All culture heritage sites and
19 potential cultural heritage sites were assigned to
20 cultural heritage site numbers. Findings of the marine 16: 32
21 geoarchaeological surveys and the mitigation to be
22 implemented will be summarised by marine archaeologist
23 Mr. Donal Boland. The main findings:

24
25 There is one recorded archaeological site, a ringfort 16: 32
26 (CHS10) within the proposed development site. A buffer
27 zone will be established around this site where no
28 development will take place.

1 Twelve cultural heritage sites and potential cultural
2 heritage sites were identified during field
3 inspections.

4
5 Moving on to page 6. Consultation with people in the 16: 32
6 area identified two features of local cultural heritage
7 interest. The next: Six potential archaeological
8 sites (Areas B, C, D, E, F and H) were identified
9 during aerial flyover. An additional five potential
10 archaeological sites (Area areas I, J, K, L and N) were 16: 33
11 identified from OS Ordnance Survey aerial photographs
12 taken at 20,000 feet. An archaeological geophysical
13 survey of selected areas within the proposed
14 development site identified four areas of
15 archaeological potential, areas, 6, 8, 10 and 13. 16: 33

16
17 Now, development will take place on the eastern side of
18 the proposed development site as outlined on figure
19 14.12 volume 3. Eight of the above sites (CHS 1, 3, 8,
20 11, 12, 15 and areas D and E) lie outside this area and 16: 33
21 will not be impacted by the proposed development.

22
23 The predicted impacts of the proposed development. The
24 ringfort (CHS 10) is situated alongside the eastern
25 boundary of the proposed development. Field inspection 16: 34
26 confirmed that there is no above ground evidence of
27 this site. No evidence for the site was identified
28 during the aerial survey. The geophysical survey
29 identified a curvilinear feature (a possible ditch) and

1 in turns features associated with the ringfort (Area
2 17). The proposed development has been designed to
3 avoid impacting this ringfort.
4

5 The proposed development will impact on the following 16: 34
6 outstanding structures identified during field
7 inspection: Three farm complexes, (CHS 4, 2 and 9); a
8 well, (CHS 6); a gun placement (CHS 7); partial remains
9 of a structure, (CHS 15). The proposed development
10 will impact on ten possible archaeological features: 16: 34
11 CHS 5 and areas B, C, F, I, J, K, L, N and area 8 and
12 three areas of possible archaeological potential, areas
13 6, 10 and 13.
14

15 The proposed development will impact on secular well, 16: 35
16 Tubberagl eanna, (CHS 13). A number of fields (4, 8,
17 18, 20, 26, 33, 51 and 57) within the area, that's
18 shown on figure 14.13 volume 3, proposed for
19 development contain a typical environment in which
20 fulachta fiadh may be found. These fields are 16: 35
21 considered to be areas of archaeological potential.
22

23 The proposed development impact on the stream also (a
24 town land boundary) running northwest through the
25 development site. It is proposed to impound the stream 16: 35
26 at one site forming a pond. The stream bed and banks
27 will be impacted in this area.
28

29 The proposed development will entail the removal of top

1 soil and a substantial amount of ground reduction.
2 Where extensive earth working is involved there is
3 always the possibility that previously undetected
4 subsurface archaeological remains will be revealed.

16: 36

5
6 **Mitigation Measures.** Given the scale of the proposed
7 development, an extensive programme of pre-development
8 licensed archaeological testing will be undertaken in
9 the eastern half of the site where the initial
10 development will take place. Testing will comprise of 16: 36
11 linear trenches ten metres apart throughout the areas
12 where topsoil will be removed. These areas likely to
13 be stripped of topsoil are coloured yellow on figure
14 14.12, volume 3. This testing strategy has been agreed
15 with the National Monuments Service at the Department 16: 36
16 of Environment, Heritage and Local Government and the
17 County Archaeologist of Kerry. Following the
18 completion of archaeological testing, a report will be
19 compiled on the results incorporating recommendations
20 for further archaeological intervention such as 16: 36
21 excavation as required. The programme of
22 archaeological testing will be followed by a full
23 archaeological resolution, that is complete excavation
24 of the features identified before construction
25 commences. 16: 37

26
27 Archaeological excavation will be carried out to a
28 professional standard as required by the Department of
29 the Environment, Heritage and Local Government and that

1 policy guidelines on archaeological excavation in the
2 Department of Arts, Heritage, Gaeltacht and the
3 Islands. When excavation is complete all post
4 excavation requirements will be fulfilled. This will
5 involve the compilation of a report on each site,
6 analysis by specialists of environmental remains and
7 finds covered as well as possible requirements for
8 dating and conservation.

16: 37

9
10 In the areas likely to be subjected to fill, those
11 areas coloured orange on figure 14.12 volume 3, and
12 areas which are not likely to be disturbed, green on
13 figure 14.12 volume 3, there will be no archaeological
14 testing as there will be no subsurface disturbance.

16: 37

15
16 Archaeological testing will be carried out outside the
17 western perimeter of the ringfort CHS 10. The results
18 of the testing will inform the size and extent of the
19 buffer zone around the ringfort. This buffer zone when
20 established will be fenced off and excluded from
21 development. A written photographic survey will be
22 made of all impacted structures listed in table 14.2,
23 volume 2 in advance of their removal.

16: 37

16: 38

24
25 A wading and metal detection survey will be carried out
26 a portion of the stream to be impacted by the
27 development. This will be agreed with the Underwater
28 Unit of the Department of the Environment, Heritage and
29 Local Government.

16: 38

1
2 Now, response to submissions to An Bord Pleanála.
3 Submission reference No. L018 Tarbert Development
4 Association: All archaeology should be protected and
5 no damage should be done to items of archaeological 16: 38
6 value. Submission: Reference No. L054, No. 55,
7 Killorgan Residents Association, all archaeological
8 sites to be protected.
9

10 **Response:** There is one known recorded archaeological 16: 39
11 site, a ringfort, (CHS 10) within the proposed
12 development site. A buffer zone will be established
13 around the ringfort within which no development will
14 take place. Archaeological testing will be carried out
15 outside the western perimeter of the ringfort. The 16: 39
16 results of the testing will inform the size and extent
17 of the buffer zone around the ringfort, thus preserving
18 any underground remains of this site in situ. The
19 buffer zone around the ringfort will be fenced off
20 prior to commencement of construction to avoid any 16: 39
21 impact.
22

23 Any archaeological remains identified during
24 archaeological testing will be preserved by record.
25 That is complete excavation of the features identified 16: 39
26 before construction commences. Preservation by record
27 is standard practice where preservation of
28 archaeological remains in situ is not feasible.
29 Preservation in situ of previously unknown

1 archaeological features is at the discretion of the
2 National Monuments Service. Archaeological excavation
3 will be carried out to professional standards as
4 required by the Department of the Environment, Heritage
5 and Local Government in their policy guidelines on 16: 40
6 archaeological excavation in the Department of the
7 Arts, Heritage, Gael tacht and the Islands.

8
9 Submission reference No. L031 Tarbert-Ballylongford
10 Working Group, Church Street, Tarbert. Heritage 16: 40
11 (archaeology etc.) to be protected during construction
12 phase.

13
14 **Response:** A buffer zone will be established around the
15 site of the recorded ringfort (CHS 10) and it will be 16: 40
16 fenced off and preserved in situ. Any archaeological
17 sites identified during archaeological testing will be
18 preserved by record following consultation with the
19 National Monuments Service.

20 16: 40
21 Submission reference No. L054 No. 23, Kilcolgan
22 Residents Association. Object to demolition of houses
23 because it is part of our cultural heritage.

24
25 **Response:** There are no protected structures within the 16: 41
26 proposed development site. Furthermore, none of the
27 buildings within the proposed development site were
28 recommended for protection by the National Inventory of
29 Architectural Heritage published in 2002. The

1 buildings within the proposed development site are of
2 local cultural heritage interest. A written and
3 photographic survey will be made of all impacted
4 structures listed in table 14.2 volume 2 in advance of
5 their removal, thus preserving them by record.

16: 41

6
7 Submission reference L051 from the Department of the
8 Environment, Heritage and Local Government. Targeted
9 archaeological testing should be done at areas of
10 archaeological potential and areas B, C, F, I, J, K, L,
11 M and 6, 8, 10 and 13. A wade and metal detection
12 survey of the water course, full record of areas CHS
13 13, 15, 2, 4, 5, 6, 7, 9 in advance of their removal.
14 Schedule testing to be done.

16: 41

15
16 **Response:** Consultation with the National Monuments
17 Service was ongoing throughout the compilation of our
18 report and all the above will be undertaken prior to
19 construction.

16: 42

20
21 Submission reference No. L056 page 30 from Kerry County
22 Council. Pre-development archaeological testing, as
23 previous agreed, should be carried out across the
24 proposed development site prior to construction. A
25 testing strategy should be agreed with the National
26 Monuments Service at the Department of the Environment,
27 Heritage and the Local Government as part of the
28 archaeological licensing process. Targeted
29 archaeological testing around the ringfort KE003-004

16: 42

16: 42

1 will be required to confirm the extent of the monument
2 prior to the placing of a 20 metre buffer zone.
3 Targeted testing of the anomalies identified in
4 geophysical assessment must also be undertaken.
5 Reports on these archaeological works should be 16: 43
6 submitted to the planning department of Kerry County
7 Council, Kerry County Archaeologist and the National
8 Monuments Service. Should significant archaeological
9 remains be uncovered during archaeology testing further
10 mitigation, that is full excavation and/or avoidance 16: 43
11 through redesign may be required.

12
13 **Response:** Consultation with the County Archaeologist
14 for Kerry was ongoing throughout the compilation of our
15 report and all the above will be undertaken prior to 16: 43
16 construction.

17
18 **Conclusion, the main points:** The recorded ringfort CHS
19 10 within the development site will not be impacted.
20 Comprehensive archaeological testing will be carried 16: 43
21 out prior to construction and any archaeological
22 remains identified will be fully resolved in
23 consultation with the National Monuments Service.
24 There are no protected structures within the proposed
25 development site. A written and photographic survey 16: 43
26 will be made of all impacted structures in advance of
27 their removal, thus preserving them by record.

28
29 I am of the view that the proposed development will not

1 have an adverse effect on the archaeological,
2 architectural and cultural heritage. It is my opinion
3 that the potential impacts of the proposed LNG terminal
4 development in terms of archaeological, architectural
5 and cultural heritage will be satisfactorily mitigated. 16:44

6
7 **END OF SUBMISSION OF MS. O' LEARY**

8
9 **INSPECTOR:** Thank you, Ms. O' Leary.
10 How many more speakers are 16:44
11 you going to present in this module?

12 **MR. O' NEILL:** I have five more papers.
13 I am not going to get them
14 finished today obviously, but we are moving slightly
15 quicker. I was going to now deal with maritime 16:44
16 archaeology.

17 **INSPECTOR:** I was just wondering
18 whether we should allow
19 questions because on Monday I intend to do the ecology
20 modules and we will be breaking anyway and I think it 16:45
21 would be unfair to expect people to remember everything
22 for Tuesday.

23 **MR. O' NEILL:** So be it. After the
24 maritime archaeology it may
25 be an appropriate place to break, but I am in your 16:45
26 hands. That paper will probably take 15 minutes to
27 deliver. If more questioning time is required than
28 that perhaps this is the appropriate time.

29 **INSPECTOR:** Okay. We will go with the

1 mari time archaeology.

2 MR. O' NEI LL: That paper is going to be
3 presented by Donal Bol and.

4
5 MR. DONAL BOLAND ADDRESSED THE ORAL HEARING AS FOLLOWS

16: 45

6
7 MR. BOLAND: Mr. Inspector, my name is
8 Donal Bol and. I proposed
9 to read a shortened version of my statement.

10 I produced some additional maps and charts for

16: 45

11 clari fication in the statement. My name is Donal

12 Bol and, I am a mari time archaeol ogi st and I hold a

13 Di ploma in Archaeology from the National Uni versi ty of

14 Gal way and a Di ploma in Mari time Archaeology from the

15 Uni versi ty of Ul ster Col erai ne. My area areas of

16: 46

16 expertise are mari time archeol ogi cal geophysi cs and

17 mari ne geophysical data analysi s and interpretati on.

18 I have been i nvolved in the compi lati on of a number of

19 Envi ronmental Impact Statements for a wide range of

20 devel opments i ncl udi ng bri dge crossi ngs, pi pel i ne

16: 46

21 crossi ngs, harbour devel opments, mari nas, mari ne wind

22 farms and channel dredgi ng. I have conducted mari time

23 archaeol ogi cal research proj ects i n conj uncti on wi th

24 the Uni versi ty of Ul ster Col erai ne and St. Andrews

25 Uni versi ty Scotl and.

16: 46

26
27 Before becomi ng a mari time archaeol ogi st, I worked in a
28 mul ti nati onal fi rm as a seni or engi neeri ng manager. My
29 servi ces i nvolve an i nvesti gati on of the i mpacts of

1 marine and coastal developments on all identified and
2 potential submerged and buried maritime archaeological
3 remains.

4
5 The purpose of my evidence is to provide an overview 16: 47
6 of: The intertidal and maritime geophysical surveys
7 conducted at and adjacent to the site of the marine
8 structures of a proposed by liquefied natural gas (LNG)
9 terminal at Kilcolgan Lower, Co. Kerry; the results and
10 interpretation of data derived from these surveys; the 16: 47
11 perceived impacts and recommended mitigation measures
12 appropriate in light of my findings and my response to
13 submissions made by third parties.

14
15 Moving to page 3. Involvement in the project, 16: 47
16 introduction. I was retained by Sheila Lane &
17 Associates to carry out an investigation of known and
18 potential maritime archaeology and produce a related
19 section for the EIS of the proposed Shannon LNG
20 terminal development. I conducted the following phases 16: 47
21 of the assessment as part of the scope of works:

22
23 A review of baseline environmental context and cultural
24 history. Moving down.

25 16: 48
26 An initial site investigation report (conducted in
27 October 2006, Licence No. 06R163 and Licence No.
28 06B071) which detailed the baseline information for the
29 site, while the final development plans were still

1 being formulated. Moving down to the bottom of the
2 page.

3
4 Following on from the production of a final scheme for
5 the site, a final maritime archaeological report was
6 produced in April 2007, licence No. 07R0048. 16: 48

7
8 Moving on to page 4. The pre-development intertidal
9 and geophysical surveys were conducted under licence
10 with guideline and acquisition parameters as 16: 48
11 recommended by the Maritime Unit of the Department of
12 the Environment, Heritage and Local Government under
13 licence numbers already stated. Upon completion of the
14 assessment, I was involved in the compilation of the
15 section of the EIS dealing with maritime archaeology. 16: 49

16
17 **Main Findings.** During the final maritime
18 archaeological assessment of the area (April 2007), two
19 features (anomalies 1-2) were identified from the
20 intertidal area at the location of the proposed 16: 49
21 development at Ballylongford, Shannon Estuary, Co.
22 Kerry. Reference table 1 and table 2 of this document.
23 The features, a van and a small boat/cleared foreshore
24 (detailed in October 2006 report, anomalies 1-5) are
25 interpreted as being non-archaeological. The initial 16: 49
26 site investigation survey 2006 identified a further six
27 intertidal features; three of which (numbered 6-8) have
28 archaeological potential and have been identified as
29 the remains of a fish trap and peat deposits indicating

1 a prehistoric landscape. Refer to table 2 of this
2 document. The final scheme is remote from these
3 features. They will therefore not be directly impacted
4 by the proposed development and they were not included
5 in the report of 2007. 16: 50

6
7 Moving on to page 5. No magnetic anomalies were
8 identified during the marine geophysical surveys at
9 Ballylongford. During the final marine archaeological
10 survey of the area in 2007, Licence No. 07R048, 12 16: 50
11 features were interpreted from the high resolution
12 site-specific side-scan sonar survey, reference table 4
13 of this document. All but one of these 2007 anomalies
14 S8 is interpreted as being non-archaeological, i.e.
15 drag marks and artefacts from engineering 16: 50
16 investigations at the site. During the October 2006
17 survey, seven side-scan anomalies were identified,
18 reference to table 3 of this document. Side-scan
19 anomalies four to seven were interpreted as manmade
20 features, which may have archaeological potential. 16: 51
21 They are, however, likely to be debris from fishing
22 vessels or shipping in the Shannon Estuary.

23
24 Moving down to potential impacts. The final scheme for
25 the proposed development avoids the 2006 intertidal 16: 51
26 anomalies numbered 6 to 8. They will therefore not be
27 directly impacted by the proposed development. 2007
28 side-scan sonar anomaly S8 is an anomalous feature
29 unlikely to be of archaeological significance as debris

1 from fishing and shipping common place in a busy
2 estuarine area. If archaeological potential does exist
3 at this site the distance of the features from the
4 proposed development (at least 130 metres) east is
5 likely to limit any direct impact. 2006 side-scan
6 anomalies 4 to 7 were interpreted as manmade features
7 which may have archaeological potential. They are,
8 however, likely to be debris from fishing vessels or
9 shipping in the Shannon Estuary. If archaeological
10 potential does exist at these sites, the distance of 16: 52
11 the feature from proposed development (at least 100
12 metres west) is likely to limit any direct impact.

13
14 **Mitigation Measures.** The 2006 intertidal anomalies 6
15 to 8 will be protected by avoidance. An exclusion zone 16: 52
16 of 50 metres will be established around the features
17 during the construction phase of the development. The
18 2007 side-scan sonar anomaly S8 will be protected by
19 avoidance. A seabed impact exclusion zone of 50 metres
20 will be established around the feature during the 16: 52
21 construction phase of the development. 2006 side-scan
22 sonar anomalies 4 to 7 will be protect by avoidance. A
23 seabed impact exclusion zone of 50 metres will be
24 established around the feature during the construction
25 phase of the development. 16: 53

26
27 Archaeological monitoring may be required for some of
28 the offshore construction phase depending on the
29 engineering method chosen for construction of the two

1 jetties on the surface water outfall pipe. Once the
2 construction engineering strategy is finalised the
3 maritime unit of the Department of the Environment,
4 Heritage and Local Government should be consulted in
5 order to establish the requirement for the methods for 16: 53
6 archaeological monitoring.

7
8 Moving forward past the area of the tables dealing with
9 response to submissions to An Bord Pleanála.

10 Submission: The Department of the Environment L051 16: 53
11 raised concerns relating to the difference between the
12 archaeological findings of the intertidal survey and
13 the side-scan survey report submitted in 2006 and 2007;
14 mitigation with respect to secondary or passive
15 impacts; recommendation for diver survey along the 16: 54
16 footprint of the proposed jetties; a recommendation
17 that all archaeological materials and deposits that
18 were identified during the 2006 survey should be
19 included and assessed as part of the overall
20 assessment. This should include mitigation measures. 16: 54

21
22 **Response:** Because there is a number of those I will go
23 through them individually, the first one being the
24 difference between the archaeological findings of the
25 intertidal survey and side-scan sonar survey reports 16: 54
26 submitted in 2006 and 2007. The number and position of
27 side-scan sonar anomalies for the 2006 site
28 investigation differs from the survey for 2007 as the
29 results are based on different data sets. The data set

1 provided by Irish Hydrodata Services Ltd. through the
2 client covering a much wider area around the site and
3 the 2007 data set covering the area and adjacent to the
4 proposed marine development. Just to clarify on that.
5 The original site investigation covered a very wide 16: 55
6 area whereas the surveys conducted in 2007 covered by
7 myself covered the areas of the jetties producing two
8 completely different data sets.

9
10 Similarly the intertidal data submitted in the 2007 16: 55
11 report relates to the area of the proposed marine
12 development while the data submitted in 2006 report
13 covers a wider area of survey.

14
15 The submission: Mitigation with respect to secondary 16: 55
16 or passive impacts.

17
18 It is not envisaged that secondary impacts arising from
19 the construction of the marine and foreshore elements
20 of this development will impact the features revealed 16: 56
21 by the surveys conducted in 2006/2007 due to their
22 distance from the proposed development.

23
24 It is not envisaged that the operation of the proposed
25 facility will impact on features revealed by the 16: 56
26 surveys conducted in 2006 and 2007.

27
28 Looking at possible passive impacts or secondary
29 impacts, I looked at the discharge from the outfall.

1 The discharge being taken into consideration were
2 chlorine level and temperature and looking at the
3 modelling this is minimal at a distance of 50 metres
4 from the point of discharge so that features are
5 protected by avoidance, the distance from discharge 16:56
6 being greater than 15 metres.

7
8 The other impact we looked at was propeller wash
9 affecting features identified as potential archaeology.
10 The draft of the ship (propeller level) is given as 16:56
11 twelve metres. The features identified are at depths
12 of 20 metres and they are mitigation protected by
13 distance from scour source.

14
15 Again a submission: Recommendation for diver survey 16:57
16 around the footprint of the proposed jetties.

17
18 Response: I recognised that diver survey is an option
19 for further investigation at the proposed jetty sites.
20 However, it was not recommended within the report that 16:57
21 no features of archaeological potential were noted
22 during the side-scan surveys of the footprint of the
23 jetties.

24
25 Submission: Recommendation that all archaeological 16:57
26 materials and deposits were identified during the 2006
27 survey should be included and assessed as part of the
28 overall impact assessment. This should include
29 mitigation measures.

1
2 Response: All features identified as archaeological or
3 potential archaeological by way of the surveys
4 conducted at and adjacent to the proposed marine
5 development site have been included and will be 16: 58
6 protected by way of a 50 metre seabed exclusion zone.
7 I reference here the charts and if you look at the
8 first map it shows you the features which were located
9 during the surveys and the assessments. The second map
10 indicates the proposed development with respect to the 16: 58
11 location of the features and the third map shows the
12 features and the proposed exclusion zone around those
13 features for protection with respect to the
14 development.

15 16: 58
16 Submission: Kilcolgan Residents Association (L054)
17 states that all archaeological sites should be
18 protected.

19
20 Response: The proposed mitigation measures will 16: 59
21 achieved this outcome with regard to the underwater
22 archaeological features.

23
24 **Conclusion:** The surveys conducted at and adjacent to
25 the site of the proposed maritime development revealed 16: 59
26 a number of foreshore and seabed features. These
27 features which have been identified as being
28 archaeological or potentially archaeological will be
29 protected by avoidance with a 50 metre seabed exclusion

1 zone being established around each feature.
2
3 Archaeological monitoring may be required for some of
4 the marine construction phase depending on the
5 engineering method chosen for construction of the two 16:59
6 jetties and the surface water outfall pipe. Once the
7 construction engineering strategy is finalised, the
8 maritime unit of the Department of the Environment,
9 Heritage and the Local Government will be consulted in
10 order to establish the requirements for the method for 16:59
11 archaeological monitoring.
12
13 Accordingly, I am of the view that the potential
14 impacts from the proposed LNG terminal development in
15 terms of features revealed by the surveys conducted at 17:00
16 and adjacent to the proposed development will be
17 insignificant.
18
19 **END OF SUBMISSION OF MR. BOLAND**
20 17:00
21 **INSPECTOR:** Thank you, Mr. Boland. Can
22 I just clarify you don't
23 carrying out a diver survey?
24 **MR. BOWDOIN:** Diver surveys may be
25 required when we move to 17:00
26 the monitoring phase of the development.
27 **INSPECTOR:** Do people have questions
28 for the last speakers?
29

1 MR. DOWNEY: Mr. Inspector, I would just
2 like to make some comments
3 on the recent submissions from LNG. First, if I might
4 deal with the underwater archaeology. Just overall
5 I want to compliment both the archaeologists on their 17:00
6 reports. They are splendidly produced and you address
7 all my concerns marvelously. I want to just put it on
8 record here, Chairman, with regards to a matter that
9 you raised concerning a diver survey. In 1520 there
10 had been a naval battle off Ardmore Point between the 17:01
11 merchants of Galway and the merchants of Limerick, a
12 trade war that went to blows. We know that in the
13 various reports in State papers of Henry VIII that at
14 least two ships went down. Given of course the
15 movement of currents etc in the river there may not be 17:01
16 anything there, but I think that it's something to be
17 observant of, that there may be some late medieval
18 shipping or artefacts that could come up in a diver
19 survey, particularly in silts etc. or gullies under
20 water so just to highlight that as a possibility and it 17:02
21 needs to be noted.
22 As regards the potential sites etc. for excavation,
23 that's all marvellously covered again and of course
24 this is the legal requirement anyhow by the state for
25 an archaeological survey before construction begins and 17:02
26 excavation and that is very well catered for.
27
28 Chairman, just for the record I noted that all the
29 experts from LNG gave full details of their

1 qualifications, perhaps I was being a little too shy or
2 moderate in my own self-introduction at the beginning,
3 but just for the record I would just like to put it
4 here I hold my Ph.D. from Cambridge in 1994 in Legal
5 and Diplomatic History. In 2002 I was made a member of 17:02
6 the EU India Think-Tank on Energy and Security
7 Cooperation. We are looking at the uses of total
8 fusion nuclear power so those of you who might have
9 worries that I might be some sort of environmentalist
10 fundamentalist. You may rest assured that I am opposed 17:03
11 to any form of industrial development provided of
12 course that it meets all the criterion for health and
13 safety and protection of the environment and its
14 heritage.

15
16 I am a member of Europa Nostrum, the EU Heritage
17 Foundation and I have been involved in issues
18 concerning heritage most notably recently with the
19 preservation of the Rice House in Dingle and this
20 brings me a point here, but it's really a matter that 17:03
21 has to be addressed to Kerry County Council with
22 regards to the listings of buildings. Here I would
23 like to return to my earlier submission which was
24 specifically focussed on Rallapane House. As far as
25 I know to date it hasn't been formally listed by Kerry 17:04
26 County Council as a special heritage status house, but
27 the County Council are in the process of updating their
28 listings in this regard in the light of what had
29 happened in Dingle over the Rice House issue, they did

1 make it a special heritage designated status so that's
2 a matter of course for Kerry County Council to deal
3 with, but I would just like to have it observed and
4 noted in the record.

17:04

5
6 Going back to, if I may, Thomas Burns, your statement
7 of evidence there. Again I wish to compliment you on
8 your splendid portrayal and you addressed all the
9 issues concerned. Again I just want to refer back
10 there to the issue of screening or earth modelling
11 etc., earthworks. Again with regards to Rallapane
12 House there is a proposed location of a tank within 400
13 metres of the house. Now, I know that there are issues
14 concerning the ownership of property and whether or not
15 an earth mount could be constructed, and I know that
16 LNG have made it clear that they would be willing to
17 come to some arrangement with the Musgrave family with
18 regards to screening etc., but in your opinion is it
19 possible to raise the height of the earthworks, earth
20 modellings at all to maximise or to further maximise
21 indeed the visual impact of the tanks?

17:04

17:05

17:05

22 **MR. BURNS:** What I would say is that
23 given the topography and
24 the site boundary as we have it at present, the
25 screening provided for with a lowering of the tanks and
26 a lowering of the base provides the maximum visual
27 screening that can be achieved on the site at the moment.
28 In terms of considering additional earthworks or
29 screening outside of that then that's a separate issue

17:06

1 that I haven't considered. Obviously if there is more
2 elevation and more earth bunding then that would
3 further reduce the visual presence.

4 64 Q. **MR. DOWNEY:** Right, but it is possible
5 you think that it could be 17:06
6 done theoretically?

7 A. **MR. BURNS:** Not within the existing
8 site boundary.

9 65 Q. Then that would be a matter for discussion with the
10 owners of the other side of the boundary? 17:06

11 A. Correct.

12 66 Q. **INSPECTOR:** Is it appropriate in any
13 way that you would make an
14 offer in that regard?

15 A. **MR. BURNS:** What I would say is that 17:07
16 I think it is
17 significant -- I think it has been demonstrated and
18 I think from my presentation I was showing the
19 significant measures that were proposed on the site as
20 we have it at the moment. Either way we are not going 17:07
21 to screen these tanks from view, these tanks will be a
22 visual presence on this site and in many ways the less
23 intervention we do, additional intervention we do on
24 the landscape, then the more the existing ridgeline
25 stays within its natural context. Berms themselves can 17:07
26 look very odd particularly if they are very steep or
27 unnatural looking features in the landscape and in any
28 case two or adding three more metres of screening on
29 the top of Rallapane ridge is not going to appreciably

1 reduce the visual presence of what remains of the tanks
2 from the proposed level at the moment.

3 **INSPECTOR:** Dr. Downey, have you
4 completed what you want to
5 say? 17:08

6 **MR. DOWNEY:** Thank you very much.

7 **INSPECTOR:** Could we have An Tai sce
8 next please.

9 **MS. McMULLIN:** I would like to concur very
10 much with what Declan 17:08
11 Downey have been saying. I found by experience over
12 the years that good planting on top can be a very
13 effective way of screening. The other thing I have
14 noticed is, just as the Applicant has said, that too
15 much screening doesn't look right either and that very 17:08
16 often even a scattering of trees with spaces between
17 can break up the line and make all the difference to
18 the appearance of the development. I would like also
19 to ask, we were handed out a photomontage view 3 which
20 shows the tanks rising up over the hill top, I wonder 17:09
21 maybe if Mr. Burns would give us an estimate just in
22 metres how much of the tanks are visible at that point?

23 **MR. BURNS:** View 3 is figure 5.3.3(b)
24 in the EIS.

25 **MS. McMULLIN:** Yes. 17:10

26 **MR. BURNS:** In this montage all four
27 tanks are visible with the
28 most western tank being the most obvious and the most
29 elevated over the ridge. I would say in that instance

1 approximately 50% of the tank is visible, of the
2 actually cylinder of the tank is visible. As you move
3 across to the right it probably reduces down to
4 probably 20% so there is somewhere in the order of 25
5 metres of the tank visible on the left-hand tank, maybe 17:10
6 10 on the right-hand tank.

7 **MS. McMULLIN:** Thank you very much. Just
8 one other comment I would
9 like to make and again it's to back up what Declan has
10 said about Rallapane House. In the Kerry County 17:10
11 Development Plan we have a relatively small number of
12 houses listed and far fewer than should be listed.
13 I am talking of getting enough information and getting
14 them into the plan. I know that the Local Authority
15 would have to see as many of possible buildings of 17:11
16 merit protected in this way and I know An Taisce over
17 the years have given them lists and yet we keep
18 discovering more and more so I would hope as the
19 Development Plan is being reviewed, and I gather we
20 don't even have to wait for a full review of the plan, 17:11
21 there can be houses added in during the lifetime of the
22 plan as well so I would hope that the Local Authority
23 would bear that in mind when they are upgrading the
24 list of houses. Thank you.

25 **INSPECTOR:** Did somebody say that the 17:11
26 NIAH had not listed
27 Rallapane House?

28 **MS. O' LEARY:** Yes, the National Inventory
29 of Architectural Heritage

1 doesn't list Rallapane House.

2 67 Q. **INSPECTOR:** Is there a significance in
3 that?

4 A. **MS. O' LEARY:** This survey was carried
5 out, it was published in 17: 12
6 2002, but it was carried out under the direction of the
7 Department of the Environment, Heritage and Local
8 Government and its function would be to assess the
9 built environment and then provide that information to
10 the County Development Plan with a view to listing 17: 12
11 certain structures that they felt were historically or
12 architecturally significant. It just isn't in that.

13 **INSPECTOR:** So that's not definitive
14 one way or the other?

15 **MR. DOWNEY:** If I may, Mr. Inspector, 17: 12
16 I understand that is
17 already considered to be outdated and that a new plan
18 is to be submitted. There are a number of
19 architectural features in various houses in rural
20 Ireland which have been identified as being of 17: 13
21 significance particularly when they are from a period
22 earlier than the 18th century. There has been over a
23 years a blind spot that anything worthwhile preserving
24 had to date from the 18th century and be of specific or
25 typically Georgian character. Rallapane House, like so 17: 13
26 many other or these smaller houses or dwellings of
27 lesser grand or a lesser significance, shall we say, to
28 the houses of the nobility, it's a gentleman's house.
29 It's a country house, it's a manorial house of the 17th

1 century. It has interesting features externally and
2 internally as well and it is part of the local heritage
3 and as I pointed out in my earlier submission it is
4 also the reputed birthplace of a gentleman of Kerry
5 origin who had major significance in European history 17:14
6 in the late 17th century, Bonaventure O'Connor of
7 Kerry.

8 **MS. McMULLIN:** Sorry, I would concur with
9 Declan on that. My
10 experience has been that an awful lot of houses are not 17:14
11 on the official list, but are well worth putting in it.

12 **INSPECTOR:** Okay. Any more questions?

13 **MR. McELLI GOTT:** I would just like to know
14 why are some of the houses
15 being demolished, some of the houses like the O'Connor 17:14
16 house is very close to the main road really, that's my
17 grandmother's house, which dates from about the 1820s,
18 and it's also the ancestral home of Paddy Power by the
19 way, but why is that house being demolished
20 particularly, could anyone answer me? 17:15

21 **MR. O'NEILL:** I think we have the wrong
22 people here at the moment
23 to answer that question, but we will deal with it on
24 Tuesday.

25 **MR. McELLI GOTT:** Okay. 17:15

26 **INSPECTOR:** Any further questions?
27 It's 5:15 so maybe we will
28 break even earlier. I just want to point out to you
29 that sometime next week I hope to draw this hearing to

1 a conclusion and before the conclusion there will be an
2 opportunity for people to make concluding statements.
3 Now, whether you are for or against the development you
4 have to recognise that it's the Board's prerogative to
5 decide to grant permission and in which event you may 17: 15
6 wish to consider what conditions you would wish to be
7 imposed and in that regard I suppose those who are
8 opposed to the development might regard it as making
9 the best of a bad lot so I am just asking you to give
10 that some consideration over the weekend, if you feel 17: 16
11 so inclined.

12
13 I would point out that the conditions should relate to
14 the development site. I know one or two of you are
15 concerned about the pylons which would be necessary for 17: 16
16 making the electrical connections, that's a separate
17 day's work I am afraid. As well as that if permission
18 is granted for this development it will be the subject
19 of a licence from the EPA on integrated pollution
20 control. That means that as far as the operation of 17: 16
21 the site is concerned we cannot impose conditions in
22 relation to pollution control. We can impose
23 conditions in relation to the construction phase in
24 terms of noise emissions, dust, that sort of thing so
25 with that I would just ask you to give that 17: 17
26 consideration and we will see you all again then on
27 Monday at 10 o'clock when I am hoping to do the ecology
28 module so thank you everybody and have a good weekend.

29

THE HEARING WAS ADJOURNED TO MONDAY, 28TH JANUARY 2008
AT 10:00 A.M.

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