Final version

SHADOW SCRUTINY PANEL

DRAFT WATER RESOURCES (JERSEY) LAW 200-

FINAL SUBMISSION ON BEHALF OF THE ENVIRONMENT & PUBLIC SERVICES COMMITTEE

07 October 2004

CONTENTS

SHADOW SCRUTINY PANEL

DRAFT WATER RESOURCES (JERSEY) LAW 200-

[A] INTRODUCTION

1. This Final Submission on behalf of the Environment & Public Services Committee (the Committee) addresses six Issues **all** of which have arisen after the close of the Committee's presentation to the Shadow Scrutiny Panel (the Panel) on the 26th July 2004, namely –

- Dr S Sutton's comments (oral & written) on the "Water Scarcity" Issue
- The "Water from France" Issue, which was raised by the Water Diviners / Drillers during the Afternoon Session on the 26 July 2004
- The Letter from the Chairman of the Panel to Senator Ozouf (President of the Committee) dated 28 July 2004
- The Technical Report by Entec UK Ltd dated 30 June 2004 and the Addendum thereto dated 12 July 2004, copies of which were not supplied to the Instructing Team until early August 2004
- The Further Letter from the Chairman of the Panel to Senator Ozouf dated 10 August 2004
- The Letter from the Acting Chairman of the Panel to the Jersey New Waterworks Company Limited (JNWC) dated 10 August 2004 and JNWC's reply dated 17 August 2004 appertaining to the operation of the Desalination Plant.

[B] THE WATER SCARCITY ISSUE

2.1 At the end of the Morning Session on the 26 July the President tabled a document, which demonstrated that Jersey would sit in 11th place in the World in terms of its scarcity of water. It was explained at the time that the document had been prepared in accordance with recognised criteria and that it was supported by JNWC.

2.2 During the Afternoon Session Dr S Sutton (the Panel's Technical Advisor) was invited by the Panel to comment on the validity of that document. He sought to dismiss it as being irrelevant on the grounds

that, in his view, it would be inappropriate to compare a small Island such as Jersey with large countries such as the UK. He did, however, proceed to explain that if Jersey were compared with "**East Anglia**" (especially on a county by county basis) it would be found that the Anglian Region was in a **worse position than Jersey** in terms of scarcity of water. The Instructing Team were very concerned to hear Dr Sutton express that opinion. Consequently, they subsequently obtained **independent** advice from a highly respected expert in the UK specifically on that point, namely from a Mr David Evans OBE M.Sc, FCIWEM, MICE (who was formerly the Water Resources Manager for the Anglian Region of the Environment Agency and its predecessors and as such very well placed to advise on the matter). Mr Evans has also made a comparison between Jersey and the Southern (South East) and South West Regions of England in view of their proximity to Jersey.

2.3 Subsequently, Dr Sutton's written Critique (27 July 2004) on the above document was received, in which he makes entirely **new** comments thereon. Again those comments have been referred to Mr Evans for his consideration.

2.4 A short "Note" prepared by Mr Evans is enclosed as Appendix 1 from which the Panel will observe that, even on Dr Sutton's basis, Jersey **is considerably worst off** in terms of scarcity of water, which is even more stark when it is appreciated that Jersey receives **c 40% more rainfall** than the Anglian Region. It is emphasised that, as Mr Evans explains in his Note, particularly water scarce counties in the UK can "import" water from other counties but Jersey does not, of course, have that luxury; instead it has to rely on a Desalination Plant [see further under Section G below].

[C] THE WATER FROM FRANCE ISSUE

Background

3.1 Again during the Afternoon Session on the 26 July, the Representatives from the Water Diviners and Well Drillers told the Panel that a few boreholes (c 50) have been drilled on the Island to considerable depths and that the water, which is under pressure, flows from them to waste. From that the Water Diviners / Drillers sought to deduce that there are **plentiful**, largely unused, resources under the Island in the form of "rivers", which they claim flow from

France and indeed from as far away as the Pyrenees. Anecdotes of experiments that were said to show a connection between France and Jersey and France and the South of England using variously pink dye, iron filings, or ions (depending on the version of the anecdote) cannot be substantiated and have to be put in the category of "urban myth".

3.2 In this connection, the Panel's attention is drawn to (i) pp 81 – 84 of the 1991 BGS 'Lighthouse' Report (ii) p4 of the Groundwater review Group's Position paper of February 1994 (iii) p8 of the 1998 BGS Report and specifically to (iv) pp 10 – 12 of their 2000 Overview Report (copy extracts attached at Appendices II and III) and which are briefly summarised below.

The 1991 BGS Report

4. BGS, in their very first Report identified numerous boreholes on the Island, which were at varying depths of between c 200 – 500 ft; these included –

Location	Depth (Metres)	(Feet)
Atlantic Hotel	76.2	250.7
Silver Jubilee Centre	79.3	260.9
Fort Regent Centre	92.1	303.0
Bistro Frere	109.7	360.9
Jersey Racecourse	128.0	421.1
Lobster Pot	144.8	476.4

The 1994 Groundwater Review Group position paper

Section 2 final paragraph:

" Given these basic geological conditions, the members of the GWRG cannot accept the notion of Streams of underground water. Such a phenomenon cannot exist at depth in Jersey. It is also the reason why water sources outside the bounds of the Island are an irrelevancy. Our water does not come from France."

The 1998 BGS Report

5.1.1 Whilst as was explained to the Panel, Jersey's main source of groundwater is a relatively shallow aquifer at a depth of c 20 – 30 m, it was again stated in their 1998 Report that BGS were **well aware** of the existence of such deeper boreholes; moreover, they were likewise aware that some of those boreholes were "**artesian**" in nature.

5.1.2 However, in respect of those deeper boreholes BGS concluded in their Report that the flow to them is "**relatively limited**" in terms of groundwater volumes. Nevertheless, those known were **included in BGS's Water Balance calculations**.

5.2 BGS did specifically deal in that Report with the proposition put forward by the Water Diviners to the Panel i.e. that Jersey can rely for its water resources on deep underground rivers, which BGS described as "**mystical**" (p 8 footnote 1 refers).

The 2000 BGS Overview Report

6.1 Again BGS acknowledged the existence of deeper boreholes under artesian pressure; indeed they make reference to such a borehole having been logged at **Fort Regent** as far back as **1840** (p 11 refers). The Panel's attention is also drawn to BGS' reference to such a borehole at **Rozel** (p 12 refers).

6.2 More significantly, BGS rejected the contention of the Water Diviners that Jersey's groundwater is supplemented from France, basically for three reasons, namely –

- There is no "**driving force**" that could transport groundwater in that manner
- They demonstrate that using reasonable parameters in their calculations, that it would take about "**57,000 years**" for water to travel across the Bay of St Malo to Jersey
- The **chemistry** of the water beneath Jersey is inconsistent with such a proposition

Report by Environmental Management Consultancy

7.1 A copy of the Report by a UK based Firm of Consultants (Environmental Management Consultancy – "EMC") dated January 2001 was not disclosed to the Instructing Team until August 2004.

7.2 It is noted that the Report was commissioned by **Deputy Gerard Baudains** (a member of the Panel), seemingly on behalf of the Water Diviners & Engineers Association.

8. Having reviewed the BGS Reports (1991 – 2000) **EMC supported the position taken by BGS** in relation to the "Water from France" Issue and concluded –

- "There is no confined aquifer present on Jersey or in the immediate vicinity which could provide a flowpath for groundwater from France" (p 10 refers).
- "It is considered unlikely that there is an additional source of fresh groundwater recharge to the Island from the French mainland" (p 13 refers).

Consideration of the views of the Water Diviners

9. The Committee wish to dispel, hopefully once and for all, the suggestion put to the Panel by the Water Diviners / Drillers that the Environment & Public Services Committee (& its predecessors) and its Technical Advisers have ignored their previous assertions concerning deep water flows. In this connection, the attention of the Panel is drawn to (inter alia) the following –

9.1.1 At page 33 of their 1998 Report, BGS refer to the "dissertations" on the subject by **Messrs Baudains, Langlois & De La Haye**, which BGS had duly considered. Nevertheless, BGS concluded that "**no (technical) evidence to substantiate (their contentions) has ever been presented by the diviners**" (p8 footnote 1 refers).

9.1.2 At pages 10 & 29 of their 2000 Overview Report (in respect of which **Deputy Baudains was a consultee** – p 30 refers), BGS refer to the 1999 Report by the Water Diviners and Engineers Association, which BGS had likewise considered. However, again BGS stated "**there has been little *tangible* evidence presented by the water diviners over the years to support (their) claim**". On the contrary, BGS concluded "That the **scientific** evidence **against** sub- marine

transport of groundwater to Jersey is **considerable**" (p 11 refers).

9.2 Finally, **Deputy Baudains**, as a Member of the Public Services Committee at the time, made a comprehensive "Presentation" **directly** to the Committee on the views held by the Water Diviners on the question of the Island's water resources (Meeting of PSC on 22 May 2000 – Act A14 refers).

[D] LETTER FROM SSP 28 JULY '04

10.1 The evidence available to the Panel includes all the reports produced by BGS since 1989. This includes measurements and data accumulated by the Environment Department, the JNWC, the Centre for Ecology and Hydrology (CEH) whose predecessor (Institute of Hydrology) completed the water balance investigations for the Trinity Catchment and extrapolation to an Island wide water balance estimate.

10.2 Recharge estimates made in the BGS reports **do not exclude any significant inputs**. Particular emphasis has been placed by Dr Sutton on the inclusion of leakages from water supply reticulation systems. But most of the water supply mains in the centre of the Island are relatively new and the majority of the population is located at the coast, close to the groundwater discharge area (to the sea). Mains leakage in these areas has not been included since it will not recharge the substantive part of the aquifer inland. Likewise, "deep waters" from France or elsewhere have not been included in the recharge calculations, since there is at present no scientific evidence to substantiate the existence of water being available from any source, other than rainfall falling on Jersey. However, it has recently been proposed that investigations be carried out to establish the presence, if not quantify, such resources [see further under Section F below]. The Committee and its Technical Advisors would take fully into account any new scientific evidence that is made available from whatever source, as they have always done in the past.

11.1 The overwhelming amount of data currently available (see e.g. Appendix I to the BGS Technical Report WD/91/15. "Hydrogeology and Hydrogeochemical Survey of Jersey", by N S Robins and P L Smedley, 1991) indicates that the **groundwater resources used on**

Jersey are contained in the shallow fractured zones. In that particular Appendix, 108 boreholes are listed with associated physical data obtained from survey work. There are deeper boreholes included within that survey; **so any claim that BGS has not taken these into account is clearly incorrect**. Inspection and analysis of these data lead BGS to infer a conceptual model of a shallow aquifer within variably fractured hard rocks with little storage. Yields measured for all 108 boreholes did not exceed 4.5 l/s and **the majority were found to be below 1.0 l/s**. This does not substantiate the proposition which has been put to the Panel, that there are large or even significant resources currently untapped. But **even if** such resources did exist, it is BGS's contention that those resources have their origin in rainfall falling on Jersey.

11.2 However, there is no scientific / technical evidence that large or significant resources exist at depth. Assertions have been made to the Panel about underground streams with potentially high yields (10,000gph, >12/ls). In the absence of such scientific / technical data, BGS stand by their conceptual model of the hydrogeology of Jersey since it represents, on current data, the most reliable and scientifically sound basis.

11.3 Therefore, the Committee is satisfied that currently the conceptual model and water balance / recharge calculations undertaken by BGS (and CEH) are sufficiently robust to support the need to properly manage and control the water resources of Jersey for both its protection from over abstraction and its equitable allocation. The Draft Law will allow the refinement of these resource estimates by facilitating the gathering of additional data concerning abstraction volumes. In addition to the gathering of such data BGS would advocate the enhancement of the current understanding of Jersey's water resources by the monitoring of groundwater levels and the establishment of a comprehensive borehole/ well database. This would allow for the production of an improved model and consequently the better prediction of possible resource deficits in the future.

Drought Situations

11.4 The Committee does not consider that the promoting of a revised Drought Law is the appropriate way to proceed. Instead, the Committee remains firmly of the view that **comprehensive water resources**

management legislation (in the form of the current Draft Law) is required in Jersey, for the proper management and control of the Island's precious water resources for the benefit of both present and future generations

11.5 But the attention of the Panel is drawn to the special provisions, which have been incorporated into the Draft Law specifically in order to deal with drought situation (Part 4 in the Draft Law refers). However, in the view of the Committee it is **not possible to predict**, with any certainty, the anticipated frequency of drought situations on the Island (and hence when it would be necessary to impose special additional restrictions). For example, "droughts" were encountered during **more than 50%** of the 8 year period 1989 – 1996 (p8 of the BGS 2000 Overview Report refers).

[E] REPORT BY ENTEC 30 JUNE '04 & ADDENDUM 12 JULY '04

Main Report

12. It is acknowledged that the summary of BGS findings presented is fair and reasonable but it should be emphasised that the Committee is satisfied that BGS considered all potential groundwater resources, shallow and deep. It found that none can be sourced from exotic locations and the water available on Jersey derives from rainfall recharge on Jersey. In addition there are a number of specific points raised in the report which are dealt with here.

- Entec appear to have ignored the BGS "Overview Report" (2000) which specifically deals with exotic sourcing of Jersey groundwater.
- The Entec report ignores the dialogue with the Water Diviners (WDEA), which has been continued throughout the investigations. They provided some very useful information. Their views have been listened to and considered but in the absence of supporting scientific evidence they cannot be upheld.
- Anthropogenic inputs to the water balance were considered by BGS in detail. For example water main losses were based on Jersey New Waterworks Company nightline data, not generic estimates.
- The possibility of deep groundwater flow has not been ignored by BGS,

but the scientific data shows that it is of limited volume and only of local, small catchment scale or less significance.

- The relationship between river and groundwater is understood. In all cases the stage of flowing streams is approximately the same as the valley bottom piezometric groundwater head, hence groundwater provides baseflow to the streams. When the streams dry up the piezometric head lies beneath the streambed.

- Pre-1996 water balance estimates were not publicly retracted because the annual and various other reports of BGS have provided the latest updated situation on a year on year basis. This is normal scientific practise. Nothing is hidden or retracted so the growth of scientific understanding can be clearly seen.

Addendum

13.1 In the second paragraph under "Supplemental Evidence", Dr Sutton states "the one EU country **most similar** in scale to Jersey (Luxemburg) does **not** comply with the EU requirement" i.e. that particular country has not, as yet, implemented the Water Framework Directive (WFD). However, what Dr Sutton overlooks is that the EU Commission has instituted proceedings against Luxemburg for its failure to implement the WFD by the due date of 22 December 2003. In the view of the Committee, this would hardly be a good example for Jersey to follow.

13.2 Seawater intrusion or upconing is a fear at St. Ouen's, not from pumping (though since the aquifer is unregulated this might change) but currently from the extension to and increased dewatering from Simon's Sand Pit. Sentinel wells have been installed to monitor any saline water ingress so this situation can be managed before it arrives at the sand pit.

[F] FURTHER LETTER FROM SSP 10 AUGUST '04

Groundwater Review Group

14.1 Reference to the Group of locally based geologists was indeed previously made by the Committee. The Panel's attention is drawn to (inter alia) –

- The Riley Report p 2 para 1 & p 5 para 14
- The Paper by PSC dated 14 January 1994 p 2 (last para)
- In his Closing Remarks to the Panel on the 26 July 2004, the

President specifically referred to "highly qualified **Jersey based** geologists" supporting the conclusions reached by BGS.

14.2 Correspondence and Committee Acts relating to the Groundwater Review Group and the reports produced by this group has been researched by the Scrutiny panel officer and we are grateful to him for sight of this bundle which we assume was also provided to the Panel.

-

20m^3/day "Threshold"

-

15.1 This quantity is derived from the UK's Water Resources Act 1991 (Sect 27).

15.2 However, the above provision was replaced, as from the 1 April 2004, by virtue of the Water Act 2003 (Sect 6). Under the new provision the Secretary of State will be able to vary the "threshold" – by either increasing or reducing the 20m^3/day limit – in order to reflect different circumstances in particular areas of England & Wales. This will be by Statutory Instrument, which is the equivalent of States' Regulations in Jersey. But as yet no such Statutory Instruments have actually been made (although they are expected early next year following the outcome of consultation with stakeholders, which is currently being undertaken by the Environment Agency).

15.3 The Panel have enquired whether other European countries have lower thresholds. Based on the limited research undertaken in the time available, it has been revealed that some countries in Europe do have thresholds lower than in the UK – indeed some have "**zero tolerance**" thresholds (which means that in those countries a licence/ permit is required for **all** abstractions other than for e.g. domestic or livestock purposes). Brief details are as follows

Country	EU	Non EU	"Thresholds" (m ^{3}/day)
Czech Republic	Yes		16
Bulgaria		Yes	10
Estonia	Yes		5 (groundwater)

Albania		Yes	0
Latvia	Yes		0

15.4 As previously explained to the Panel, the "threshold" of $3m^3$/day in the Draft Law (Article 12 (1) refers) was introduced following the consultation process; originally it had been set at $2m^3$/day. This revised limit is considered by the Committee to be appropriate to Jersey's situation. In order to put this limit into the Jersey context, it is useful to consider what the effect would be if the threshold were to be set at say $10m^3$/day (i.e. half of the UK's). This would mean that **250 additional** abstractors would become "exempt" (since 400 licences would be required if threshold = $3m^3$/day, but only 150 if threshold = $10m^3$/day). Consequently, up to 2.5 Mld (250 x $10m^3$/day) additional water could be abstracted without a licence. In the view of the Committee this would represent a significant proportion of the Island's water resources, which would be unlicensed. Therefore, the Committee considers that the proposed figure of $3m^3$/day constitutes the appropriate "balance" between licensing and exemptions, based on current data (but see further under para 15.5 below).

15.5 The Panel is reminded that the proposed threshold of $3m^3$/day can be subsequently amended by States' Regulations, say following operational experience of the Law in practice (Article 12 (4) in Draft Law refers). This approach follows that recently adopted in the UK (see para 15.2 above).

Deeper Sources of Water

16 1 The assertion that BGS has constantly discounted the views expressed by the water diviners and well drillers, namely that "there are ample resources of water at deep levels" is **unfounded**. BGS has on a number of occasions had discussions with and read documentation from the diviners/ drillers. However, after due consideration BGS concluded that there was not substantive scientific data to support the beliefs of the water diviners and well drillers; this still represents the current situation.

16 2 In the view of the Committee the recent submission provided by the diviners / drillers to the Panel is **not evidence of data or fact**. It is

largely a collection of newspaper articles containing unsubstantiated assertions. Consequently, this has not persuaded the Committee that there are substantive "new" and untapped resources available to the people of Jersey to satisfy their current or future water demands.

16 3 The Committee has been advised that in order to prove the existence of any additional substantive exploitable supplies at depth the following requirements would need to be established –

16 3.1 Prove borehole yields from depths greater than say 70 –100 feet below water table. A first step would be to pump test existing boreholes that satisfy this criterion and which the water diviners/ drillers are satisfied are located on their underground streams, and/or

16 3.2 Sink a new, high capacity, borehole to a depth of between 150 – 200 metres, to be located by the water diviners/ drillers and then tested as per para 16.3.1 above

The pumping tests would need to be carried out to international standards under the British Standard Code of Practice BS6316: 1992.

Such a proposal was put to the water diviners/ drillers at a meeting with them on the 31st August 2004, which was chaired by the Committee's Vice-President. To date, however, no offers of appropriate test boreholes have been forthcoming from the diviners/ drillers.

Boreholes below 25m

17. The Committee does **not dispute** the existence of **limited** water resources below 25 metres. However, the Committee has reasonably concluded (based on the best available advice) that the majority of groundwater flow to boreholes and springs takes place in the upward 25 metres of the saturated zone: but this does not mean that there is no groundwater flow beneath that depth. Consequently, the Committee adheres to its original proposition, namely that the Draft Law should apply to **all** groundwater beneath the Island i.e. irrespective of its depth.

BGS's Costs

18. The Committee, whilst being confident that it has obtained good value

for money in procuring the services of BGS, does not consider that the question of the costs paid to BGS, in respect of their work in Jersey, is relevant to this scrutiny process. Such information is clearly outside the Panel's Terms of Reference [Letter from SSP dated 15 April 2004 refers] and would be a matter more appropriate for the Public Accounts Committee.

[G] THE DESALINATION PLANT

19.1 The Letter from the JNWC to the Panel dated 17 August 2004 (copy enclosed at Appendix IV) reveals that –

- The Desalination Plant (the Plant) has been operated on eleven separate periods between 1992 – 2003 (i.e. following the commissioning of the Queens Valley reservoir), of which nine were for **water resources purposes** i.e. because of water scarcity on the Island [see further under Section B above].
- Indeed, JNWC "consider the **primary role** of the Plant to be an alternative water resource".

19.2 Based on current costs (relating to the new Plant, which came into operation in 1999) and the actual usage made of the Plant during the nine periods referred to (amounting to 409 days in total), the Instructing Team understands that the Plant has in fact cost in excess of **£20K per day** to operate. In the view of the Committee, this represents a significant additional cost to the Island of having to address its water scarcity problems and reinforces the urgent need for comprehensive water resources management legislation.

[H] ADDENDUM

20. This Final Submission document was approved by the Environment & Public Services Committee at its meeting on the xx September 2004.

--- /// ---